CHAPTER 2

ELECTRONIC DELIVERY CHANNELS

Introduction
The Information Technology hurricane which has impacted banking globally has also impacted the Indian banking sector and has made this colossus to wake up and embrace the new gift of the millennium for bringing in operational convenience of banking to the door step of the customer. Electronic delivery channels are various technology based means through which the customers can transact their business with the bank at their convenience anywhere and at anytime of the day or night. Thus, customers have the choice of transacting business through different delivery channels offered by banks.

This chapter presents an overview of different electronic delivery channels that are available. Depending on the profile and requirement of customers, banks may selectively offer services to customers through delivery channels. The bank branch is the most traditional delivery channel. Banks in addition to physical branches, put up delivery channels which do not require any human interface to deliver services to customers. Every delivery channel has its own pros and cons which has been brought out clearly in the description of delivery channels.

2.1 Customer Service & Electronic delivery channels
Banking is essentially a service oriented industry. Service is deemed complete only when it is accompanied by satisfaction of customers who avail it. Customer satisfaction and customer protection are the hallmarks of banking service. Regulators and supervisors across the financial world have built policy platforms on strong foundations of consumer protection and customer service.
Due to demanding customers, attributes of customer service are changing for reasons like increase in customer awareness, predominance of customers seeking tangible action to ensure that their rights as customers are upheld, increasing awareness of Banking Ombudsman schemes, redressal of grievances through legal channels, consumer courts etc. Banking penetration through use of technology and the increase in number of non-face-to-face transactions adds a different dimension to the customer care paradigm. These attributes, compel banks to not only live up to contemporary expectations but also look at enhancing skill-sets in information technology, human resources and transactional analysis for meeting future needs. The RBI too has been compelled to lay emphasis on customer service aspects by carving out an entire department dedicated to the subject.

Technology driven solution to customer centric problems may not succeed if customers do not know how to use technology devices making thrust on customer literacy, education and inclusion imperative. Regulators need to propagate the advantages of using paperless instruments, electronic payment systems etc. to gain acceptance from customers after they have transcended barriers of reticence, resistance and technology. Willingness of customers to embrace customer service methods and innovations, level of customer comfort to an advanced technique including technological platforms, and cost that service providers incur to put in place an advanced technique to attract customers are some of the other factors that should be taken into account. For eg. Customers willingly accept with passage of time innovations such as MICR technology, electronic payment systems viz. ECS, EFT, NEFT, NFS, CTS, various types of plastic cards etc. The RBI motivated banks to make use of these products to render better, faster, safer and secure services to customers.

Banks can benefit from information technology to prevent frauds, unique identification of customers for effective adherence to KYC/AML/CFT norms and through risk based transaction monitoring systems in the larger interest
of consumer protection and safeguards. Further, there is a need to integrate technology by banks. The RBI advised banks to implement e-KYC across various customer service points (CSP) through appropriate software solutions which could best integrate UIDAI defined Application Programming Interface (API) protocols. These security features will appeal to the customers psyche and attract them to banking innovations. With the benefits of technology to speed up ease of access of customers to service providers, permit easier communication and also speed up operations, there is no better option available for banks but to adopt electronic delivery channels.

“Delivery channels are various technology based means through which the customers can transact their business with the Bank at their convenience anywhere and at anytime of the day or night”. [2] Thus, customers have the choice of transacting business through ATM, Internet Banking, Telebanking, Mobile banking or through plastic cards such as Credit Card, Debit Card Smart Card etc.

In tune with various needs of the customers, different channels for delivery of service have evolved. Choice of delivery channels depends on several factors such as:

- Convenient time as ATMs, Telebanking, Internet Banking and mobile banking are available round the clock. ATMs must be accessible 24X7. Likewise Internet Banking and Mobile banking must be accessible 24x7.
- Delivery channels should be easily accessible to customers. For eg. the ATM location must be spread across the area of operation for easy accessibility. These channels can be accessed at multiple locations, including overseas locations.
- Delivery channel technology should be user-friendly. Customer should feel comfortable with the technology. The technology should have simple process for authentication and verification. Channels could have
instructions in regional language, use biometrics, special facilities for the physically handicapped etc.

- All efforts must be made to ensure that service levels are met at all times to build customer confidence over a period of time. For eg. managing cash replenishment to ensure ready availability of cash at all times is of utmost importance in ATM management. Cash management is essential when there are continuous bank holidays. Where the difference between peak and lean periods can widely vary. Care must be taken to ensure that customer should not have conflicting experiences across various channels.

- Bank should provide integrated platform that can accept information from various other platforms used by various product groups of the Bank. For eg. The balance in the account should be correctly displayed when requested through any delivery channel.

- Channels must continuously offer to customers increased services for eg. Mobile top-ups, purchase of railway tickets, investment in mutual funds, payment of bills through ATMs etc.

- Customer education on delivery channels is necessary. Customers need to be educated on topics like channel potential, channel usage through hand-holding atleast for the initial period. This improves confidence of the customer and induces them to use the channel.

- Continuous improvement to remove customer inconvenience by following simple “don’t do’s” need to be followed by banks. For eg. avoiding calls at odd hours, avoiding mobile alerts at odd hours, process and systems improvements for reducing prolonged wait times at Phone Banking.

- Seamless service integration between the front-line (branches/Phone banking) and back-office (operations units) is essential. Integration with back-end to deliver a one-bank experience to the customer across various channels, across various product lines is required. For managers to function in an informed environment there is need to create a single view
of the customer across channels. This will enable the manager to act in a
more proactive manner.

Bank management is keen on implementation of delivery channels for
various reasons such as:

- Bank can deliver the services simpler
- Bank can deliver the services faster
- Bank can acquire new customers
- Bank can retain existing customers
- Bank can keep customers highly satisfied on the services provided
- Bank can lower operational costs and transaction processing costs
- Bank can have a wider customer base regardless of geographies
- Bank can improve profitability

2.2 Different Delivery channels for service delivery

2.2.1 Automated Teller Machine (ATM)
The history of ATM can be traced back to the 1960s, when the first ATM
machine was invented by John Shepherd-Barron. It was on this day that the
first “Cash Machine” colloquially called “Hole on the walls” described as
“Mini Banks” was made available to customers outside the branch premises.
It was designed to give access to customers to access cash 24 hours a day.
As per the Wikipedia Encyclopedia, this machine was used by Barclays
Bank (Barclays Bank in Enfield Town in North London, United Kingdom)
on 27 June 1967. In India, HSBC was the trend setter and put up the first
ATM machine in 1987. Table 2.1 presents the growth of ATMs between
2009-2011.

Table 2.1 : Growth of ATMs of Scheduled Commercial Banks

<table>
<thead>
<tr>
<th>SN</th>
<th>Bank Group</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PSBs</td>
<td>15,938</td>
<td>19,702</td>
<td>24,836</td>
</tr>
<tr>
<td>2</td>
<td>SBI Group</td>
<td>11,339</td>
<td>20,978</td>
<td>24,651</td>
</tr>
<tr>
<td>3</td>
<td>Old Private Banks</td>
<td>2,674</td>
<td>3,390</td>
<td>4,126</td>
</tr>
<tr>
<td>4</td>
<td>New Private Banks</td>
<td>12,646</td>
<td>15,075</td>
<td>19,525</td>
</tr>
<tr>
<td>5</td>
<td>Foreign Banks</td>
<td>10,54</td>
<td>1,026</td>
<td>1,367</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>43,651</td>
<td>60,171</td>
<td>74,505</td>
</tr>
</tbody>
</table>

Table 2.1 reflects the growth of ATMs in scheduled commercial banks in India between 2009 - 2011. Nationalized banks had the highest share of ATMs in 2009 and 2011. SBI group had the highest number of ATMs in 2010. Foreign banks had the least number of ATMs.

Rose (1999) cited by Moya, describes ATMs as “an ATM combines a computer terminal, record – keeping system and cash vault in one unit, permitting customers to enter the bank’s book keeping system with a plastic card containing a Personal Identification Number (PIN) or by punching a special code number into the computer terminal linked to the bank’s computerized records 24 hours a day”. [4] As competition amongst banks increase, and also several modes of delivery for banking products and services increase, ATMs have become an important issue, not only in retaining customers but also gaining a competitive edge while maintaining growing overall profitability.

### 2.2.2 Classification of ATMs

ATMs can be classified by their functions or ownership and models. Cash Dispensers, full function ATMs and Cash recycling machines are the three basic types of ATMs. ATMs when classified according to their ownership include owned ATMs, shared ATMs and white label ATMs. Similarly there are three ATM models viz. Wall mounted, lobby type and Drive–in type.

A cash dispenser is defined as “a computerized device outside a bank that supplies cash or account information when the user inserts a cash card and keys in an identification number”. [5]

Full-function ATM machine offers cash dispense, cash and check deposits and a range of revenue-generating services. It gives the widest range of upgrade options and can be extended to offer the largest cash dispense capacity. [6]
Cash Recycler is a teller cash recycler that automates cash handling at the
teller line. These teller cash recyclers are capable of accepting and
dispensing numerous denominations and multiple currencies. They are
designed to improve the productivity of the teller’s role, speeds up
transactions, reduce wait times and improve customer interaction.\(^7\)

In order to enhance the image of banks amongst customers, banks opt for
their own ATMs which are referred to as owned ATMs.

2.2.3 Types of ATMs\(^8\)
There are five types of ATMs which are described:

- **Onsite ATM** is situated either within the branch premises or in very close
  proximity of the branch.
- **Offsite ATM** is located at other places, such as shopping centers,
  airports, railways station and petrol stations.
- **Worksite ATM** is located within the premises of an organization. It is
  often meant only for the employees of the organisation.
- **Cash dispenser** permits to only withdraw cash, balance check and obtain
  mini statement. Customers cannot deposit cash or cheques.
- **Mobile ATM** refers to an ATM that moves in various locations for the
  convenience of customers. Few banks like Bank of Baroda have
  introduced ATM on wheels or mobile ATMs.
- **ATMs available today** are voice-enabled and Braille–enabled so that
  deaf/visually impaired people can easily operate them.

The leading ATM manufacturers in India are NCR, Diebold, AGS, Wincor
Nixdorf and the leading ATM cards which are used to subscribe to services
are Visa (verified by VISA) or Mastercard World Wide respectively.

2.2.4 ATM Networks\(^9\)[10][11][12]

In line with the recommendations of the Rangarajan Committee on
Computerization in Banks, in 1997, an attempt was made in the direction of
Indian Banks' Association's (IBA) Swadhan network. This was the first ATM sharing network pioneered by India Switch Company, using the Base24 transaction switch (A Backend Transaction Backbone for ATM Banking). The National Financial Switch was initiated by Institute for Development and Research in Banking Technology (IDRBT) for a nationwide switch called the National Financial Switch (NFS). Dr. Y. V. Reddy, Shri. G. N. Bajpai, and Shri. C.S. Rao dedicated this National Financial Switch to the Nation on August 27, 2004. The intention was to consolidate all the proprietary, bilateral and multilateral ATM networks to a common infrastructure. The switch is a part of the Indian Financial Network (Infinet), a closed-user group communication backbone for the banking and financial sector. The National Financial Switch allows connecting directly to the individual bank's switch or through their shared ATM Network Switches. It is a win-win situation for all the banks and more importantly, for the customers. The Clearing Corporation of India Limited (CCIL) is the clearing and settlement agency for the switch, which also facilitates the NFS Disaster Recovery Site from its premises at Mumbai.

National Payments Corporation of India (NPCI) was incorporated in December 2008. It has been incorporated as a Section 25 company under Companies Act and is aimed to operate for the benefit of all the member banks and their customers. The authorized capital has been pegged at Rs 300 crore and paid up capital is Rs 100 crore so that the company can create infrastructure of large dimension and operate on high volume, resulting in payment services at fraction of the present cost structure. Presently, there are ten core promoter banks (State Bank of India, Punjab National Bank, Canara Bank, Bank of Baroda, Union Bank of India, Bank of India, ICICI Bank, HDFC Bank, Citibank and HSBC). The Reserve Bank of India also issued authorisation to NPCI to take over the operations of National Financial Switch (NFS) from the Institute of Development and Research in Banking Technology (IDRBT) on ‘as is where is basis’ on October 15, 2009. NPCI took over NFS operations from December 14, 2009. The Primary Site for
NFS is located at Mumbai and DR site is located at Chennai. The NPCI website reflects that, the number of members of NFS stood at 147 in April 2013 and increased to 283 in March 2014. Similarly, the number of ATMs were 1,19,000 in April 2013 and increased to 1,64,000 in March 2014. The NFS approved transaction volume was 2,050 lacs in April 2013 and rose to touch 2,490 lacs in March 2014. These figures show an increasing trend in use of ATMs and its growing popularity.

An interbank network, also known as an ATM consortium or ATM network, is a computer network that connects the ATMs of different banks and permits these ATMs to interact with the ATM cards of non-native banks. ATMs are connected through the Visa or MasterCard network that allow customers access their accounts. Shared ATM Network enables bank customers to conveniently access their funds anywhere from any of the participating banks ATMs.

RuPay, a new card payment scheme launched by the National Payments Corporation of India (NPCI), was conceived to fulfill the RBI’s vision to offer a domestic, open-loop, multilateral system which will allow all Indian banks and financial institutions in India to participate in electronic payments. In order to break the stranglehold of Mastercard World Wide and Visa Inc. in the payments space, National Payments Corporation (NPCI) was set up in 2009 as an umbrella institution with the aim of managing all retail payment systems in the country. With this development, banks can issue “Rupay” cards which work on ATMs and biometric micro ATMs.

CashTree is one of the leading shared ATM networks in India with a membership of 14 banks sharing ATMs. CashTree was originally founded in 2003 by five public sector banks viz. Bank of India, Union Bank of India, Indian Bank, United Bank of India and Syndicate Bank.
BANCS was formed in 2004 by several former members of Swadhan. BANCS is the only shared ATM network which permits Cooperative banks as members.

Global Trust Bank (GTB) joined four other leading Banks, namely Punjab National Bank (PNB), Indian Bank, Oriental Bank of Commerce (OBC) and UTI Bank to launch an inter-bank ATM sharing arrangement, named `Mitr`, at New Delhi on October 8, 2003.

Additionally, there is CashOnline, for which Canara Bank is the settlement bank and other members are Central Bank of India, Indian Overseas Bank, UCO Bank & Union Bank of India. The Development Credit Bank Ltd. (DCB) has also tied-up with HDFC Bank for sharing of automated teller machines (ATMs). Corporation Bank, has tied up with Allahabad Bank and OBC, and is also operating another network.

2.2.5 **Advantages of Shared ATM Networks**

The benefits for banks to be part of such shared ATM networks include:

- Banks can extend their geographical reach while providing ATM services.
- Cost savings accrue as cost of operating the ATMs is shared between the banks. The banks need not install any infrastructure, even as they reach out to customers in the remotest corner of the country.
- Participants need not make substantial investments in technology as networks like CashTree, BANCS pass on maximum savings to the participant banks.
- ATM interoperability is that networks will attract more transactions from the member banks due to convenience of locations.
- ATM networks push up ATM usage and enable banks to increase fee based income.
Banks also benefit by sharing a lower infrastructure cost for providing the same services to the customers.

2.2.6 Advantages of ATMs

ATMs provide several benefits to customers and banks. The benefits of ATMs are as follows:

- Increased hours of operation fit client schedules easily as ATMs offer Any Time Money or service as they can be accessed by customers during or before and after banking hours. ATMs offer extended hours of service. Customers have flexible account access which allows them to access their accounts at their convenience.
- ATMs help to minimize manpower requirements as bank personnel are not required to be present for transactions and have more time to serve customers.
- More customers can be reached beyond the branch network.
- More low cost funds are available because ATMs make it easier for customers to deposit savings easily, wherever the facility exists.
- ATMs permit quick transactions. Customers do not have to wait in long lines inside a bank branch.
- ATMs can reduce or eliminate paperwork as the transaction is electronic.
- ATMs enhance privacy of customers.
- Drive through ATMs give added convenience to customers.
- Many research studies suggest that the cost of a transaction done through ATM is much cheaper than doing it through Cashier/Teller in a branch.
- ATMs are capable of offering many services apart from withdrawal of cash. Thus, there is an increasing range of service through the ATM.
- ATMs have become an effective marketing tool where advertisements can be flashed. Banks benefit due to revenue generation.
- ATMs for the visually impaired are accessible to blind and visually impaired people. The keypads at these types of ATMs are equipped with Braille.
Making cash available through the bank’s ATM network is a vital part of satisfying bank customers. The challenge is to optimize total channel cash availability, while minimizing the cost of managing currency. Thus, Currency Management must provide a predictive, proactive, end-to-end service for monitoring and controlling the availability of cash in a network of ATMs.

2.2.7 **ATM Fee Structure**[13]

- Retail ATM fees are paid by the card holders to the card holder’s bank. The fees may be paid periodically or on per transaction basis.
- Wholesale ATM fees are set by networks and are paid periodically to the network. The fees are exchanged between various members of the ATM infrastructure.
- Switch fees are paid by banks to the network for the use of its switch.
- Interchange fees is a payment by the card issuing bank to the ATM owner to compensate the owner for the expense of installing and maintaining the ATM.
- Fees paid to third party service providers mainly depend upon what services they outsource.

2.2.8 **Facilities offered through ATMs to customers**

Facilities offered to customers through ATMs include cash withdrawals, cash deposit, make fixed deposit, utility bill payments, view transactions, stop payment requests, cheque payment status, balance check, mini statement, book / DD request, fund transfer - in self linked accounts, fund transfer - to other bank accounts through NEFT, on-line shopping for tickets, products, services etc., on-line investments in mutual funds, stocks etc., enquiries (products / location of branches / ATM, exchange rates etc.), Other services like PIN change, VISA Money transfer, Prepaid mobile recharge, insurance premium payment, LIC premium payment, register for Mobile /SMS banking, mobile recharge, payment of taxes, booking airline / railway tickets.
It is essential that currency management in ATMs is done properly so as to ensure availability of cash in the ATM. Currency management includes cash replenishment at ATMs, 24 x 7 continuous monitoring of availability of cash, cash EOD on a daily basis.

Many a times customers witness ATM frauds which include card theft, PIN compromise, card skimming, cash trapping, transaction reversal, deposit fraud etc. It is necessary for banks to educate customers about such frauds and the preventive measures must be taken by them to avoid frauds.

2.3 Internet banking [14]

In India ICICI Bank was the first bank to offer internet banking to its customers in 1996. 1999 saw banks like Citibank, IndusInd Bank, HDFC and Times Bank (now part of HDFC Bank) offer internet banking services to their customers. State bank of India started the Internet Banking services in 2001. Other PSB banks like Bank of Baroda, Syndicate Bank, Allahabad Bank etc. followed in the footsteps of SBI.

Essinger (1999) as cited by Moya describes Internet banking as “to give customers access to their bank account via a web site and to enable them to enact certain transactions on their account, given compliance with stringent security checks”. [15] To the Federal Reserve Board of Chicago’s Office of the Comptroller of the Currency (OCC) Internet Banking Handbook (2011) as cited by Moya, describes Internet Banking as “the provision of traditional (banking) services over the internet”. [16]

The Reserve Bank of India published a Report on Internet Banking (Part 1 of 2) in June 2001. Some of the key points regarding Internet banking are as follows:

- Internet is a vast network of individual computers and computer networks connected to and communicate with each other using the same communication protocol – TCP/IP (Transmission Control Protocol/
Internet Protocol). Internet is often and aptly described as ‘Information Superhighway’, a means to reach innumerable potential destinations. The destination can be any one of the connected networks and host computers.

- TCP/IP protocol is insecure because data packets flowing through TCP/IP networks are not normally encrypted. Thus, anyone who interrupts communication between two machines will have a clear view of the data, passwords and the like. This has been addressed through Secured Socket Layer (SSL), a Transport Layer Security (TLS) system which involves an encrypted session between the client browser and the web server.

- FTP or File Transfer Protocol is a mechanism for transferring files between computers on the Internet.

- The most common and basic use of Internet is the exchange of e-mail (electronic mail). It is an extremely powerful and revolutionary result of Internet, which has facilitated almost instantaneous communication with people in any part of the globe. With enhancements like attachment of documents, audio, video and voice mail, this segment of Internet is fast expanding as the most used communication medium for the whole world. Many websites offer e-mail as a free facility to individuals. Many corporate organizations have interfaced their private networks with Internet in order to make their e-mail accessible from outside their corporate network.

- Internet encompasses any electronic communication between computers using TCP/IP protocol, such as e-mail, file transfers etc. WWW is a segment of Internet, which uses Hyper Text Markup Language (HTML) to link together files containing text, rich text, sound, graphics, video etc. and offers a very convenient means of navigating through the net. It uses hypertext transfer protocol (HTTP) for communication between computers. Web documents, which are referred to as pages, can contain links to other related documents and so on, in a tree like structure.
The next in the HTML genre is the Extensible Markup Language (XML), which allows automated two-way information flow between data stores and browser screens. XML documents provide both the raw content of data and the data structure and is projected by its proponents as taking the web technology beyond the limits of HTML.

Wireless Application protocol (WAP) is the latest industry standard which provides wireless access to Internet through handheld devices like a cellular telephone. This is an open standard promoted by WAP forum and has been adopted by world’s all major handset manufacturers.

Security is one of the biggest attractions of Internet as an electronic medium is its openness and freedom. But over the Internet, the dimensions of risk are larger while the control measures are relatively fewer. The key components of such concern are, (i) authentication, viz., assurance of identity of the person in a deal, (ii) authorization, viz., a party doing a transaction is authorized to do so, (iii) the privacy or confidentiality of data, information relating to any deal, (iv) data integrity, viz., assurance that the data has not been altered and (v) non repudiation, viz., a party to the deal cannot deny that it originated the communication or data.

2.3.1 Categories of Internet banking facilities

- **Transactional**
  Fund transfer in India and abroad, IMPS, Receive funds, Send Money Order, Donate online, Pay bills, Quick shopping, Recharge prepaid mobile, DTH connection, data card connection, Ticketing, Loan and Credit card bills payment online, Investments in Mutual Funds, sale or purchase, On line tax payment, Buy Forex, Invest in insurance policy, Trade in shares online, Invest in flexi recurring deposit, Online shopping etc.

- **Non-transactional**
  Viewing recent transactions, Downloading bank statements, Viewing images of paying checks, Get user id for internet banking, Get password for internet
banking, Link accounts, Manage Accounts (bank accounts, Credit Card Accounts, Loan accounts and demat accounts)

2.3.2 **Advantages of Internet Banking**

The advantages that accrue to users of Internet banking are

- **Customer’s convenience**
  
  Internet banking is available 24 X 7 to customers. Customers can access their bank accounts from anywhere once they have internet connectivity. They can do their banking at any time convenient to them.

- **Services**
  
  Banks offering internet banking typically have more robust websites that offer a comprehensive set of features as compared to websites of traditional banks. These websites have tools that can help customers with respect to functional budgeting and forecasting, financial planning capabilities, investment analysis tools, loan calculators and equity trading platforms. In addition, they offer free online bill payments, online tax forms and tax preparation.

- **Mobility**
  
  Internet banking also includes mobile capabilities. New applications are continuously being created to expand and improve this capability or smart-phones and other mobile devices.

- **Transfers**
  
  Accounts can be automatically funded from a traditional bank account via electronic transfer. Most banks offer unlimited transfers at no cost. They also accept direct deposits and withdrawals that the customer authorizes such as payroll deposits and automatic bill payment.

- **Ease of use**
  
  Online accounts are easy to set up and require no more information than a traditional bank account.
Environment friendly

Internet banking is also environmentally friendly. Electronic transmissions require no paper, reduce vehicle traffic and are virtually pollution-free. They also eliminate the need for buildings and office equipment.

2.3.3 Disadvantages of Internet Banking

Internet banking seems like an obvious choice to leave the hassles of traditional money management behind in exchange for it. However, there are potential problems associated with banking over the internet of which customers may not be aware. Some of the disadvantages of internet banking include:

- Bank relationship
  A traditional bank provides the opportunity to develop a personal relationship with that bank. In the same manner the customer gets to know the banker in order to get benefits from the bank. This is called banker–customer relationship which helps the bank get more and more business and the customer to get better service. This is possible as there is direct contact between banker and customer in traditional banking. In internet banking this interaction is very minimal which works as a disadvantage to both.

- Transaction issues
  Sometimes a face-to-face meeting is required to complete complex transactions and address complicated problems. A traditional bank can host meetings and call in experts to solve a specific issue. Moreover, international transactions may be more difficult (or impossible) with some banks. If a customer deposits cash on a regular basis, a traditional bank with a drive-through window may be more practical and efficient.

- Service issues
  Some banks may offer all the comprehensive financial services, such as insurance and brokerage accounts, notarization and bank signature guarantee through branches. These services are required for many
financial and legal transactions. However, these services cannot be delivered through internet banking.

- Security

Banks are subject to the same laws and regulations as traditional banks. Sophisticated encryption software is designed to protect account information but no system is perfect. Accounts may be subject to phishing, hacker attacks, malware and other unauthorised activity.

E – Security Aspects

Adoption of IT in banks has brought in its wake many advantages and disadvantages. Some forms of cyber crimes are:

- Unauthorized Access to Computer System or Network: This activity is commonly known as hacking.
- Stealing Information Contained in Electronic Form: This includes stealing information that is stored in computer hard disks, removable storage media etc.
- E-mail Bombing: e-mail bombing refers to sending a large amount of e-mails to the victim which results in crashing of a person’s e-mail account or mail servers, thereby causing the transactions to fail.
- Data Diddling: This kind of an attack involves altering the raw data just before it is processed by a computer and then changing it back after the processing is complete.
- Salami attacks: The key factor here is to make the alteration which is so insignificant that it will go completely unnoticed in a single case; for example, a bank employee inserts a program into bank’s server which deducts a small amount from the account of every customer.
- Denial of service: This involves flooding computer resources with more requests than it can handle. This causes the resources to crash thereby denying authorized users the service offered by the resources.
- Virus/Worm: Viruses are the programs that attach themselves to a computer or a file and then circulate themselves to other files and to other computers on a network. They usually affect the data on a computer,
either by altering or deleting it. Worms, unlike viruses, don’t need the host to attach themselves to.

- Physically damaging a computer System: This crime is committed by physically damaging a computer or its peripherals.

2.4 **Mobile Banking**[^18]

The report published by the Cellular Operators Authority of India (CAOI) concerns the entry of cell phones into India. The report depicts that in 1992 telecom sector was liberalized in order to bridge the gap through Government spending and to provide additional resources for the country’s telecom target. Participation of the private sector was permitted. The year 1994 saw cellular mobile services being granted by the government of India for the metros of Delhi, Mumbai, Kolkata and Chennai. In 1995, Kolkata was the first metro to have a cellular network.

The Government of India set up in 1997, TRAI for the regulation of telecom sector in India. Subsequently, in March 1999, National Telecom Policy (NTP) was announced. In 2003 CDMA network was launched and in 2004 Broadband policy was announced. The RBI issued operative guidelines for banks for mobile banking transactions in India in 2008.

An advancement in the operating systems of the mobile phones and mobile technology like 2G, 3G, 4G has led to significant change in the way of working of mobile banking service providers. Since the introduction of 2G and 3G, the demand for mobile phone has increased tremendously.

Gupta (2013) describes mobile banking as “Mobile Banking is an application of mobile computing which provides customers with the support needed to be able to bank anywhere, anytime using a mobile device and a mobile service such as Short Message Service (SMS)”.[^19]
Aggarwal (2012) describes mobile banking as “Mobile Banking is simply defined as core banking functionality on a mobile device”.[20]

Mobile banking is gaining popularity among Indians with increasing number of people using this platform to check balances, receive SMS alerts, buy tickets, pay bills, shop online, and transfer funds. “The number of mobile banking transactions doubled to 5.6 million in January 2013 from 2.8 million a year ago. The value of these transactions increased threefold to Rs 625 crore during the month from Rs 191 crore in January 2012.Increase in mobile Banking transactions in India”[21]

2.4.1 **Difference between SMS Banking and Mobile Banking**

SMS Banking is being offered as a convenience banking service where customers can receive information based on SMS requests they place in a specified format. This service can be accessed by any customer having a registered Mobile phone number with the Bank.

On the other hand, mobile banking is an advanced technology service that offers facilities to customers with access to mobile subscription and a mobile handset. Using mobile banking customers can perform many more transactions in a secure and convenient way compared to SMS banking. These include facilities like fund transfer and investments in mutual funds etc.

2.4.2 **Mobile Banking Business Models**[22]

Various mobile/branchless banking models differ on a fundamental matter that who will be responsible for establishing the relationship with the customer. Whether the bank or tele-communication company (Telco) will be responsible for opening accounts, taking deposits, lending etc. Thus, branchless banking can be categorized as follows:
Bank Focused model
This model is a modest extension of traditional branch banking. A traditional bank may use non-traditional delivery channels which may be low cost to provide banking services to customers. The banks may put up ATMs or provide internet banking to customers. As and when possible banks may keep adding new delivery channels.

Bank-led Model
This model offers an alternative to conventional branch banking. In the branch based banking, the customer can do financial transactions through retail agents or (mobile phone) instead of doing it at bank branches or even through bank employees. This model strives to reach services through various delivery channels like retailers/mobiles, trade partner (Telco)/chain store). These channels may have experience and may be cheaper than bank based options.

Non Bank – led Model
In this model the bank is not part of the picture (except that it may be a safe – keeper of surplus funds). The non-bank (Telco) performs all the functions.

2.4.3 Mobile banking services
Mobile banking services can be classified based on the push / pull nature. When a bank sends out information based on rules, it is called “push”. For eg. when banks send SMS alert regarding account balances which go below the threshold level. On the other hand “pull” is when the customer requests information from the bank. For eg. when a customer asks for cheque status or last five transactions, it is a pull based offering.

It is possible to view banking services in another way as transaction based and enquiry based. Request of bank statement can be classified as enquiry based service while a request for fund transfer to another account can be classified as transaction based service. Transaction based services are
different as compared to enquiry based services as they require additional security across the channel from the mobile phone to the bank data servers. These classifications of services is listed in Table 2.2.

Table 2.2 : Classifications of mobile banking services

<table>
<thead>
<tr>
<th></th>
<th>Push</th>
<th>Pull</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transaction Based</td>
<td>▪ Fund Transfer</td>
<td>▪ Account Balance enquiry</td>
</tr>
<tr>
<td></td>
<td>▪ Bill Payment</td>
<td>▪ Account statement</td>
</tr>
<tr>
<td></td>
<td>▪ Other financial services like share trading</td>
<td>▪ Enquiry</td>
</tr>
<tr>
<td>Enquiry Based</td>
<td>▪ Credit / Debit Alerts</td>
<td>▪ Cheque status Enquiry</td>
</tr>
<tr>
<td></td>
<td>▪ Minimum Balance Alerts</td>
<td>▪ Cheque Book Requests</td>
</tr>
<tr>
<td></td>
<td>▪ Bill Payment Alerts</td>
<td>▪ Recent Transaction History</td>
</tr>
</tbody>
</table>

Source : http://rits.infogile.com/pdf/Mobile_Banking.pdf

Mobile Banking can be divided into two broad categories viz. Alert facility (Push based data services) and Request facility (Pull based data services). Mobile Banking alert facility keeps customers informed about the significant transactions in their accounts. It keeps them updated wherever they go. M-banking customer can subscribe for SMS alerts with respect to bank alert, credit card alert and demat alert.

Customers receive a bank alert when salary is credited into their bank account, account is debited by amount specified by customer, account is credited due to cheque deposited in the account is dishonoured, balance above a limit specified by the customer, balance is below a limit specified by the customer, credit card alert, due date reminder which is normally received five days prior to the due date to inform customers total dues and minimum amount of dues and the payment due date, approaching credit limit reminder incase customers credit card falls below 10 percent of total credit limit and to inform customers of available credit limit and the total amount outstanding on the credit card accounts, demat alerts for demat account being
credited or debited, pledge creation and closure on the scrip, rejection of instruction submitted when customers have any issue with their transfer/pledge instructions, materialization/re-materialization when shares have got dematerialized from customers demat account.

In order to receive alerts promptly, the mobile phone number must be registered by customers with the bank. All the customers having saving account, credit card account and demat account can avail this facility. Moreover, to get mobile alerts customers do not require a special phone, a normal GMS/CDMA mobile phone will do. Customers can also access the alerts abroad also by simply subscribing to the international roaming facility.

Mobile Banking requests facility (Pull based data services) enables customers to make queries regarding account information by typing capital letters denoting a request like: ITRAN for last 3 transactions in their account, IBAL for account balance inquiry, IT RAND for transaction status IBILLD for bill details etc.

2.4.4 Technologies behind Mobile Banking

M-banking is based on mobile applications developed on one of the technologies viz. Interactive Voice Response (IVR), Wireless Application protocol (WAP), Short Messaging Service (SMS) and Standalone mobile application clients. Each technology is briefly described.

- **IVR – Interactive Voice Response**

  IVR can be implemented through pre-specified numbers which banks advertise to inform their customers. When a customer makes a call to the IVR number, the customer is greeted with a stored message and is offered a menu of various options. The customer can then press the option number in the keypad. Using a text to speech program, information is read out.
**WAP - Wireless Application Protocol**

WAP and Internet banking use similar concepts. Customers access WAP sites of banks using a WAP compatible browser available on their mobile phone. Banks that offer WAP based channel to permit its customers to do “anytime anywhere” access to secure reliable services.

Fig. 2.1 WAP Network Architecture for Mobile Applications

These services can be enquiry based or transaction based services & complex transactions like trade in securities over the mobile phone.

A WAP gateway needs to be hosted for implementing WAP based service. In order to carry out transactions, mobile application users access the bank’s site through the WAP gateway. This is similar to internet users who access a web portal for accessing the banks services.

**Standalone Mobile Application Clients**

Standalone mobile applications are most suited for implementing complex banking transactions. It is easy to customize them in accordance with user interface complexity supported by mobile. They also make it possible to implement a highly secure and reliable channel of communication. This is most suited for trading in securities. These require to be downloaded on the
client device so that they can be used. While the disadvantage of this application is that it needs to be customized to suit mobile phone on which it is supposed to run, the advantage of mobile application client is that it can implement an end-to-end encrypted secure channel.

Mobile banking provides business and service opportunities like SMS alerts marketing promos, cross selling of mutual funds, insurance products etc., news information and m-commerce.

2.4.5 Services provided through Mobile banking

- Account details which include mini-statements and checking of account history, alerts on account activity, monitoring of term deposits, access to loan statements/card statements, mutual funds/equity statements, insurance policy management, and pension plan management
- Payments and transfers which include domestic and International fund transfers, micro-payment handling, mobile recharging, commercial payment processing, and bill payment processing
- Investment details include portfolio management services, real-time stock quotes personalized alerts and notifications on security prices support, personalized alerts and notifications on security prices support, status of requests for credit, including mortgage approval, and insurance coverage, check (cheque) book and card requests, exchange of data messages and email, including complaint submission and tracking.
- Ancillary services include top up mobile talk time by recharging through the ATM network, refill the prepaid mobile phone through the ATM/SMS, have separate memorandum of undertaking with other telecom companies also and sell this product to earn commission.
2.4.6 **Advantages and Disadvantages of mobile banking** [26] [27]

**Advantages of mobile banking to customers**
- Customers need not stand at the bank counter for various enquiries about their account.
- Customers can save their valuable time and travelling cost in reaching the bank for their financial transactions.
- Mobile services provide information 24x7, anytime, anywhere about customer accounts.
- Customers can pay utility bills on time and avoid paying penalties due to reminder alerts received from the bank.
- Customers can plan funding their accounts based on the cheques issued to various customers, by taking advantage of balance enquiry/account status.
- Cheque book request can be made sitting at their workplace.
- Banks inform owners each time purchases above a certain value have been made on their card. This way the owner is kept informed usage of card and how much money was taken for each transaction.
- Similarly, the bank reminds customers of outstanding loan repayment dates, dates for the payment of monthly installments. Customers are informed that a bill has been presented and is up for payment. The customers can check their balance on the phone and authorize the required amounts for payment. The customers can automatically view deposits and withdrawals as they occur and also pre-schedule payments to be made or cheques to be issued. Similarly, stop cheque payment or issue of a cheque book over mobile phone is also possible.

**Advantages of Mobile banking to bankers**
- Bankers can utilize the time saved by the channel migration of customers to mobile banking for expansion of business through better marketing and sales activities.
Banks can take advantage of the profits by way of commission for cellular companies by selling prepaid talk time through ATMs.

Banks providing mobile banking services can have competitive advantage over those banks, which are not providing this service.

Mobile banking enables banks to reduce cost of courier, communication, paper work etc.

Through mobile banking, banks can drastically cut down costs of providing service to the customers.

**Disadvantages of Mobile Banking**

- Since the customers do not have direct access to the bankers, the banker-customer relationship may get affected.
- Customer’s feelings, complaints and feedback cannot be accessed directly. In such cases senior citizens, High Net Worth Individual (HNWI) customers may remain dissatisfied.
- Security: Mobile users are susceptible to a phishing. While all banking applications require to enter a password or PIN, customers wrongly configure their mobile devices to save passwords, or use insecure password and PINS that are easy to guess.
- Compatibility: Mobile banking is not available on every device. Banks require customers to use a custom mobile banking application only available on the most popular smart phones, such as the Apple iPhone and RIM Blackberry. Third Party mobile banking software is not always supported on all mobile phones. If customer does not own a smart phone, the types of mobile banking that can be done is usually limited. Checking bank account balances via text message is not a problem but more advanced features such as account transfer are generally not available to users entry level mobiles.
- Cost: Network services charges can be unaffordable as customers need to pay for data and text messaging fees. Some financial institutions charge an extra fee for mobile banking services, and customers need to pay a fee
for software. These charges quickly add up especially if customers access mobile banking often.

**Risks of Mobile banking** [28]

- Just as risks are there in other electronic channels, mobile banking as some associated risks as under:
  - Strategic Risk: The launch of m-banking services without proper appraisal of the implications can lead to loss of banks.
  - Technological Risk on account of obsolete technology, inadequate authentication procedures and improper system or device architecture can lead to risks for both banks and customers.
  - Fake messages, SMiShing and Phishing m-banking customers face risk from fake SMS which attempts at eliciting sensitive information from customers. They give an impression that the bank is seeking the information.
  - Unencrypted messages, if the text messages sent through mobiles are not encrypted, hackers can misuse the same by seeking it during information transmission.
  - Mobile Virus: To avoid virus attacks mobiles must be equipped with requisite firewalls, anti-virus software and other security measures. There is always a threat of being affected adversely by Trojans, worms, spywares and malwares.
  - Money laundering through m-banking funds can be transferred from one account to another through mobile phones. Lack of adequate procedures for customer identification can lead to illegal remittances by money laundering.
  - Mobile Phone cloning: This involves duplication of identity of one mobile phone on another. The mobile identification number and electronic serial number of the mobile device are vulnerable to cloning and may be used by another user with malicious intentions. As such there remains a risk of duplicate transactions in mobile banking. It may result
in financial loss to the customers. Banks will certainly lose their reputation as a result.

- **Vishing:** In case of Voice Phishing or Vishing, customers receive an email that requests them to call on a phone number which is fake to reactivate their debit or/and credit cards. If the customers make calls on the fake number, the reception from the other side which is similar to that of the bank call centers, gives instructions. If the customer follows the instructions and reveals debit or credit card details, the fraudster gets access to confidential information.

- **Man-in-the-Middle:** If the fraudster intercepts and alters the message or communication between the customer and the banker and gets access to confidential information it is a dangerous situation.

- **Trojan Silent Breaker:** In the event the attacker gets access to confidential information by capturing images and keeping track of keystrokes through Trojan horses. It can evade authentication procedures and steal financial information of the customer.

2.5 **Telebanking**

Balchandher etc al (2001) as cited by Moya, describes telebanking as “Telebanking (telephone banking) virtual banking, which is essentially the delivery of branch financial services via telecommunication devices where the bank customers can perform retail banking transactions by dialing a touch tone telephone or mobile communication unit, which is connected to an automated system of the bank by utilizing Automated Voice Response (AVR) technology”.

This benefits customers by providing them enhanced convenience, larger access and save their time. It allows customers at access account information and other services sitting in the comfort of the customers home or office at any time of the day. Banks benefit due saving in costs for delivery of services through telebanking. The cost of delivering services through
telebanking is very much lower than delivering services through branch. Telebanking does not offer facility to dispense money as in case of ATM.

2.6 **e-Kiosks**[^30][^31]

“A kiosk is a small physical structure often including a computer and a display screen that displays information for people walking by”. e-Kiosk is a self-service machine that allows customers to complete financial transaction without hassle. More sophisticated kiosks let users interact and include touch screens, sound, and motion video.

There is reduction in congestion at branch offices as customers use e-kiosks for their banking requirements. This leads to improvement of service quality. “The State Bank of India (SBI) kiosk banking system reduces the account opening costs from Rs 200 at a branch office to Rs. 20 at a kiosk terminal. Some banks put retailers in charge of kiosk terminals. Each retailer gains monetary benefits by way of commission. For eg. (SBI) every savings account which is opened earns the retailer Rs 10 and every transaction 0.5% of the transacted amount. The initial setup costs a retailer Rs. 30,000 and the system is ready for use within 24 hours”.

The facilities offered by e-kiosk include deposit into the current and savings account, pay bills (credit card payment, loan payment etc.). Customers can get access to online banking service through e-Kiosk. It is possible to do video conferencing and two-way chatting with call centre representative, provide feedback and enquire products and services, customers can browse bank website.

2.7 **Smart Cards**[^32][^33]

A smart card, typically a type of chip card, is a plastic card that contains an embedded micro-processor chip–either a memory or microprocessor type–that stores and transacts data. This data is usually associated with either value, information, or both and is stored and processed within the card’s chip.
The card data is transacted via a reader that is part of a computing system. Smart cards improve the convenience and security of any transaction. They provide tamper-proof storage of user and account identity. Around the globe, bank controlled co-ops (Visa, MasterCard, Discover, and American Express) have rolled out millions of smart cards under the EMV (Europay, MasterCard, VISA) standard. Often referred to as chip and PIN cards; these are the de facto types of cards for bank issuance in most countries except the U.S. Smart cards have been proven to secure transactions with regularity, so much so that the EMV standard has become the norm.

As banks enter competition in newly opened markets such as investment brokerages, they are securing transactions via smart cards at an increased rate. Smart cards enhance trust through improved security. Two-Factor Authentication ensures protection of data and value across the internet. Threat from viruses such as the "Man in the middle" and "Trojan Horses" that replay a user name and password are eliminated. All this leads to improving customer service. Customers can use secure smart cards for fast, 24-hour electronic funds transfers over the internet. Finally, costs are reduced as transactions that normally require a bank employee's time and paperwork can be managed electronically by the customer with a smart card.

2.8 Cheque Deposit Machine (CDM) [34]

The cheque Deposit machine (CDM) is a unique automated machine that accepts a cheque and gives the depositor a scanned copy of the same with the date and time as an acknowledgement. This machine eliminated the dependence on human resources and speeds up the entire process, drastically reducing the time required for processing a cheque and significantly reducing the time taken to accept a cheque from a customer. It also eliminates the need for customers to wait in long queues for depositing cheques. The entire process is simpler, convenient and faster.
2.9 **Cheque Book Printing Machine** [35]
Cheque book production commonly uses laser technology and is performed at a central location, often outsourced by financial institutions. This leads to a number of problems, such as increased numbers of cheque fraud, increased rejection rate and high on-going costs.

One of the ways to reduce such problems is to automate cheque issuing with MICR impact technology that consistently produce high quality cheques. These machines have the capability of cheque issuing/printing application for printing personalisation and encoding the MICR data with MICR Encoder and Personalisation Machines. The machine also produces reports that track all the issued cheques for control and security purposes. It can be configured to print the whole MICR line and personalised to print specific details of account holder and Bank. This technology helps for faster and more efficient chequebook issuing, reduces cost and helps to effectively manage inventory and has the function to track all the issued cheques.

2.10 **Bunch Note Acceptor (BNA)** [36]
Depositing cash and cheques into bank accounts is still one of the main drivers for customers entering the branch. The greatest advantage of this technology is that it works on image based clearing where the image of the cheque taken is sent to the bank where it verifies whether the amount in the cheque and the one typed is the same. If both these amounts match, then the amount gets credited and otherwise it gets rejected. This also saves a lot of time.

2.11 **Point of Sale Terminals (POS)** [37]
In simple terms, a point-of-sale, POS, terminal is a place where the sales transaction occurs. It is a modern replacement for the cash register. Retail outlets use the POS terminal to track and record all customer purchases, process card payments, both debit as well as credit.
2.12 **Call Center** \[38]\n
A dedicated call centre has skilled service advisors, to help customers with banking queries and transactions. A trained team can also handle queries through computer systems, related to product information on, deposits products/schemes, loan products/schemes, credit/debit card, branch/ATM location, rate of interest/service charges, depository, enquiries on balance in accounts, transaction details, status of cheques sent for collection, interest earned and paid, standing instructions, TDS deducted, ODCC-limit/interest, credit card liability information, request for account statement – SB/CA/OD/CC/credit card, interest certificate for- deposits, TDS Certificate, loan account statement, loan interest certificate, internet banking - PIN not received, activating blocked PIN, login problem, Tele banking - PIN not received, activation of blocked PIN, regeneration of PIN and login problems. activation of restricted Debit card, non-receipt of debit card/credit card, debit card/credit card not working on POS/ATM, ATM transaction discrepancy, credit card transaction discrepancy etc.

**Conclusion**

In this chapter different electronic delivery channels have been discussed. Delivery channels have been described in terms of their functionality, facilities offered, advantages and disadvantages etc. Also the technologies used for some delivery channels have been discussed. This chapter is useful as it provides a theoretical background for understanding the application of delivery channels implemented by banks.
References

1. G. Gopalakrishna (2013), Speech delivered by Executive Director, Reserve Bank of India at “Axis Champions Awards” on October 1, 2013 at Mumbai


15. Ibid


29. Ibid


13. Ibid


“Rupay ATM card planned for no-frill account-holders”, Urban Credit, Jan-Feb 2011 Vol XXXIII, pp 46

http://jms.nonolympictimes.org/Articles/marticle.pdf


http://rits.infogile.com/pdf/Mobile_Banking.pdf

Ibid

Ibid

Ibid


http://whatis.techtarget.com/definition/kiosk

http://searchcio.techtarget.in/news/2240022850/SBIs-kiosk-banking-gears-up-to-empower-rural-India28

http://www.smartcardbasics.com/smart-card-overview.html

http://www.ksense.biz/content/smartchip.html

http://www.icicitrinity.com/cheque_deposit_machine.aspx


http://www.ehow.com/info_7792157_point-sale-terminal.html