Banking in Digital World

Contents

1. Understanding Digital Banking

The concept of digital banking is one of the most miss-understood terms used in the financial world. Most of the people failed to the see big picture in the context of digital banking, they simply view the concept as the internet or online banking. If you ask the bankers to define digital banking, the answer would be different for every second person you ask. It represents a computer-generated process that not just includes online or internet banking but also provides an end to end platform that encompasses both front (what customer can see) and back-end (that bankers see) of the banking services through the efficient network at both ends.

Although **digital banking** has the Internet as its core, there seems to be no agreement as to what this actually means. It is sometimes confused with mobile banking or even online banking. Digital banking is a concept rather than a service. Some regard it as the reshaping of banks and other financial institutions using digital technology. Some describe it as a technology that will record, process, receive, generate, display and transmit information almost instantaneously. Others consider it to be the application of technology to ensure that the account holder can have available the fast processing of any service required, free from errors and at low cost. It aims to enrich online and mobile banking services by integrating various digital technologies such as different payment system, mobile technology, and customer service.

A bank with the complete digitalized network would facilitate the customers at a functional level on all delivery channels. That is why digital banking is more than just online or mobile banking, it includes middleware solutions. Middleware is the software that links consumers through an operating system to the bankers or back offices to run the operations efficiently and smoothly. To consider true digitalization in the banking sector, departments like product development, operations, marketing, risk, and compliance must be included in the middleware solution to facilitate the operations conveniently. The use of latest technology is always inclined to several risks and security issues, banks must ensure security and compliance before implementing digitalization in banks.

If online or mobile banking is not same as digital banking then how can we define digital banking in the broader term?

1.1. Digital banking:

"Digital Banking is the application of technology to ensure smooth end-to-end processing of banking transactions/operations; initiated by the client, ensuring maximum utility; to the client in

terms of availability, usefulness, and cost; to the bank in terms of reduced operating costs, zero errors and enhanced services"

Digital banking confines multiple services delivered over World Wide Web with a purpose to serve both banker and customer at the same time by providing faster, convenient and better services as compared to the conventional banking. The shift from traditional to digital banking is not sudden rather it comes as a gradual change over the several years, hence the presence of digitalization in the banking sector may rather be described in degrees than categorizing into Yes or No. Digital banking involves high levels of process automation and middleware solutions enabling cross-institutional service structure to deliver banking services. Middleware assists the users to access financial data from multiple channels like desktop, mobile, worldwide web and ATM.

1.2. Key features of Digital banking

There are several features of digital banking, only the main seven are discussed below.

Customer-centric strategy:

Customer-centric approach refers to the way of doing business in a way to achieve a better and positive customer experience. Achieving the strategy should be the main goal of any digital transformation in any sector. As a result of digitalization, the banking sector will reach the long-awaited customer's loyalty. Products and service offered after digital transformation in banking must be smart, tailored and responsive to the customer. Implementation of digitalization is not an isolated phenomenon; it must include all departments in the strategy in order search for a solution in a multidisciplinary way.

Remove barriers between departments:

Removing barrier and gaps between the departments is one of the main objectives of digital transformation in the banking sector. The transformation is meant to develop at the organizational level to carry out the operations and processes successfully. This digital transformation will encourage the banks to build a team rather than isolated departments. Involving all departments in the digital culture will enhance cross-knowledge between the departments that ultimately foster responsiveness in banking operations.

Working on new business models:

The inclusion of financial technology leads to innovation in banking products. Digital transformation is accelerating innovation in product development that will result in new business model startups. There are several examples of new technologically advanced products offered by banking companies like mobile banking app, online account form, bio matric access to ATM machines.

Collaboration and competitiveness

Another one of the major key pillars in the digital transformation of banking is collaboration among all players in a banking transaction. In order to improve the services through digital transformation, collaboration must be observed among back office, middleware and customers to improve the quality of service. Building and promoting every single task through collaboration will lead the company to secure a better competitive edge over the other participant of the same sector.

Responsiveness to innovation planning

Even though it may look contradictory, the process of digitalization in banking sector must be continuous. Constantly evolving change is necessary to keep up with the pace of technological innovation. These innovations will also consider the needs of the customers and financial sector.

The innovation laboratories that are being implemented in many banks cannot be flash in the pan and have to impact all departments in banks.

Building an IT infrastructure:

Building an up-to-date IT infrastructure is one of the major features of digital banking structure. Building an IT infrastructure will help the financial sector to take advantage of the third parties to gather information and offer the information to the others. This technological advancement will result in an open innovation process where several parties gather and offer the information and knowledge in shorter time. IT infrastructure will help the financial sector to achieve consistent customer interaction, scalable solutions and enhances Omni-channel experiences.

Eco-friendly:

Another important feature of digital banking is it saves the environment from pollutants. Banking transformation in digital world reduces the paperwork, office space, construction of large buildings, and another vehicular movement. It can solidly be categorized as eco-friendly imitative in the financial sector, individuals are getting pollution free banking experience.

2. Benefits of digital banking

2.1. Benefits to Bank

There are several benefits to a bank can be observed by digital transformation.

Business efficiency:

Through digital transformation not only the customer interaction and overall operations have improved; it also strengthens the ways to make the internal process more efficient. Banks had been working on the consumer end for decades, implementation of digitalization at all level will accelerate business productivity.

Cost savings:

Cost cutting is one of the major challenges faced by banks. Top management is always striving hard to reduce the overall cost of banks to achieve better financial results. Using advanced technology would replace redundant manual labor and ultimately reduce the cost. Traditional bank processing is costly, slow and prone to human error, according to McKinsey & Company. Relying on people and paper also takes up office space, which runs up energy and storage costs. Digital platforms can future reduces costs through the synergies of more qualitative data and faster response to market changes.

Increased Accuracy:

Due to lack of IT integration, traditional banking operations mostly rely on manual and paper processing, which may require reworking due to the increased error rate. In absence of IT infrastructure, coordination between the front office and back office was negligible, which reduces the business efficiency. By digital transformation of the banking sector, it becomes easier to have interdepartmental coordination by using business and software with more accurate and errorless processing of banking operations.

Improved Competitiveness:

The competitive position of a bank becomes more stable by implementing digital solutions. Digitalization will help the banks to extend their marketing campaigns, build closer customer relation, and reach a broader market. Customer relationship management (CRM) is used excessively to have a 360-degree view of customers. With the help of CRM, bankers can easily access history,

past record, personal information, requests, orders, and many other services related to a particular customer on one screen. Use of CRM allows the banks to improve customer loyalty and satisfaction.

Enhanced Security

As banks are playing with the people's money, financial security cannot be compromised by banks at any level. Extra layers of security should be developed to protect the online network of the financial transaction from cyber threat. Enhanced security features can only be developed if banks had already implemented cutting-edge IT infrastructure.

No Paperwork

The first ~~this~~ that comes into our mind after perceiving the idea of banking digitalization is paperless banking. The digital transformation of banks have made almost everything digital, you do not require papers in hard form, even customers' requests are being entertained online through internet banking. Customers can even get their monthly, quarterly, or annually account statement through the web.

Greater agility:

Internal and external processes can be accelerated with digital transformation, which will ultimately result in the customer retention and customer satisfaction. For example, an increased importance was placed on risk management. Instead of hiring and training risk managers, there is a large amount of software that can sense and react to market changes more quickly than concerned professionals.

2.2. Benefits to Customers

Banking made easier:

Banking is made easier, faster, and reliable by technological advancement. The Internet enables you to bank anytime from anywhere around the globe. You can check your account balances, previous transactions, and even conduct a new transaction using technology. Customer support cells are open 24/7 for guidance existing and potential customers of banks. Further, several other services can be obtained by few clicks, making it even simpler and effortless.

Better Profit Rates:

As a result of full digitalization, banks tend to reduce their cost in terms of overheads and other infrastructure costs. Going online with its services will reduce the manpower and which ultimately reduce the overall cost of the ban, as a result relatively higher profit rates offered to depositors.

The mobility of services:

Digitalization enables you to develop mobile responsive websites and applications so that banking services can easily be accessed through smartphones, tablets, and computers. Transactions can be made through just a single click using smartphones and tabs.

Eco-friendly:

Digital banking introduced paperless banking, customers' request is taken in digital forms, emails and through call centers. Digital banking is giving the customer a pollution free experience.

Saves Time and money:

One of the biggest benefit enjoyed by the customers by using digital channels of a bank is to save their time and money as well. There is no need to go to the bank for transferring funds, bill payments, requesting checkbooks or delivery of ATM cards. Cash needs can be fulfilled using ATMs and plastic cards.

No Queues:

Using digital channels offered by banks, the customer can enjoy hassle-free services without waiting hours standing in a queue for just a single transaction. Further, the payment gets transferred in minutes.

3. Need for Digitization

3.1. Challenges for banking digitization:

Customer Centricity:

An organization being customer-centric is a major challenge for a bank to implement digitalization. Customer centricity is a way of doing banking business in a way that creates a positive customer experience. Being customer-centric let the bank to drive repeat customers, customer loyalty, and overall profit. It will require the bank to access the needs, listen to the demand of customers and

meet their needs through banking digitization. The banking industry needs to integrate customer centricity with digital channels used by banks to provide banking services.

- Customer focused leadership
- Understanding your customers
- Design your experience
- Empower the frontline
- Feedback for continuous improvement

Customer Expectation:

One of the major challenges for banks for digitalization is to meet customers' expectation. Customers always seek efficient, reliable and friendly services, but with the development of new technology, the expectation level has been increased drastically. Apart from efficiency and reliability, customer needs personalized services. Banks need to stay up-to-date with the changing dynamics of customer expectation.

There are several trends through which customer expectation have been changed in last few years. Customers expect 24/7 online culture to be implemented in true letter and spirit, shopping habits have been changed to use Omni-channels, social media has made customers more aware, mobile-focused culture is now been expected by customers so that banking services can be accessed through mobile software.

Competitiveness:

It refers to the ability of a firm to offer products and services that meet the industry standards at competitive prices that provide utility to the consumer. Offering products and services at competitive price and making the process simpler for the customer is another challenge for banks to provide tailored fit products after implementing digitalization in banking systems. Banks need to understand the overall market position and customer's needs to develop an IT-based infrastructure.

Marketing and Branding:

With the changing needs and expectation of customers, banks need to focus on establishing its brand image and trust on the products and services offered to customers. The reputation of a bank and trust is also a major challenge faced by banking companies to develop a digital framework in its operations. As far as the online network is concerned, banks need to ensure the trust among its

customers as they are using services away from bank premises trusting bank's IT infrastructure. Innovation in services is highly demanded by customers, banks need to develop products and services as per the customer's needs.

Risk mitigation:

Mitigating and managing risk is the need of the hour for the banking industry. In order to develop fair and sound digital framework, banks need to establish fully integrated IT set-up capable enough to detect frauds and other risk factors to safeguard consumers' safety concerns. Banks need to identify the steps and actions to prevent fraudulent activities. For example, ATMs are functioned in such a way that ATM cards got retained after two wrong attempts of the passcode. Apart from this, customer needs quicker and faster response from the bank without any delay caused by system or networking error. A team should be lined up to address such issues in quicker and faster way.

Operational Efficiency:

It refers to the provision of financial services in secure, safe, speedy and cost-effective manner. The ultimate challenge for banks to transform its traditional network into a digitalized framework with least friction in terms of time and cost-effectiveness. Banks need to ensure better performance using digital means of delivery channels with more automated processes that will reduce the intervention delays.

A Single view of Customer:

Another key challenge for banks is to understand the customer behavior and lifecycle for using a particular product or service. In addition, to drive positive customer experience, increasing loyalty, developing a brand image, and reducing churn rate, it is a vital challenge for a bank to develop an overall profile of the customer that depicts an overview of customer's previous behavior and lifecycle. This can only be possible by developing a 360-degree view of the customer to get customer's insights. A large number of software is designed for this purpose, and banks need to transform the data into digital format.

4. Digital Banking Products

4.1. Real Time Gross Settlement (RTGS) mechanism:

The system is a special fund transfer system in which money is transferred from one bank to another on a "real-time" and "Gross" basis. "Real-time" settlement means that payment transactions are not

subject to any waiting period and transactions are settled immediately after processing. "Gross settlement" means that transactions are settled on a one-to-one basis and are not bundled or settled with any other transactions. "Reconciliation" means that the payment is final and irrevocable once processed.

RTGS systems are typically used for high-value transactions that involve instant settlement. In some countries, the RTGS system may be the only way to obtain liquidation funds on the same day, so it can be used in urgent settlement payments. However, most recurring payments do not use the RTGS system. Instead, they use a national payment system or network that allows participants to pay in bulk and net. RTGS payments usually result in higher transaction costs and are usually operated by a country's central bank.

How does it Work?

The RTGS system is usually managed by a country's central bank because it is considered a key infrastructure for a country's economy. Economists believe that an efficient national payment system reduces the cost of trading goods and services and is essential for the functioning of banks, currencies and capital markets. A weak payment system can seriously hinder the stability and development of the national economy, its failure can lead to inefficient use of financial resources, unfair sharing of risks between agents, the actual loss of participants and the loss of financial systems and money.

The RTGS system does not require any exchange of physical funds, the Central Bank adjusts the electronic accounts of Bank A and Bank B, reduces the balance of bank account A by the corresponding amount and increases the balance of Bank B's account for the same amount. The RTGS system is suitable for small and high-value transactions. It reduces the risk of settlement, except to accurately describe the institutional account at any time. The objective of the central bank RTGS system in all countries is to minimize the risk of high-value electronic payment and settlement systems. In real-time payment settlement systems, transactions are settled continuously in the accounts held by the central bank. Reconciliation is immediate, definitive and irrevocable. The credit risk due to the settlement time is eliminated. The best national RTGS payment system covers up to 95% of high-value transactions in the domestic currency market.

The RTGS system is an alternative to the previous system of the day end transaction also referred to the net settlement system. In the net settlement system, all inter-bank transactions for the day are accumulated, and at the end of the day, the central bank adjusts the bank's account based on the net amount of these transactions.

Why need RTGS?

There are several reasons why central banks use RTGS.

1. First, the decision to adopt is influenced by the pressure of competition in the global financial market.
2. Second, if it is allowed to access a wide range of RTGS system systems in other countries, it would be more advantageous for the central bank to adopt the RTGS system.
3. Third, knowledge gained through the experience of the RTGS system is likely to spill over to other central banks and help them make adoption decisions.

4.1.1. Pakistan Real Time Interbank Settlement Mechanism:

The PRISM (Pakistan Real-time Interbank Settlement Mechanism) system was developed in response to a growing number of people recognizing the need for reasonable risk management in the settlement of large amount transfers in Pakistan. The PRISM system operated by the State Bank of Pakistan provides a powerful mechanism to limit settlement and systemic risks in the interbank settlement process by providing settlement on a gross basis and in real time. In addition, PRISM helps reduce the risk of settlement in securities trading by providing a basis for a delivery versus payment (DvP) mechanism.

PRISM Participation:

Participation in PRISM System is based on SBP's approval which after assessing the institutions financial standing and based on a pre-defined risk management criteria approves an institutions request for Participation in PRISM System.

PRISM Components:

PRISM System comprises of two major applications i.e. RTS/X and Depo/X. RTS/X is funds transfer application operated through software installed by SBP at Participant's premises. Depo/X is securities settlement web-based application and is connected in Real Time with RTS/X applications to ensure transaction in DvP basis.

Payment processing:

Main features of payment processing in PRISM System are as follows:

1. Queuing:

If the covered funds are insufficient for settlement, the PRISM system temporarily leaves the transfer order in its central processor (the queue at the center). In this case, the instruction to wait for the transfer will wait in line and issue the settlement when the funds are provided on the basis of the FIFO and priority principal. The management of the queue can be performed by the bank alone or/and the national bank.

2. Priority:

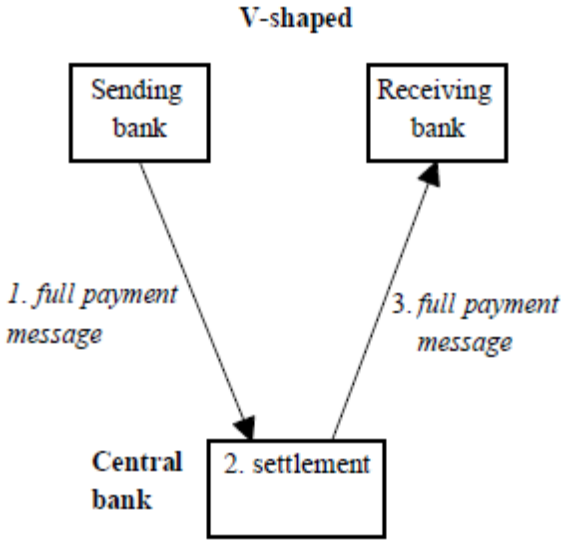
Participants in the PRISM system can assign different priorities to their payments based on the importance of the payment. PRISM participants can assign priorities from 10 to 99 to payments.

3. Gridlock:

The PRISM system is also equipped with a Gridlock resolution mechanism that, when activated by the SBP, can use a different algorithm to rearrange the payment priority in the queue and offset a large number of transactions in individual ways.

Message flow structures:

The arrangement for routing messages in the PRISM system is based on V-shaped message flow structure. In this structure, complete information including all information about the payment (including, amount, purpose, bank account details of the beneficiary) is initially transmitted to the State Bank and is sent to the receiving bank only after the Central Bank has settled the transfer.



4.2. SWIFT Payments: The Financial Messaging Network

Financial institutions rely on SWIFT (Society for Worldwide Interbank Financial Telecommunication) to send and receive information accurately and confidently, such as funds transfer instructions.

Although there are other data services such as CHIPS, Fedwire, Ripple and SWIFT still maintain its dominant market position. It further promotes fund transfer and direct processing by continuously investing in innovation and adding new message codes.

Introduction:

The SWIFT payment system was established in 1973 ensuring the delivery of payment and confirmation information mainly in the fields of the treasury and correspondent banks. The goal is to create a global shared financial information service that uses a common language for international financial information. Today, SWIFT's services have been used and trusted by more than 11,000 financial institutions, sending more than 25 million messages daily to more than 200 countries and territories worldwide.

How does the SWIFT Work?

Having standardized information services means that transactions between financial institutions are recorded in the same manner, thus providing concise and transparent details about remittances. The SWIFT network does not actually transfer funds but uses BIC (SWIFT) codes to send payment orders between the accounts of various banks. SWIFT acts as an ISO registry, issuing BICs to financial institutions and non-financial institutions, and it needs to use this criterion to facilitate the automated processing of information in financial services funds or securities transfers.

SWIFT does not facilitate the transfer of funds. Instead, it sends payment messages in a unified format. These payment orders must be settled by the banks to their respective accounts. In order to exchange bank transactions, each financial institution must enjoy these specific business features through the bank or attached to one (or more) banking relationships.

Data Centers:

The SWIFT security information network operates from two data centers, one in the United States and the other in the Netherlands. These centers share information almost in real time. If one of the data centers fails, the other can handle the entire network traffic. SWIFT uses submarine communications cables to transmit its data.

SWIFT opened a third data center in Switzerland, which began operations in 2009. Since then, data from European SWIFT members is no longer reflected in the U.S. data center.

SWIFT message types

You can read SWIFT's message type for details on all the message formats used in financial transactions. However, from a payment perspective, MT1XX is the most relevant type of information for individuals and corporate customers when making international remittances. All SWIFT payment transfer messages contain the text "MT" (message type). Followed by a three-digit number indicating the message category, group and type.

For example, MT103 is a SWIFT payment message type that is specifically designed for cross-border/international wire transfers and is used primarily between banks and non-bank financial institutions. The MT103 is used to make a single payment, and there are numerous options to accurately describe how the payment should be (for example, determine the payee account and sender bank details). MT202 is used as an additional payment message and sent to the intermediary bank to speed up the payment process for customer credit transfers

Some of the Message types for SWIFT is given below. However, there are series of messages starting from MT100 to MT999

MT 101	**Request for Transfer**
MT 102	Multiple Customer Credit Transfer
MT 103	Single Customer Credit Transfer
MT 110	The advice of Cheque(s)
MT 111	Request for Stop Payment of a Cheque
MT 199	Free Format Message
MT 200	Financial Institution Transfer for its Own Account
MT 202	General Financial Institution Transfer
MT 299	Free Format Message
MT 410	Acknowledgment
MT 701	Issue of a Documentary Credit
MT 799	Free Format Message
MT 900	Confirmation of Debit

4.2.1. Processing of Wire Transfer through SWIFT

Not every bank has a relationship with all banks around the world. There may come a situation where banks need to deal with other counterparts whom no agreement had been made for transferring the amount from account to another. In all such cases where no relationship exists between two banks, the role of the correspondent bank is very important there.

Correspondent Bank:

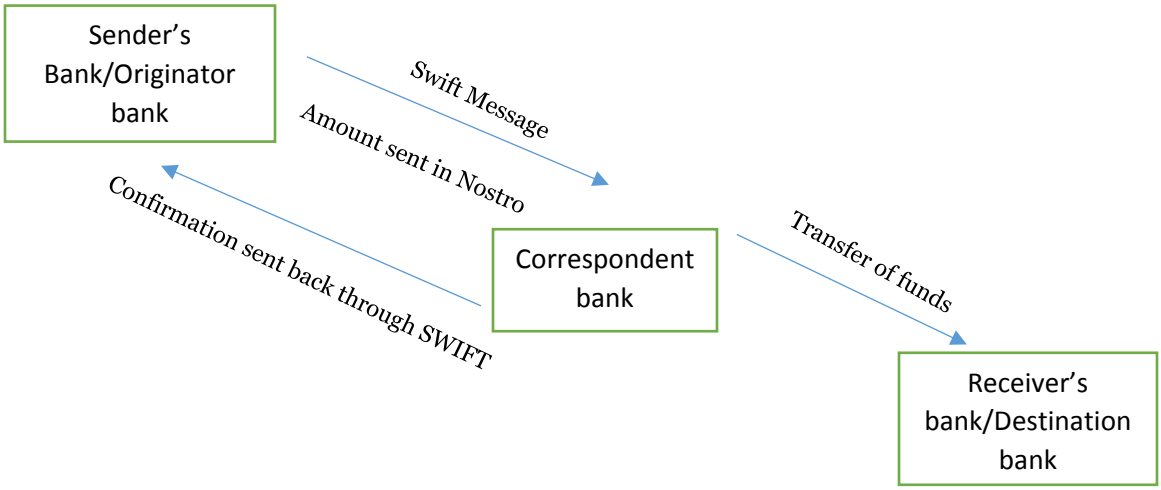
A correspondent bank is a financial institution that provides services on behalf of another, equal or unequal, financial institution. It can facilitate wire transfers, conduct business transactions, accept deposits and gather documents on behalf of another financial institution. Correspondent banks are most likely to be used by domestic banks to service transactions that either originate or complete in foreign countries, acting as a domestic bank's agent abroad.

Process Flow:

International wire transfers usually occur between banks that do not have a financial relationship. When no agreement is placed between the bank that sent the wire transfer and the bank that receives the amount, the correspondent bank must act as an intermediary. For example, a bank in

San Francisco has received instructions to allocate funds to a Japanese bank, but if there is no working relationship with the receiving bank, the bank cannot directly call the funds.

SWIFT network is used to execute the international wire transfers. If there is no working financial relationship with the receiver's bank then the sender's bank will search for the correspondent bank that already has an arrangement with the destination bank.



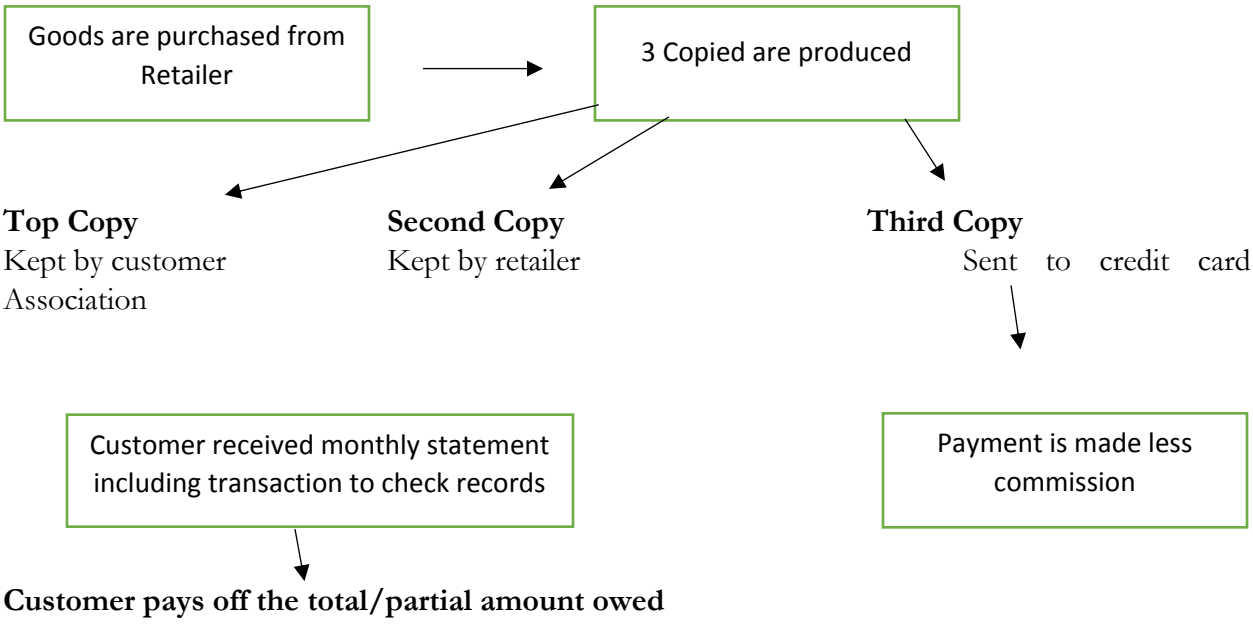
4.3. Plastic Cards:

4.3.1. Credit Cards

Credit cards are plastic cards showing the cardholder's name, a 16-digit account number, an issue date, an expiry date and on the reverse. The signature of the card-holder and the security code. Credit cards can be owned by anyone. Their use worldwide k increasing rapidly. They are a permanent form of credit. The two best-known cards are MasterCard and Visa. These credit card companies are linked to the banks who use their surplus funds for this profitable business.

A credit card company enrolls retailers, garages and other businesses that are prepared to accept its credit cards. It also invites applications from individual people who wish to use the card. These people must have a minimum level of income, e.g. $30 000 a year (minimum limit may vary from country to country). Each cardholder is given a credit limit. This is the maximum amount that the cardholder can have on credit. The credit limit may vary. New customers may have a low credit limit. As they use the card, the credit limit increases. The customer can, however, refuse to have an

increased limit. The cardholder purchases goods and services using the card. He or she may sign a counterfoil but nowadays the chip and pin technique is becoming more widespread. This enables the card number to be validated — enough credit available to make the purchase — and to check that the card has not been stolen. The cardholder is given a copy of the bill. The retailer keeps a copy. Another, signed copy, is sent to the credit card company (MasterCard, VISA).



The credit card company charges the business commission on sales. It pays the business at regular intervals less the commission which may be as much as 3 percent of the sales figure.

The cardholder receives monthly statements showing the transactions for the previous month and the total amount owed. The cardholder can pay off the whole amount owed at the end of the month without paying interest or can pay a proportion. Interest is charged if the amount is not paid off in full and this is shown on the statement. If debts are carried over, there is usually a minimum repayment of 2-3 percent of the balance each month.

It is also possible to obtain a cash advance using a credit card at a bank or using an Automatic Teller Machine (ATM). Interest is charged from the day the cash is withdrawn and a handling charge is also made. It is not advisable to use a credit card to obtain cash for these reasons but this service can be useful to obtain cash quickly and easily in a foreign country.

MasterCard and Visa credit cards are issued by most of the major banks. They are issued by other organizations such as large stores and charities. Some credit cards offer zero percent or low rates of interest to new account holders for a limited period to attract new business. Some credit cards offer rewards, loyalty points or cash back in return for full payment each month.

Key Players

The Cardholder:

It is the one who holds or obtains a credit card from issuing bank. The cardholder can present the card to the merchant and another retail agent for payment purposes.

The Issuing Bank (Cardholder's bank):

A bank that issues credit cards to its customers is called issuing bank or cardholder's banks. The issuing bank is also a member of card associations (Master and Visa). It pays the acquiring bank for the purchases made by its customers using credit cards.

Acquiring bank:

Acquiring bank is often known as merchant's bank because they made a contract with merchants allowing them to accept credit cards for payment purpose. Acquiring bank provide equipment, software and other necessary aspects to the merchant to help in accepting credit cards and to handle customer service in a better way.

Acquiring banks is also a registered member of card associations (MasterCard and Visa). As the card banking evolved in recent years, acquiring bank hire some third part Independent Sales Organization (ISO) and Membership Service provider (MSP) to monitor and conduct day to day transaction of merchants. That's the reason most of the merchant does not recognize their acquiring banks as a primary service provider of merchant account.

Card Associations:

It includes those companies that act as custodian and clearing agents of their respective card brands. Card associations never issue credit cards or merchant accounts but they act as a governing body of the community of the banking sector, ISOs and MSPs who work together to monitor and control the payment system through credit cards. Card associations include Visa, MasterCard, American Express, RuPay, Union Pay, 1Link, and Mnet.

The primary responsibilities of the Card Association are to govern the members of their associations, including trading fees and standard guidelines, act as the intermediary between issuing and merchant's banks, maintain and improve the card network, and, make a profit.

Merchant:

Lexically, the merchant is an entity that is the engaged sale of goods and services. But in context of the credit cards payment system, any business that maintained a merchants account offered by acquiring bank enabling them to accept credit cards for payment from their customers for goods and services provided

Steps involved in a normal transaction:

Authorization:

The customer presents the card to the merchant for payment, the merchant submits the transaction to the acquiring bank. The acquiring bank verifies the credit card number, type of transaction and amount with the issuing bank and with the help of card association reserves the amount from the credit card for the merchant. In the end, an authorization code is generated for the merchant for record purpose.

Batching:

All the authorized transactions are stored in "Batches" by the merchants, which merchant send to the acquiring bank for claiming the amount. In the normal routine, the merchant sends the batch at the end of business day. If any of the authorized transaction not sent to the acquiring bank, its validity will remain the same within the specified time period given by the issuing bank. However, few transactions come under the limit of the merchant that need not be sent along with batches.

Clearing and Settlement:

The acquiring bank sends the batch transactions through the credit card association (Visa or MasterCard), which debits the issuing bank for payment and credits the acquiring bank account. Essentially, the issuing bank pays the acquiring bank for the transaction.

Funding:

Once the acquiring bank receives the amount, the total amount will be transferred to merchant's account fewer commission charges that are usually not more than 2 – 3 percent of the total sale amount.

Chargebacks:

In case of any dispute related to the transaction, cardholder often requests for a chargeback. In the event of a chargeback, the issuer returns the transaction to acquiring bank for resolution. The acquiring bank then sent the query to the merchant for resolution.

Advantages to the Cardholder

- Credit cards provide instant credit and are simple and quick to use.
- It is safer to carry a credit card than to carry a large sum of money.
- Free credit can be obtained for at least a month. It is possible to obtain up to eight weeks' free credit if purchases are made at a particular time in the month.
- Credit cards can be used in many different outlets, e.g. shops, hotels, garages, restaurants and in many different countries.
- Credit card companies may offer zero percent interest for up to twelve months to transfer balances from another credit card. This may help people to avoid the interest payments on arrears.
- Credit cards can be used to obtain cash advances in the currency of the country you are in.
- If the cardholder is a business person, the credit card can be used to charge expenses. The business person does not have to use his/her own money and, hopefully, the expenses would be paid before the credit card payment is due.

Disadvantages to the Cardholder

- Although credit cards are used worldwide, they are still not accepted in many outlets. In Pakistan, credit cards are accepted in the top range of hotels but they are not accepted in the majority of budget hotels. The up-market shops and restaurants do accept them and cash advances can be obtained at some banks but not those in the smaller towns.
- The rate of interest charged is higher than that for other forms of credit and for a bank loan.
- Consumers tend to be tempted to spend more than they should and so are unable to pay off the debt at the end of the month.
- Sometimes prices are higher because the retailer wishes to cover the commission charged by the credit card company.

- If a card is stolen or `cloned' i.e. copied, many unauthorized transactions may result before the fraud is discovered.
- If a card is lost or stolen and the cardholder does not inform the credit card company, the cardholder could be liable for losses resulting from the misuse of the card.

Advantages to Businesses of accepting Credit Cards

- Accepting credit cards usually means that a business increases sales. It may also give the business a competitive edge over any rival businesses that do not accept credit cards.
- The business does not have to hold too much cash on the premises which reduce the security risks to the business.

Disadvantages to Businesses of accepting Credit Cards

- The businesses are charged some commission by the credit card companies.
- Accepting credit cards increases the paperwork and the records need to be kept.
- Extra time is needed to check for stolen cards and credit limits of customers.
- Businesses selling large quantities of goods on credit may experience delays in receiving the payments. This does not help their cash flow.
- Credit card fraud and bad debts may mean losses to the credit card company.

4.3.2. Debit Cards

A debit card is a plastic card that allows the customer to make instant payment for goods. They were first introduced as substitutes for cheques. The card is swiped through a reader and the signed authorization given to the customer acts as a receipt. The amount of money is automatically deducted from the person's bank account and credited to the retailer's account using electronic funds transfer at the point of sale. Sometimes this occurs on the same day but sometimes the transaction may take a few days.

Debit cards are becoming much more popular as a means of payment because the shopkeeper or creditor receives the money almost at once (unlike a credit card payment) and there are no bad debts. If there is no money in the account of the customer, the debit card will be rejected at the time of the purchase. They are particularly popular in countries where buying on credit is still not very acceptable. In China in 2006, there were 1120m debit cards in circulation compared to 56m credit cards.

Debit cards do not offer credit, some of the banks deduct annual charges for providing the debit card service to their customers. Debit cards are quicker to use than cheques and can be used alone to complete a purchase.

(A person will need a cheque and a cheque guarantee card when using a cheque). There is no limit to the value of the transaction provided there is sufficient money in the current account of the customer. In some shops, you can also obtain 'cashback' when paying for goods your goods cost $25, you pay $40 using your debit card and you receive not only your goods but also $15.

Debit cards can be used to withdraw cash in another country from cash machines displaying the card association's symbol, the handling charge is usually made. They can also be used to purchase goods in another country, again an extra charge is made.

Key players

The key player involved in a debit card transaction is same as in credit card payment system.

The Cardholder:

It is the one who holds or obtains a debit card from issuing bank. The cardholder can present the card to the merchant and another retail agent for payment purposes. The cardholder can use the card in ATMs for cash withdrawals.

The Issuing Bank (Cardholder's bank):

A bank that issue debit cards to its customers are called issuing bank or cardholder's banks. The issuing bank is also a member of card associations (Master and Visa). It pays the acquiring bank for the purchases made by its customers using credit cards.

Acquiring bank:

Acquiring bank is often known as merchant's bank because they made a contract with merchants allowing them to accept debit cards for payment purpose. Acquiring bank provide equipment, software and other necessary aspects to the merchant to help in accepting debit cards and to handle customer service in a better way.

Also, if debit cards are used in ATMs for cash withdrawal other than the issuing bank then that venue used for cash with drawl will also be the acquiring bank

Card Associations:

It includes those companies that act as custodian and clearing agents of their respective card brands. Card associations never issue Debit cards or merchant accounts but they act as a governing body of the community of the banking sector, ISOs and MSPs who work together to monitor and control the payment system through credit cards. Card associations include Visa, MasterCard, American Express, RuPay, Union Pay, 1Link, and Mnet.

The primary responsibilities of the Card Association are to govern the members of their associations, including trading fees and standard guidelines, act as the intermediary between issuing and merchant's banks, maintain and improve the card network, and, make a profit.

Merchant:

Lexically, the merchant is an entity that is engaged in the sale of goods and services. But in context of the plastic cards payment system, any business that maintained a merchants account offered by acquiring bank enabling them to accept debit cards for payment from their customers for goods and services provided.

Steps involved in a normal transaction:

Authorization:

The customer presents the card to the merchant for payment, the merchant submits the transaction to the acquiring bank. The acquiring bank verifies the debit card number, type of transaction and amount with the issuing bank and with the help of card association amount is directly debited from issuer's account without creating the reserve against credit limit.

Card association confirms the transaction data, it performs a fraud analysis and forwards the information to the issuer bank. The issuer then authenticates that the card hasn't been reported as stolen or lost, confirms whether funds are available in the cardholder's account and then notifies the merchant, again through the card association, whether the transaction has been approved. In the end, an authorization code is generated for the merchant for record purpose.

Clearing:

All the authorized transactions are stored by the merchants, which merchant send to the acquiring bank through card associations (Master or Visa) for claiming the amount. In the normal routine, the merchant sends the transactions at the end of business day. In response to the authorized transaction, the funds are transferred from issuer to acquirer.

Settlement:

As a final point, the card association calculates how much money each issuer owes the acquiring bank and how much money the network owes each merchant. Once the acquiring bank receives the amount, the total amount will be transferred to merchant's account fewer commission charges that are usually not more than 2 – 3 percent of the total sale amount.

Advantages of using a Debit Card

- Easy to carry around
- Saves carrying cash thus reducing the dangers of theft
- Some shops operate a cashback scheme using debit cards
- Helps people to control spending — they can budget for what they can afford

Advantages to the Retailer of accepting Debit Cards

- Payment is guaranteed
- No bad debts
- Instant payment — compared with credit cards
- Can be used when cheques may be refused

Disadvantages of using Debit Cards

- Easy to steal or to lose
- No credit offered
- Need to have sufficient funds in the current account

Disadvantages to the Retailer of accepting Debit Cards

- The percentage charged by the bank to handle transactions
- Need to have the necessary equipment to process debit cards
- Unlikely to increase turnover as no credit is given

4.4. Internet/Online/E-Banking:

Internet banking, also known as online banking, electronic banking or virtual banking, is an electronic payment system that allows customers of banks or other financial institutions to conduct a series of financial transactions through the websites of financial institutions. The online banking

system is usually connected to or becomes part of the core banking system operated by the bank, which is in contrast to the branch business of traditional customer access banking.

How it Works

To access the financial institution online banking service facilities, customers who need to access the Internet need to register the service with the institution and set passwords and other credentials for customer verification. Online banking credentials are usually different from a phone or mobile banking. Financial institutions now often allocate the number of customers, whether or not they indicate their intention to visit their online banking facilities. The customer number is usually different from the account number because multiple customer accounts can be linked to one customer number. Technically, the customer number can be associated with an account of a customer-controlled financial institution, although financial institutions may limit the range of accounts that can be accessed, such as checks, savings, loans, credit cards and similar accounts.

The customer accesses the financial institution's secure website and uses the previously set customer number and credentials to access the online banking facility. The types of financial transactions that customers can conduct through online banking are determined by the financial institution, but typically include obtaining account balances, recent transaction, electronic bill payments, and fund transfers between customers or other accounts. Most banks also allow customers to download copies of bank statements that can be printed in the customer's house (some banks charge the cost of mailing hard-copy bank statements). Some banks also allow customers to download transactions directly into their accounting software. The facility also enables customers to order checkbooks, statements, report loss of credit cards, stop cheque payments and suggest changes to addresses and other daily activities.

Types of services performed by a bank customer:

There are two types of transactions performed by online banking customer.

Transactional Tasks:

- Viewing account balances
- Viewing recent transactions
- Downloading bank statements, for example in PDF format
- Viewing images of paid cheques
- Changing personal information

- Ordering checkbooks
- Download periodic account statements
- Downloading applications for M-banking, E-banking etc.

Non-transactional tasks:

- Funds transfers between the customer's linked accounts
- Paying third parties, including bill payments and third party fund transfers
- Investment purchase or sale
- Loan applications and transactions, such as repayments of enrollments
- Credit card applications
- Register utility bills and make bill payments

Main Concerns in Internet banking

Security:

The security of transactions is a major concern of banks, and lack of security can lead to serious actual losses. Examples of potential harms to online banking include online transactions, electronic money, etc.

Anonymity:

The privacy issue is a subset of the security issues that banks face. By strengthening the confidentiality of sender's personal information and improving the security of transactions. Examples of private information related to online banking include the transaction amount, the date and time of the transaction, and the name of the place where the transaction occurred.

Authentication:

Encryption can help secure transactions, but it is also necessary to ensure that transactions are free from any amendment from either end. There are two ways to do this to check the integrity of the message. One form of verification is a secure hashing algorithm that protects the data from any modifications (Fleeger, 1997). In practice, the sender sends the data generated by the hash algorithm. The recipient performs the same calculations and makes sure everything is working. If two results are different, a message change occurs. Another form of verification is the verification of the authenticity of electronic money or the signature of a third party called a certification authority (CA).

Divisibility:

Electronic funds can be divided into different currency units that are similar in value to real money. For example, electronic money needs to take into account pennies and coins. At least to some extent, online banking has become the norm for many simple banking transactions. This is not a bad thing - consumers can check their accounts more easily and safely, pay bills and transfer money from one account to another. They are more likely to actually perform these things and maintain a more organized financial life. However, it is important to realize that just because online banking is a good complement to the consumer banking industry, it does not necessarily mean that all direct Internet banks can replace their physical bank branches.

4.5. Mobile banking

Mobile banking allows bank customers to use banking services through a mobile device such as a smartphone or tablet, often using a dedicated banking app. It is to use when on the move and far away from a bank or the home computer. The mobile app is a cut-down version of the bank's website. After logging on using a digital security key and password the user can view the balances in accounts and has access to a range of banking services.

Mobile banking is particularly useful where banks are available only in large cities such as in Nepal and Kenya, in countries where there is little or no infrastructure - for example, parts of Zambia - and for those living in remote or rural areas - for example, in the Maldives atolls. Mobile banking is becoming increasingly popular worldwide. In 2012, 47 percent of the population of South Korea used mobile banking. In the UK, transactions using the Internet and mobile banking accounted for over £1 billion in 2014.

Bank services using mobile banking can be classified as either inquiry as 'push' or 'pull' transactions depending on who instigated the inquiry.

Pull transaction

A pull transaction is a transaction in which a mobile phone user actively requests a service or information from a bank. For example, looking up an account balance is a pull transaction. The same is true of transferring funds, paying bills or requesting transaction records. Since the bank must respond or take some action based on the user's request, the pull transaction is considered a two-way transaction.

Push transaction

Push transactions, on the other hand, are transactions in which a bank sends information based on a set of rules. The minimum balance alert is a good example of a push transaction. Customer-defined rule - "Tell me when my balance is less than $ 100 -" and the bank generates an automatic message at any time when the rule applies. As long as there are debit transactions or bill payments, similar alerts can be sent. As these examples illustrate, push transactions are usually a way to get from the bank to the customer.

	Push: Bank sends out the information to customers	**Pull:** Customer requests services or information to the bank.
Transaction	• Minimum balance alert • Periodic bank statement • Salary and other credits to account • Large value withdrawals • Credit card transactions	• Funds transfer between accounts • Bill payment • Canceling direct debit or standing order • Deactivating lost Debit or Credit Card • Ordering Checkbooks and ATMs
Inquiry	• Alert about unauthorized access • Information on saving accounts • Information on interest rates • One-time-password to prevent fraud	• Account balance request • Mini bank statement request • Request for information on exchange rates

One of the main dangers of using mobile banking is fraud, especially when the phone is connected to the Internet. This can be minimized by using a pin code, ensuring that passwords are not accessible or installing a security system.

Benefits to the customer of mobile banking

- Improved services that are available 24/7, wherever you are.
- Provides 'smart' banking, allowing all transactions to be completed from a variety of devices.
- Feeling engaged and valued as a customer.

- New client services, for example, alerts.
- Follow-up services based on what the account holder is doing,
- May lead to lower charges for banking services.
- Faster access to money.
- Saves travel to bank branches.

Benefits to the bank of mobile and digital banking

- Lower operating costs, such as the elimination of some costly back-office operations.
- Fewer errors,
- A smaller number of bank branches required.
- The concentration of specialist services in one center accessible through mobile phone, computer or bank branch.
- Cheaper staff costs.
- Greater customer satisfaction.
- May attract new customer.

4.6. Mobile/Digital Wallets

With the growing use of the Internet for purchasing, there has been further development of safer ways of paying for goods and service online.

Mobile wallet: digital container on a Smartphone designed to keep together and use payment cards, vouchers, tickets, receipts and loyalty cards.

Customers may use **smart cards** - plastic cards of the size of a credit card with integrated circuits built in and chips embedded in the plastic. Electronic cash is provided, with cards filled electronically at a bank's cashpoint or bought pre-filled or filled by using the telephone. They may use e-cash for buying small items. The customer has a digital wallet with a credited cash value to spend. Smart cards have many other uses - fare collection in **mass transit systems** such as the MRT system in Singapore, road toll collection, personal identification, driving licenses and patient card schemes as well as SIM cards in phones (Jazz Cash, Mobi Cash, easy paisa).

Another development is that every debit and credit card owned is put on the smartphone, so eliminating the use of plastic cards. A digital mobile app running on a phone or other mobile device

is designed to keep together and manage payment cards, tickets, loyalty cards, vouchers, and receipts - all the items that might be found purse or wallet.

This has been made possible by the use of the contactless payment card that uses the same technology as can be built into a smartphone. There is currently a limit to the amount that can be paid when using a smartphone for payment purpose. However, this limit will have to be scrapped if the mobile wallet is to be used for a range of payments both small and large payments.

The introduction of Apple Pay by Apple Inc. allows users of iPhones and other devices to make payments from their digital or mobile wallets and to keep payment information private from retailers. However, there are several other applications have been introduced that are capable of maintaining and paying the money electronically.

5. Role of digitalization in Financial Inclusion:

Financial Inclusion means that individuals of the underserved population have access to useful and affordable financial products and services to meet their needs (such as transactions, payments, savings, credit, and insurance), the concept is related to the unbanked and peoples from the underdeveloped areas having no formal access to banking services.

"Digital financial inclusion" can be defined as digital technology to provide financial services to the excluded and underserved populations. Such services should be suited to the customers' needs and delivered responsibly, at a cost both affordable to customers and sustainable for providers.

Financial inclusion status is more likely to improve through technological interventions as:

- Brick and mortar businesses are proving to be an uneconomical proposition for banks in rural or remote areas
- There are several distribution challenges due to localized constraints
- Conventional banking models are not feasible for the low size of transactions, deposits, loans, etc. in such low-income regions
- Several accounts are not economical in nature
- There is a lack of awareness of financial products if banks go for traditional mode, it will not be suitable in terms of cost and the benefit driven.
- There is a high requirement of skilled and trained manpower.

- Further, regulatory support, government initiatives and active participation of public as well as private participants could be key factors for enabling a successful transformation of financial inclusion.

Unbanked economies have tapped the potential of digital technology, particularly in the mobile space, to gauge the impact of technology-driven inclusion. In Kenya, nearly two-thirds of adults are active customers of mobile-based remittance and payment services. Although more than 20% of the population in Bangladesh uses mobile financial services, 50% of mobile phone users in Tanzania actively use the mobile money system. In contrast, India's non-bank account population is approximately 47% and 900 million mobile user groups, and only 1% to 1.5% of mobile users actively use cell phone funds. However, demand-side drivers and emerging digital ecosystems are still the keys to using digital channels to promote financial inclusion.

6. Future of Digital Banking (Trends and opportunity):

Consumer behavior is changing towards rapid adoption of digitization

Since the market has been exposed to innovative digital services that are inherently disruptive (e-commerce participants and e-government services), it is now betting to change customer preferences to move from pricing (discounts) to convenience and services.

Demographics is likely to create a large digitally savvy customer segment

A demographic dividend of any economy will drive the digital behavior of the masses. If the average age of the population is around 25 – 30 years, it is expected that the banks have a large segment of a digitally savvy customer base to bank the unbanked or underbanked.

Government incentives and support to promote digitization

Unbanked and underbanked areas of Pakistan can be targeted by banks through advanced technology. However, there is a huge space available for growth of financial inclusion if the government take initiative to support banking companies to use technology to serve the masses.

Increasing mobile penetration and smartphone usage

The penetration rate of mobile phones is about 90%, which may promote financial knowledge and integration because players are betting on mobile financial services. The increase in the share of smartphones and the drop in handset costs may increase acceptance, better service, and security.