

E-banking: An impact of Technology on banking sector in India

R Padma malini, Associate professor, MBA Dept.,SVIT college,hyderabad,Telangana,

Abstract: *with the globalization trends world over it is difficult for any nation big or small, developed or developing, to remain isolated from what is happening around. For country like India, which is one of the most promising emerging markets, such isolation is nearly impossible. With the emergence of implementing new technology in the banks and making use of technology by the all the stakeholders of the bank, the productivity has been improving drastically. The digital revolution promises extraordinary gains in the productivity of the banking industry; dramatic improvements in the quality of customer experience; and a fundamental shift in the nature and intensity of competition. Technology has been one of the most important factors for the development of mankind. Information and communication technology is the major advent in the field of technology which is used for access, process, storage and dissemination of information electronically. Banking industry is fast growing with the use of technology in the form of ATMs, on-line banking, Telephone banking, Mobile banking etc., plastic card is one of the banking products that cater to the needs of retail segment has seen its number grow in geometric progression in recent years. This growth has been strongly supported by the development of in the field of technology, without which this could not have been possible of course it will change our lifestyle in coming years.*

Keywords: *globalization, technology, digital revolution, productivity.*

I. INTRODUCTION:

E-banking refers to electronic banking. It is like e-business in banking industry. E-banking is also called as "Virtual Banking" or "Online Banking". E-banking involves information technology based banking. Under this I.T system, the banking services are delivered by way of a Computer-Controlled System. This system does involve direct interface with the customers. The customers do not have to visit the bank's premises.

Considering the traditional methods, banks delivered their products and services to their prospective customers through only physical bank branches.

However, the scenario of the financial services industry is changed with the advent of the internet, rapid technological evolutions, globalization and financial deregulations, liberalization and consolidation of the financial markets (Jeevan, 2000; Mia *et al.*, 2007). Many businesses are forced to change their traditional modes of operation and banks indeed are no exception to the abovementioned. As a result, financial services industry became much more competitive (Thornton & White, 2001). Banks realized that relying exclusively on the traditional modes of competition such as on price factors is difficult and in order to increase the revenue and market share, banks started looking at various options. It is evident that the largest expenses incurred by banks are maintenance of branch network associated with human resources in the form of overhead costs. Banks started to realize non-price factors such as distribution as an alternative strategy for differentiation, gaining competitive advantage and cost cutting (Daniel, 1999).

Rapid technological advancements coupled with the expansion of the global economy in the past two decades paved way for the transformation of the banking system role from traditional trade financing to mobilizing and channeling financial resources more effectively. In an intensifying competitive environment, superior distribution strategies concerned with how to communicate with and deliver products to the customer effectively provides a competitive advantage to the banking institutions in the market place (Kerem *et al.*, 2005). Customers are also demanding greater convenience and accessibility as reflected in longer branch opening hours and an increase in the choice of delivery mechanisms. Therefore, many banks globally have started to take initiatives to set in place more cost-effective alternative service delivery systems (Shih & Fang, 2004).

And the trend has been the proliferation of service delivery channels through which consumers can interact with the banks. Therefore modern banks provide their consumers with increased channel choice, reach out consumers through many routes. As such, ATMs, telephone, internet and wireless channels are now available to the consumers to perform their banking transactions in addition to the

traditional branch banking. Banks cannot go back in the future by reducing the number of channels as consumers have become somewhat accustomed to and indeed are utilizing a broad range of options (Durkin, 2004).

Therefore the present chapter attempts to address the objectives such as,

II. Objectives:

1. To understand the concept of ebanking.
2. To look at the popular services of ebanking.
3. To analyze the performances of technology in public sector and private sector banks
4. To identify the opportunities and challenges associated with ebanking.

III. E-Banking:

Internet banking (or E-banking) means any user with a personal computer and a browser can get connected to his bank -s website to perform any of the virtual banking functions. In internet banking system the bank has a centralized database that is web-enabled. All the services that the bank has permitted on the internet are displayed in menu. Any service can be selected and further interaction is dictated by the nature of service. The traditional branch model of bank is now giving place to an alternative delivery channels with ATM network. Once the branch offices of bank are interconnected through terrestrial or satellite links, there would be no physical identity for any branch. It would a borderless entity permitting anytime, anywhere and anyhow banking. The network which connects the various locations and gives connectivity to the central office within the organization is called intranet.

INTERNET BANKING IN INDIA:

The Reserve Bank of India constituted a working group on Internet Banking. The group divided the internet banking products in India into 3 types based on the levels of access granted. They are:

- i) Information Only System: General purpose information like interest rates, branch location, bank products and their features, loan and deposit calculations are provided in the banks website.

There exist facilities for downloading various types of application forms. The communication is normally done through e-mail. There is no interaction between the customer and bank's application system. No identification of the customer is done. In this system, there is no possibility of any unauthorized person getting into production systems of the bank through internet.

- ii) Electronic Information Transfer System: The system provides customer- specific information in the form of account balances, transaction details, and statement of accounts. The information is still largely of the 'read only' format. Identification and authentication of the customer is through password. The information is fetched from the bank's application system either in batch mode or off-line. The application systems cannot directly access through the internet.

- iii) Fully Electronic Transactional System: This system allows bi-directional capabilities. Transactions can be submitted by the customer for online update. This system requires high degree of security and control. In this environment, web server and application systems are linked over secure infrastructure. It comprises technology covering computerization, networking and security, inter-bank payment gateway and legal infrastructure.

ELECTRONIC INFORMATION TRANSFER SYSTEM AND FULLY ELECTRONIC TRANSACTIONAL SYSTEM:

Automated teller machine:

ATM is designed to perform the most important function of bank. It is operated by plastic card with its special features. The plastic card is replacing cheque, personal attendance of the customer, banking hour's restrictions and paper based verification. There are debit cards. ATMs used as spring board for Electronic Fund Transfer. ATM itself can provide information about customers account and also receive

instructions from customers - ATM cardholders. An ATM is an Electronic Fund Transfer terminal capable of handling cash deposits, transfer between accounts, balance enquiries, cash withdrawals and pay bills. It may be on-line or Off-line. The on-line ATM enables the customer to avail banking facilities from anywhere. In off-line the facilities are confined to that particular ATM assigned. Any customer possessing ATM card issued by the Shared Payment Network System can go to any ATM linked to Shared payment networks and perform his transactions.

Credit cards/Debit cards:

The Credit Card holder is empowered to spend wherever and whenever he wants with his Credit Card within the limits fixed by his bank. Credit Card is a post paid card. Debit Card, on the other hand, is a prepaid card with some stored value. Every time a person uses this card, the Internet Banking house gets money transferred to its account from the bank of the buyer. The buyers account is debited with the exact amount of purchases. An individual has to open an account with the issuing bank which gives debit card with a Personal Identification Number (PIN). When he makes a purchase, he enters his PIN on shops PIN pad. When the card is slurped through the electronic terminal, it dials the acquiring bank system - either Master Card or VISA that validates the PIN and finds out from the issuing bank whether to accept or decline the transactions. The customer can never overspend because the system rejects any transaction which exceeds the balance in his account. The bank never faces a default because the amount spent is debited immediately from the customer's account.

Smart cards

Banks are adding chips to their current magnetic stripe cards to enhance security and offer new service, called Smart Cards. Smart Cards allow thousands of times of information storable on magnetic stripe cards. In addition, these cards are highly secure, more reliable and perform multiple functions. They hold a large amount of personal information, from medical and health history to personal banking and personal preferences.

IV. Services of Ebanking

Bill payment services

You can facilitate payment of electricity and telephone bills, mobile phone, credit card and insurance premium bills as each bank has tie-ups with various utility companies, service providers and insurance companies, across the country. To pay your

bills, all you need to do is complete a simple one-time registration for each biller. You can also set up standing instructions online to pay your recurring bills, automatically. Generally, the bank does not change customers for on line bill payments.

Fund transfer:

You can transfer any amount from one account to another of the same or any another bank. Customers can send money anywhere in India. Once you login to your account, you need to mention the payees' account number, his bank and the branch. The transfer will take place in a day or so, whereas in a traditional method, it takes about three working days. ICICI Bank says that online bill payment service and fund transfer facility have been their most popular online services.

Credit card customers:

With Internet banking, customers can not only pay their credit card bills online but also get a loan on their cards. If you lose your credit card, you can report lost card online.

Investing through internet banking:

You can now open an FD online through funds transfer. Now investors with interlinked demat account and bank account can easily trade in the stock market and the amount will be automatically debited from their respective bank accounts and the shares will be credited in their demat account. Moreover, some banks even give you the facility to purchase mutual funds directly from the online banking system. Nowadays, most leading banks offer both online banking and demat account.

However if you have your demat account with independent share brokers, then you need to sign a special form, which will link your two accounts.

Recharging your prepaid phone

Now we can just top-up prepaid mobile cards by logging in to Internet banking. By just selecting operator's name, entering your mobile number and the amount for recharge, your phone is again back in action.

Shopping

With a range of all kind of products, you can shop online and the payment is also made conveniently through your account. You can also buy railway and air tickets through Internet banking.

Popular services covered under E-Banking

The popular services covered under E-banking include:-

1. Automated Teller Machines,
2. Credit Cards,
3. Debit Cards,
4. Smart Cards,
5. Electronic Funds Transfer (EFT) System,
6. Cheques Truncation Payment System,
7. Mobile Banking,
8. Internet Banking,
9. Telephone Banking, etc

Traditional banks offer many services to their customers, including accepting customer money deposits, providing various banking services to customers, and making loans to individuals and companies. Compared with traditional channels of offering banking services through physical branches, e-banking uses the Internet to deliver traditional banking services to their customers, such as opening accounts, transferring funds, and electronic bill payment.

E-banking can be offered in two main ways. First, an existing bank with physical offices can also establish an online site and offer e-banking services to its customers in addition to the regular channel. For example, Citibank is a leader in e-banking, offering walk-in, face-to-face banking at its branches throughout many parts of the world as well as e-banking services through the World Wide Web. Citibank customers can access their bank accounts through the Internet, and in addition to the core e-banking services such as account balance inquiry, funds transfer, and electronic bill payment, Citibank also provides premium services including financial calculators, online stock quotes, brokerage services, and insurance.

E-banking from banks like Citibank complements those banks' physical presence. Generally, e-banking is provided without extra cost to customers. Customers are attracted by the convenience of e-banking through the Internet, and in turn, banks can operate more efficiently when customers perform transactions by themselves rather than going to a branch and dealing with a branch representative.

In addition to traditional banks that have both a physical and online presence, there are several e-banks that exist only on the Internet, allowing users to work with a "virtual" bank. NetBank is such an Internet-only bank. Without physical branches, NetBank can cut operating costs and can potentially offer higher deposit rates to its customers and waive many fees normally charged by a bank with a large network of physical branches. The challenge for Internet-only banks is to provide quality customer services without physical offices. NetBank customers can deposit and withdraw funds from their NetBank accounts through these ATMs, and in addition, customers can also deposit and receive funds through wire transfer.

E-banking services are delivered to customers through the Internet and the web using **Hypertext Markup Language (HTML)**. In order to use e-banking services, customers need Internet access and web browser software. Multimedia information in HTML format from online banks can be displayed in web browsers. The heart of the e-banking application is the computer system, which includes web servers, database management systems, and web application programs that can generate dynamic HTML pages.

Bank customers' account and transaction information is stored in a database, a specialized software that can store and process large amounts of data in high speed. The function of the web server is to interact with online customers and deliver information to users through the Internet. When the web server receives a request such as an account inquiry from an online customer, it requires an external web application program to process the request. C, Visual Basic, VBScript, and Java are some of the languages that can be used to develop web application programs to process customer requests, interact with the database, and generate dynamic responses. Then, the web server will forward the response HTML files to e-banking customers. Several banks, such as NationsBank, also use state-of-the-art imaging systems, allowing customers to view images of checks and invoices over the Internet.

V. Challenges of E-BANKING

One of the main concerns of e-banking is security. Without great confidence in security, customers are unwilling to use a public network, such as the Internet, to view their financial information online and conduct financial transactions. Some of the security threats include invasion of individuals' privacy and theft of confidential information. Banks with e-banking service offer several methods to

ensure a high level of security: (1) identification and authentication, (2) encryption, and (3) **firewalls**. First, the identification of an online bank takes the form of a known Uniform Resource Locator (URL) or Internet address, while a customer is generally identified by his or her login ID and password to ensure only **authenticated** customers can access their accounts. Second, messages between customers and online banks are all **encrypted** so that a hacker cannot view the message even if the message is intercepted over the Internet. The particular encryption standard adopted by most browsers is called Secure Socket Layer (SSL). It is built in the web browser program and users do not have to take any extra steps to set up the program. Third, banks have built firewalls, which are software or hardware barriers between the corporate network and the external Internet, to protect the servers and bank databases from outside intruders. For example, Wells Fargo Bank connected to the Internet only after it had installed a firewall and made sure the firewall was sufficiently impenetrable.

The range of e-banking services is likely to increase in the future. Some banks plan to introduce electronic money and electronic checks. Electronic money can be stored in computers or **smart cards** and consumers can use the electronic money to purchase small value items over the Internet. Electronic checks will look similar to paper checks, but they can be sent from buyers to sellers over the Internet, electronically endorsed by the seller, and forwarded to the seller's bank for electronic collection from the buyer's bank. Further, banks seek to offer their customers more products and services such as insurance, mortgage, financial planning, and brokerage. This will not only deliver more value to the customers but also help banks to grow business and revenues.

Security precautions:

Customers should never share personal information like PIN numbers, passwords etc with anyone, including employees of the bank. It is important that documents that contain confidential information are safeguarded. PIN or password mailers should not be stored, the PIN and/or passwords should be changed immediately and memorized before destroying the mailers.

Customers are advised not to provide sensitive account-related information over unsecured e-mails or over the phone. Take simple precautions like changing the ATM PIN and online login and transaction passwords on a regular basis. Also ensure that the logged in session is properly signed out.

The other important challenges:

- Meet customer expectations on service and facility offered by the bank
- Customer retention
- Managing the spread and sustain the operating profit
- Retaining the current market share in the industry and the improving the same.
- Completion from other players in the banking industry.

VI. TRENDS IN EBANKING

- I. Banks are investing in Cyber security Systems with the Increase in Cyber Threats

Increasing digitalization and connectivity has triggered an increase in incidents of data breaches, compelling banks to strengthen their security systems

Background: Increased adoption of web and mobile applications in the banking industry has made the industry prone to advanced cyber attacks. The hackers have become more professional and expert in breaking barriers established via traditional security measures

Key Drivers: New technologies, increased digitization, and connectivity have increased the number of touch points for customers and have also increased banks' vulnerability to attacks. Financial incentives gained by hacking banks and the sophistication of their security makes banks a tempting target. Cyber attacks have become more complex, data breaches are growing in size and frequency.

- II. Banks are now increasingly moving toward public cloud-based banking infrastructures, as perceived security and regulatory risks recede

Background: Traditionally banks have kept close control of their IT, supporting large in-house teams and building their own data centers. This is set to change as banks are looking closely at the opportunities to reduce the number of data centers and save costs by implementing public cloud-based infrastructures. The banking industry has usually shied away from public cloud implementation due to shared infrastructure and its perceived security and regulatory risks. Major global banks are increasing their cloud investments, many big banks are now focusing on public cloud deployments

Key Drivers: Banks are facing the pressure to cut infrastructure costs and increase flexibility. Public cloud providers have understood the concerns regarding security and are now providing more security and compliance services. They have Shortened time to market for new products and services.

III. Banks Are Testing Augmented Reality to Provide Enhanced Customer Experience

Background: To keep customers loyal and continue using their service, banks are trying to adapt innovative ways for providing simple, convenient banking solutions for their customers. Customers nowadays have high expectations, demanding a certain quality of service, making it harder for banks to keep a competitive edge. Banks are focusing on adapting new technologies and finding innovative ways of delivering solutions to provide better customer experience

Key Drivers: Tech-savvy millennial are the core of banking consumers with evolving expectations. Mobiles have become more advanced with high-end processors and built-in sensors with AR applications.

IV. Banks Have Been Working Together to Identify and Understand the Use Cases of Distributed Ledger Technology

Banks are exploring distributed ledger technology applications by either collaborating, partnering with startups, or by creating incubators and innovation labs

Background: Although significant advances have been made in technology, banks today are still maintaining traditional ledgers to record transactions within their ecosystems. Despite efforts to reduce complexity, the mid- and back-office functions remain slow and inefficient—with electronic transactions that can take place in the blink of an eye still taking days to settle and reconcile. The networks are expensive and vulnerable due to the processes that underpin asset ownership and asset transfer.

Key Drivers: Banks are increasingly willing to explore the potential use cases of distributed ledgers, such as those used in block chain. The distributed ledger technology offers a high degree of transparency, faster settlement time, and broad process automation

V. Robotic process automation (RPA) is a highly efficient way to help banks reduce IT spending without compromising service provisioning

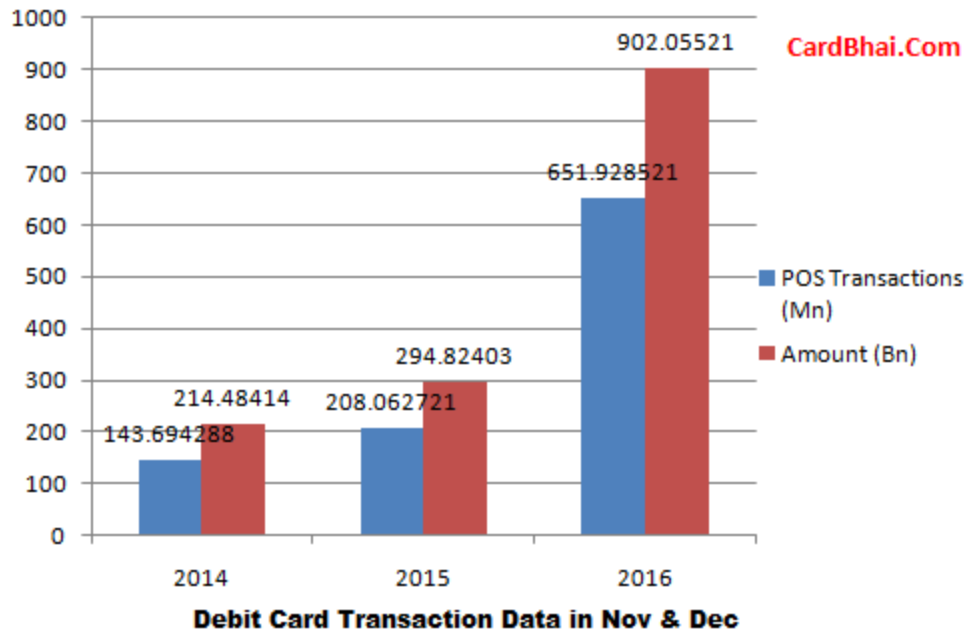
Background: The banking industry is facing considerable threats, internally and externally, leading to pressure on both the top and bottom lines. As banks face the threat of disruption, there has been an increasing focus on transforming their internal systems to stay at pace with external challenges, however, the complexity involved in legacy transformation is forcing banks to explore innovative ways to drive internal efficiencies

Key Drivers: Increasing competitive pressures and low-interest-rate environments are leading to thin margins and banks are exploring ways to improve their operational efficiencies to bring down cost/income ratios. Increased complexity of banking systems (presence of multiple legacy systems and challenges of data management across systems), is leading to streamline the processes and reduce manual intervention (straight through processing). As the cost of regulatory compliance is on the rise, the use of human intervention is becoming arduous and is prone to errors.

VI. DATA ANALYSIS

DEBIT CARDS

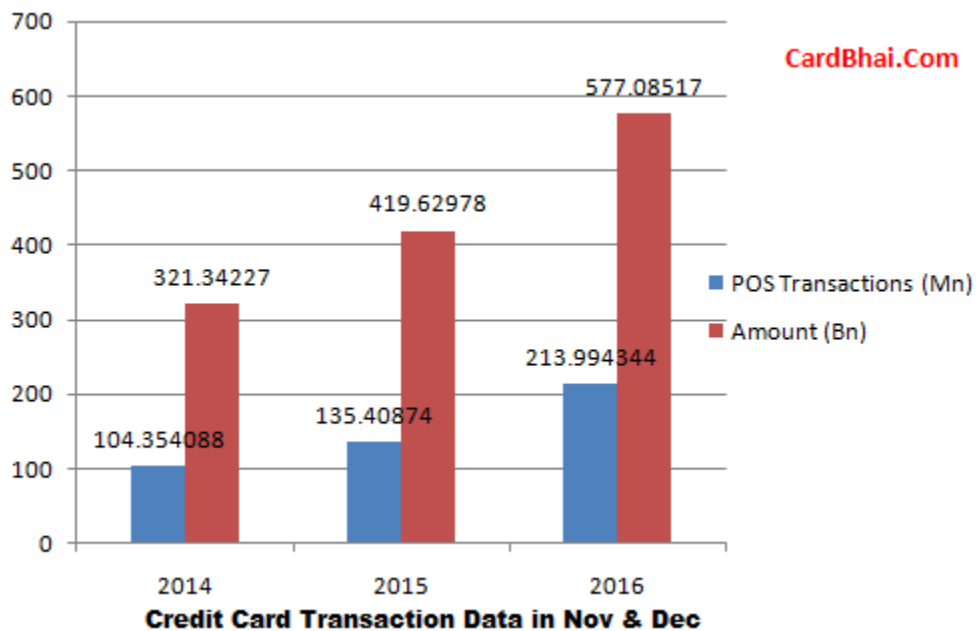
Total Debit Cards Outstanding at the end of Dec 2016 in India is a whopping 76,11,23,366. You can see that the Debit Card Transaction Volume and data saw a 300% spike in 2016 when compared to previous year.



From the above chart it is evident that Indians, who spent Rs 29,482 Cr in the months of Nov & Dec 2015 collectively, increased their spending drastically to Cashless Mode in the Month of Nov & Dec 2016 and spent a whopping Rs 90,205 Cr in 2016.

Total Credit Cards Outstanding at the end of 2016 in India is 2, 83, 21,039. Spending on Credit Cards during Demonetization of 2016 increased in Volume by 158% and Amount by 137% respectively when compared to Nov & Dec 2015 data. The following chart shows Credit Card spend of Indians in the months of Nov & Dec of 2014, 2015 and 2016.

CREDIT CARDS:



We know that Mobile Money was some contributing factor but RBI does not have accurate data on PoS transactions using Mobile Money thus the same has

been excluded from our study but we will definitely strive to get the data and present it to our viewers. It is time to go Cashless and Mobile when transacting.

Hopefully, the government will continue its initiative to eliminate Black Money forever.

MOBILE BANKING:

The Indian Internet ecosystem had its challenges in 2016, parts of fintech has seen continued strong momentum. The number and value of transactions through mobile wallets have been growing at over 30% and 100%, respectively, and the **mobile banking transactions**, in volume and value, have grown at over 150% and 250%, respectively (for the period April-October 2016). The number of wallet users has already surpassed the number online banking users.

The demonetization exercise has also helped these companies further, notably Paytm (the impact is not reflected in the numbers discussed above). It is yet to be seen if the **UPI (Unified Payment Interface)** app (called “BHIM”) launched by NPCI (National Payment Corporation of India) can pose a threat to wallets. While it directly connects bank accounts with a simple consumer interface, initial performance has been hit by glitches and the ability to sign up merchants is yet to be seen.

During the Demonetisation, **Paytm** has witnessed over 7 mn transactions worth US\$17-18 mn a day. It claims to have added 5 mn new users within two weeks of the demonetisation and has served over 45 mn in a ten-day period alone. Offline transactions now contribute to 65% of the overall transaction value for Paytm vs. 15% about six months back.

Another large player in the segment, Mobikwik, has stated that it has witnessed a 40% increase in its mobile application downloads since demonetization and user traffic has increased by 200%.

The wallet firms have been adapting to take advantage of these government initiatives. For example, there is an aggressive push to onboard **offline merchants**, making it easier for them to receive payments online, at very low fee or in some cases, free of cost. Also, the wallet users can transfer the money to their banks from the wallet at lower cost – 1% in the case of Paytm and for no cost in the case of Mobikwik and Freecharge (acquired by Snapdeal).

Competitive Private Banks like the HDFC Bank, Kotak Bank will also enter this space through their existing Mobile App to cater UPI as well as QR Code based payment mechanisms as they want a pie of every slice of Payment processing market from Online, Credit Card and now Cashless using the Mobile.

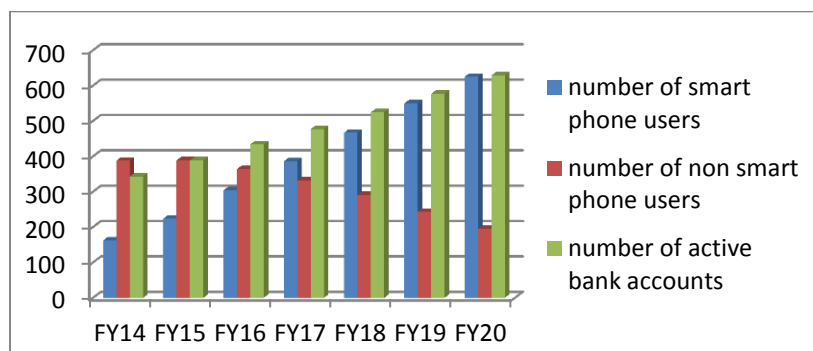
GROWTH IN ATMs

The geographic reach of ATMs increased further as the number of ATMs installed increased to around 0.2 million as at end March 2016, an increase of 9.7 per cent over the previous year. PSBs maintained more than a 70 per cent share in the total number of ATMs. FBs, however, continued to post a decline in the number of ATMs.

Sr.NO	Bank Group	On –site ATMs	Off-site ATMs	Total Number
1	Public Sector banks	34012	18277	15735
2	Nationalized Banks	24181	12773	11408
3	SBI Group	58193	31050	27143
4	Private sector banks	13249	22830	36079
5	New Private sector banks	9907	20401	30308
6	Foreign banks	3342	2429	5771
7	ALL SCBS	284	1130	1414

Source: RBI statistical source

Smartphones to become primary banking channel in 5 years:



Electronic funds transfer (EFT) is the electronic transfer of money from one bank account to another, either within a single financial institution or across multiple institutions, via computer-based systems, without the direct intervention of bank staff. EFT's are known by a number of names. In the United States, they may be referred to as electronic checks or e-checks.

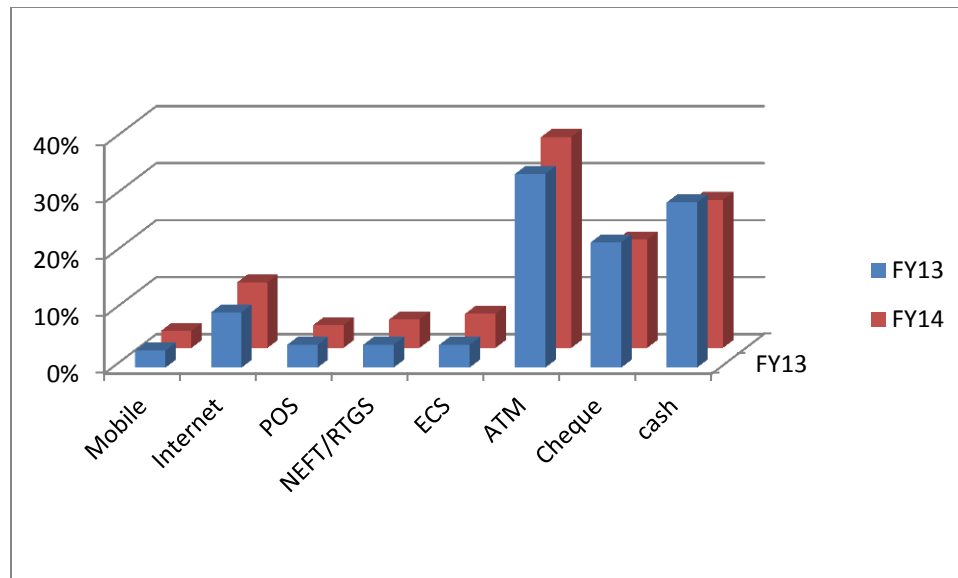
The term covers a number of different payment systems, for example:

- cardholder-initiated transactions, using a payment card such as a credit or debit card
- direct deposit payment initiated by the payer

- direct debit payments for which a business debits the consumer's bank accounts for payment for goods or services
- wire transfer via an international banking network such as SWIFT
- electronic bill payment in online banking, which may be delivered by EFT or paper check
- Transactions involving stored value of electronic money, possibly in a private currency.

EBANKING SERVICES	FY13	FY14
Mobile	3%	3%
Internet	9.70%	12%
POS	4%	4%
NEFT/RTGS	4%	5%
ECS	4%	6%
ATM	34%	37%
Cheque	22%	19%
cash	29%	26%

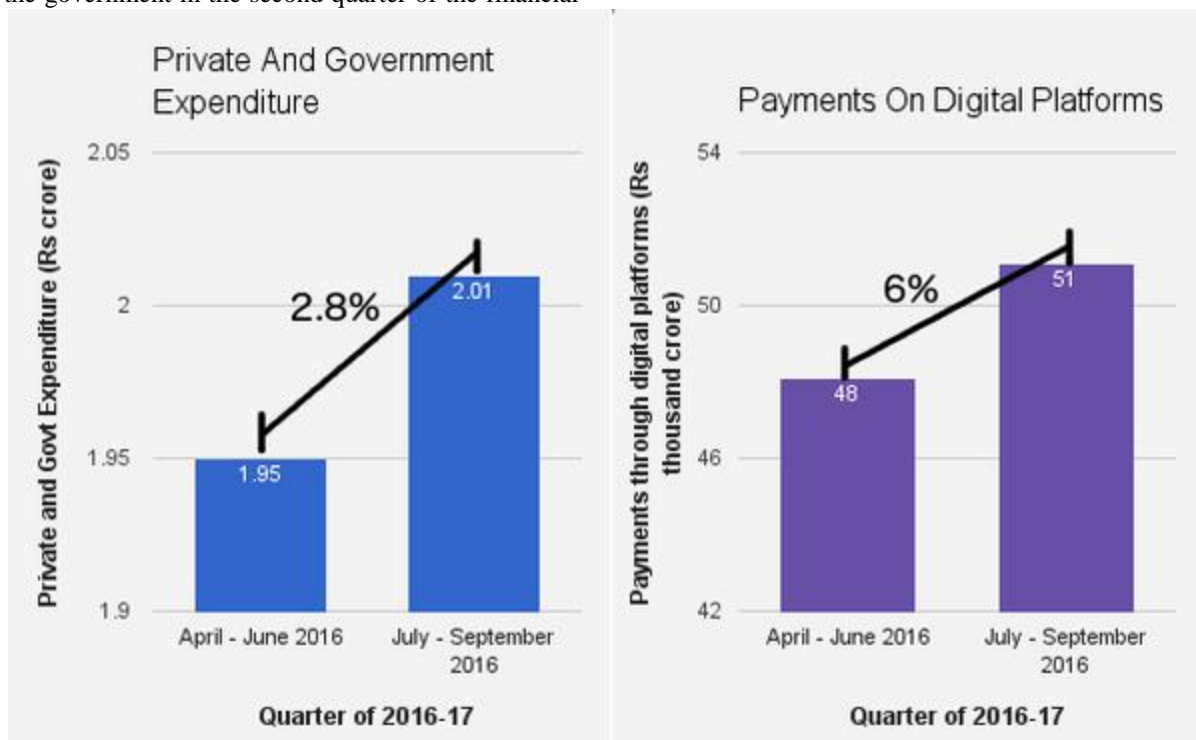
Source:RBI statistics



Digital transactions faster than growth in consumption

Consumption of goods and services by people and the government in the second quarter of the financial

year 2016-17–July 1 to September 30–grew 2.8% over the previous quarter (April to June), according to data from the central statistics office.



Source: Central Statistics Office; Reserve Bank of India

VII. Findings:

- Money transfers using mobile banking and immediate payment system (IMPS)–wherein money is transferred instantly using text

messaging or online banking–showed the highest increase in over 12 months ending October 2016. Mobile banking transactions grew 175%, while money transacted using

mobile banking grew 369% from October to October, according to an IndiaSpend analysis of Reserve Bank of India (RBI) data.

- Consumers used the Unified Payments Interface, or UPI, the mobile payments platform, released in August 2016, for 300,000 transactions amounting to Rs 90 crore in November 2016. The number grew to 1.4 million transactions, worth Rs 480 crore, till December 25, 2016.
- Over the same period, non-cash payments—NEFT, IMPS, PPI, mobile banking, point of sale (PoS) terminals and National Automated Clearing House (NACH)—rose 6%, showing that digital transactions rose faster than consumption. This suggests that cash transactions have been reducing since January 2016.
- Cheque transactions and payments remained largely unchanged over 2016, while money transfers using national electronic funds transfer (NEFT)—through which money is transferred in batches, after approval from the banks sending and receiving money—and transactions over Point of Sale terminals (debit card swipe machines) grew 16% and 35%, respectively, in 2016 (October over October), as compared to mobile, smartphone and app based payment platforms.

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