The Key words of present research work are ATM, Vulnerability and Security Issues.

First word ATM stands for Automated teller machine, a machine that allows customers of a banking institution to transact banking business without any help of a cashier i.e. human clerk known or human bank teller. Automated teller machine also called automated banking machine. In some part of world it is also known as hole in the wall or cashpoint or cashline. An automated teller machine is a computerized telecommunications device. With rapid growth in Information technology sector in from the past decade, daily new inventions are taking place in market. In financial sector especially the banking sector there are so many new technologies are taking place in financial operations. ATM is an important invention for banking sector. The innovations of modern and information technology have made it feasible for bank clients to interact and carry out banking facility with Automated teller machine and to receive the cash directly from the machine or make deposit including checks without assistance of human Being. Automated teller machine is part of Electronic banking and is new services which are being offered by at present by most of banks in core banking sector to its customers. Electronic banking offers other services also apart from Automated Teller Machine such as direct business deal purchase/sale through Point-Of-Sale (POS) and Telephone banking and so on. One of the main reasons for banks more inclinations toward Automated teller machine is day by day rising cost of setting up and operating bank branch whether full-fledged branch or extension counters and it has lead to sharp increase in Automated teller machine being installed by the banks. Automated Teller Machines have found its rapid popularity not only because of low in banks transactions costs but also due to customers convenience and thereby it is become need of the day in common men life. There is always two sides of a coin, the Automated Teller Machines which
facilitates the customers by providing better service is has also darker side. A number of customers have faced cheating and frauds through Automated Teller Machines by withdrawals, withdrawal from their account not transited by client himself and thereby customer have some time unpleasant experience by customers. It is challenge now for the manufactures of Automated teller machine how to minimize the frauds for keeping Automated teller machine in functioning with its popularity being kept intact.

The second term Vulnerability meaning risks to which Automated Teller Machines are open for misuse, abuse, damage and destructions by unauthorized person. The third term i.e. Security to Automated Teller Machines has to be understood along with vulnerability and dealt together as security of Automated Teller Machines is to minimize the vulnerabilities. As the Automated Teller Machines works without any human teller interactions, it is designed with large number security features so that a costumer can perform banking financial transactions without any problem with secure transactions but there are some vulnerabilities, which make the transaction unsuccessful and/or transactions carried by unauthorized transactions using Automated Teller Machines. This research analyze such vulnerabilities and security issues of the being faced Automated teller machine and advance suggestions so that Automated teller machines functions in enhanced and protected environment.

The core subject of this thesis is the analysis of vulnerabilities and security issues is an analytical design of a generic process framework along with a novel approach for providing security towards the Automated Teller Machines and its transactions. In this introductory chapter, the necessary background is provided by examining the recent past, evolution and the vulnerabilities have occurred in Automated Teller Machines and transaction and various security issues and future trends of the new secure authentication and transaction authorization. This study is an analysis of various vulnerabilities/attacks/ weaknesses and threats found in Auto teller Machine and its transactions.

The first step in the present study is to identify the all types of vulnerabilities related to Automated Teller Machines and its transaction security aspects as identified at the analysis and related security issues towards their technical aspects as emerged during the research phase. These challenges are presented in this study. In next phase of this study we analyze various security
issues and related solutions related to Automated Teller Machines and its transactions security to provide the existing security solutions available in current scenario together with a detailed analysis on the research topic. Finally, in this research we proposed conceptual frameworks (model) for prevent the unauthorized access of Automated Teller Machines and enhanced the security towards illegal or unauthorized access of banking transactions. Finally in the conclusions the practical deliverables of this thesis are summarized, along with the possible solution and with an open research area for further research.

1.1 WHAT IS ATM

ATM is an abbreviation used for Automated teller machine to be used by bank clients to process account/bank transactions through the machine. In early days, customers had to insert punched cards in to Automated Teller Machines for withdrawing cash. These punched cards were for single use and not returned to clients, so for clients using Automated Teller Machines frequently, he/she had to request for issue of number of cards at the same time. With development in information technology, punched cards have given their way to multiple use plastic cards known as ATM cards. There are two types of card issued by the banks to its clients namely Debit Card and Credit Card. Debit cards are linked directly bank account of customer, whereas withdrawals by Credit Card are money received in advance and attracts interest from the moment cash is withdrawn and thereby a source of income to the banks. For transacting business a user has to insert a special plastic card into the Automated Teller Machines, the plastic card has encoded with information on its magnetic strip, which an identification code individual to every card and he Automated teller machine transmits the code to the bank through modem and thus client is connected to the bank. It is essential for the card user to enter personal identification number (PIN) the keypad of the Automated teller machine. personal identification number (PIN) is a number allotted to individual client to prevent its use by unauthorized person. The computer of the bank then permits the Automated Teller Machine user to go ahead to complete the transaction; Most of Automated teller machines are capable to dispense cash and also can accept deposits. Automated teller machine can also transfer funds as well provide information regarding balance in connected account. Banks have entered in to agreements with other banks and therefore use of Automated teller machine is not restricted to bank to which it belongs but a customer of any bank can use an Automated Teller Machines
of any bank to withdraw cash. A customer having a coded card can carry banking from any Automated teller machine.

Automated teller machines are at present connected to interbank to enable the user perform banking operations like to withdraw and deposit money from machines. Use of Automated teller machine with connections to network has not only allowed customer of one bank to use Automated teller machine of other bank but also with connection to international network, a customer can use Automated teller machine in another country dealing in altogether different set of currencies and thereby it acts money exchanger also allowing customer withdraw cash in local currency from where he withdraws the money. For this purpose Automated teller machine are linked to interbank networks include such as STAR, BancNet, Cirrus, AFFN, MegaLink, LINK, NYCE, PULSE, PLUS, Interac and Interswitch, Automated teller machine has to rely up on the authorization for the financial transactions of the card issuer i.e. authorizing via the network. This act is usually performed through a messaging system called ISO 8583 [1].

Some of the banks charge fee for using Automated teller machine. many banks permit a fixed number of free transactions at its own Automated teller machine and certain number of free truncations on Automated teller machines of other banks and chargeable fee after these limited transactions. There are banks who charge fees solely to users who are customers of the other bank than to which the Automated teller machine belongs. To allow diverse range of devices, Automated teller machine has to be attached to their networks. There are some interbank networks, who have laid down passed rules for the expanding the definition of an ATM and its terminal by either having a vault within its footprint or bank draws currencies from the vault or cash drawer owned by the merchant establishment for withdrawing from a scrip cash dispenser.

1.2 E-BANKING AND ROLE OF ATM IN BANKING:

E-banking is an abbreviation for electronic banking. E-banking is generally implies for a service which allows customers to have account-specific information and also possibly conduct transactions from a remote location using computer equipped with network. A user can use this facility from any remote locations be it home or ones workplace[2]. It allows a client to conduct online bank transactions and the client need not to visit either his own bank or need of visiting an Automated teller machine. E-Banking is the automated delivery replacing traditional
banking system and fulfills the customers requirements through electronic facilities i.e. e-network which is interactive channels for communication. E-banking is a systems of banking enabling financial institution and its customers, be it individuals or businesses establishment to have access its accounts, freedom to transact business as well to obtain information of the financial products and services using network either private or public. Internet. Customers can have access to e-banking services which uses intelligent electronic device. Such electronic device may be a personal computer, or a personal digital assistant or an automated teller machine or electronic kiosk, with touch tone telephone facilities. Electronic banking is also called on its function as electronic funds transfer (EFT), thereby transfer funds directly from one account to another account by using simple electronic facilities.

1.3 ATMs

Before going into history of ATM, the expression of the ‘teller’ needs to be explained. A teller is specifically trained personnel of a bank having authorization to deals directly with the customers for transacting banking operation. Earlier it was cashier who use to dispense after completion of formalities by others and so teller jobs require fast cash handling and need a lot of experience. Need of teller was felt with growing work in volume of works by the bank and primarily for small cash withdrawals, the presence of large number of clients especially at peak hour. The normal steps for the bank transaction of withdrawing cash is that a client presents his check at designated counter, the clerk at the desk examines the check for some parameters and issues a token as receipt of the check, check travels to another employee of bank having ledger of account of the clients and verifies that balances are available to meet the amount desired in check for withdrawing, check further travels to another officials who compares and verifies the signature of client on the check from the record of bank and authenticate for cash delivery or sends to another official if more actions is required, finally check travels to cashier, who delivers cash in lieu of token issued by the bank clerk against the check. Thus withdrawal of cash is lengthy and time consuming process and results large numbers of clients waiting for their turn to receive cash. Unscrupulous persons take benefit of situation and cheat the clients in number of ways including pick pockets. To over-come the systems and cut down the time consumed in cash withdrawals banks introduced the system of “teller”, wherein a single person shall receive the check, do the needful entries and dispense the cash. The banks made available these
Introduction

facilities to clients withdrawing within certain limit of cash to minimize the risk of fraudulence to bank at the same time to fasten the system of cash dispensing along with cost to the bank as a single teller can materialize large numbers of clients effectively in short duration. At present also, some the banks work on regular system of bank transactions other work on teller system i.e. one window system. The development in the system with computerization of bank is that teller has access to balance available in particular account of the client, client signature in record of bank and photographs of client at click of the button; so the teller system has added security against fraudulences from the past, still teller in the bank refers the matter before payment to higher up if the amount is above the limits to be dealt by teller of the bank or teller finds any other anomalies.

Necessities to replace the human teller with machine paved the way to invention of the Automated Teller Machine. Automated Teller Machines is gaining importance to become a necessary in a routine part person for carrying banking transactions than when in the 1960s Automated teller machine was introduced it was part of a developing technology. Credit to develop first automatic teller machine in the USA goes to Luther George Simjian, who built the machine, which failed to dispense cash. Strong evidence are on record to point that Simjian had worked on a device as early as in 1939. On 30 June 1960 Simjian had filed for the patent machine which registered at 132nd with US numbered as US3079603, and he was granted patent for his machine on 26 February 1963. Bankograph as the machine was then called out, rolled out with delay of few years, since part of Simjian’s Reflectone Electronics Inc. had been acquired by another company known as Universal Match Corporation. In New York City in the 1939 by the City Bank of New York the experimental version of Bankograph was installed, but the machine had to be removed in 6 months as the machine failed to attract the customer for acceptance. The Bankograph too was an automated machine designed to receive deposits to accept the coins, the currencies and checks and machine had no features to dispense cash.

Kingsdale Shopping Center situated in Upper Arlington, Ohio had the opportunity to have the first Automated teller machine being put into operation in 1959 for automatic deposit. This suburban part of Columbus Ohio had created a shopping center where farm known as the Galbraith Farm was located. This farm is also known for having first THE LIMITED STORE of the world.
In almost same time, engineers of other countries viz Sweden, Japan and Britain trying to developed their own versions for dispensing and receiving cash through machines. Barclays Bank has the privilege to have placed first machine for use on 27 June 1967 in Enfield Town in North London, UK. This machine was first used by English comedy actor Reg Varney in the UK. It was out of marketing strategy at the time to gain maximum publicity for the popularity of machines so that machine becomes part of the mainstream in United Kingdom. John Shepherd Barron of De La Rue printing firm has been decorated with OBE in the 2005 New Year honors and has been credited for the invention. John Shepherd Barron design accepted paper checks which has to be issued by a teller after marking with carbon-14. Such a step was required for machine readability and security and was a process for matching with a personal identification number.

Banks in many other countries had also started introduction of self-service terminals, mainly to carry out functions of cash withdrawal. The long-term goal which was felt then was to provide better service to the customers and the same time attempts were made to lower the banks operational cost. Result was introduction of Automated teller machines to the world in year 1983 [3]. Modern technology was well received by users because they felt that it had made it possible to access money for them to with use of their credit cards or debit cards that too for 24 hours a day on a quick and simple system. Automated teller machines had also made it possible for a person to travel with safety as it one had not to carry huge amounts of cash during travel but instead, one could have access to money anywhere whether within the country or worldwide only thing one needed is ATM card and Automated teller machines. At present Auto Teller Machines has become part of everyone life. They facilitate the customer to carry out banking business outside the bank in variety of places as per individual connivance both in timing and volume. Automated teller machine is basically electronic unattended banking outlet; an outlet which allows its customers to complete banking basic need of transactions but without direct branch to interact or a branch official or teller. Automated teller machines is one of the best use of robotic science, wherein a machines interacts with machine and is able to transact his financial needs with help of Automated teller machines and that too he need not visit a bank for carrying transactions.
James Goodfellow in Scotland has been credited to hold a patent dated of 1966 to service Automated teller machines and is even earlier than John Shepherd-Barron’s first machine was installed in 1967 in Barclays Bank branch outside of north London. The first modern Automated teller machines put into use in December 1972 in the United Kingdom and the model was the IBM 2984, which was designed at request of Lloyds Bank. The 2984 model or CIT (Cash Issuing Terminal) was the in fact first true Cashpoint and even today what is in use is upgraded version of the same; Cashpoint is registered trademark of Lloyds TSB in the UK [4]. All the business was online and variable amount issued was immediately deducted from the clients account. Small number of 2984 machines were supplied to a US. Another well known historical models of ATMs which had gained popularity are the IBM 3624 and 473x series as well as Diebold 10xx and TABS 9000 series and NCR 1780/ NCR 770 series [5].

Today, ATMs have been popularized across the globe. The Automated Teller Machine has by now become part of daily life. At present it may sound strange to imagine this machine was ever part of cutting-edge technology. In the 1960s, by installations of the first cash-dispensing Automated teller machine at Barclays Bank branch in London [6], the revolutionary era had entered and in decade to follow the Automated teller machines took over functions much more than just the cash dispensers. The Automated Teller Machine also allow its customers to perform a range of banking activities such as deposits of cash and checks, mobile phone top-ups etc. The popularity gained by Automated teller machine can be gauzed from the data that over 160,000 Automated teller machines were installed by 1997 across the United States of America only.

Given that the Automated teller machine has become a prominent feature in daily lives of people’s, it’ is a matter of importance to understand the background, technical development and capacities of modern day Automated teller machine and that is why here is a quick introduction of Automated teller machines with its global significance.

Though the first encoded card-accepting Automated teller machine had been introduced by bank of Barclays in London in 1968, but in fact 1968 introduction was not the very first incarnation of the Automated teller machine. in 1960 [7], it was Citi Bank, then known as First National City Bank, who are credited for launching a version of the Automated teller machines
then called the Bankograph in American branches. However, this the Bankograph did not let its customers withdraw money from the machine but instead, the machine allowed users to pay bills automatically needing no bank staff. Barclays’ 1968 version of the Automated teller machine was not foolproof further cards were swallowed by early Automated teller machines on regular basis.

Figure 1.1 an ATM kiosk in semi-urban area

The Hongkong and Shanghai Banking Corporation is credited with introducing the ATM concept in India, who had installed their first machine way back in 1987 at Mumbai in India. According to a news published by Times of the NPCI, which has been promoted as an umbrella organization for retail payments by the Reserve Bank and banks, said as of end of October 2013 the total number of Automated teller machines stood at 1,04,500; out which 59% of Automated teller machines belong to single group of public sector namely State Bank of India. Now the Automated teller machines’ presence is not restricted to metropolitans of India but has spread to urban and semi urban area and it has penetrated not only to all districts head quarters of India but to lower level than the districts head quarters through spread of Automated
tellor machine by various public sector and private sector banks. According NPCI, with rise in popularity of the Automated tellor machine, number of such machine is expected to cross two hundred thousand mark within next 4 years i.e. double from the present number. Popularity of Automated tellor machine can be gauged from the long queue of waiting clients outside an Automated tellor machines kiosks.

![Figure 1.2 Rush at ATM kiosk on day of strike](image)

Advancement in Automated tellor machine has taken a leap in India by installation of first Automated Teller Machine (ATM) responding to sound for visually impaired and had been inaugurated in Ahmedabad in 2012, a machine which belongs to Union Bank of India another public sector bank which has over 4000 Automated teller across the countrywide in its network. In fact the Blind Association had approached the banks and as well as Automated teller machine owners and manufacturers to improve the Automated teller machines to make it easily assessable and reliable for visibly impaired users. Based on the 1992 Americans Disability Act Accessibility Guidelines (“ADAAG”) suitable modifications were required to render Automated teller machines to be accessible and independent use by persons having vision impairments. ADAAG regulates provisions of the technical requirements to make Automated teller machine facilities accessible to visually impaired. The related regulation interprets in line with the Americans
Disabilities Act (“ADA”), has been notified by the Department of Justice and pointing to the facilities which must be accessible. Automated teller machine manufactures not only directions for authorities but work for the accessibility to enlarge the category of Automated teller machines users worldwide and adding to the popularity of the Automated teller machines.

Banks had launched Automated teller machine in India in 1988 with machines functions of cash dispensation along with cash collection. Automated teller machine gained the popularity of its use in the next decade i.e. 1990’s and continued with system. However the Automated teller machine did not function of check collections and therefore a drop box was placed to Automated teller machine for users to drop the check in the box. With passage of time, banks discontinued the system of cash collections by the Automated teller machine and at present it is very hard to find even check drop box in within Automated teller machine housing.

1.4 GROWTH OF THE ATM

Growth of Automated teller machine in India since its introductions has been has been illustrated by the table below:

<table>
<thead>
<tr>
<th>Period</th>
<th>Features/functionalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1988-1994(Initial period)</td>
<td>Deposit of cash, Withdrawal of cash</td>
</tr>
<tr>
<td>1995-1999(development period)</td>
<td>Mini statement, Balance enquiry</td>
</tr>
<tr>
<td>2000-2001(First extension)</td>
<td>Coupon dispensing</td>
</tr>
<tr>
<td>2002-2004(Extended extension)</td>
<td>Fulfilling request from customer (eg. Check book)</td>
</tr>
<tr>
<td></td>
<td>Touch Screen Menus/ Facilities, Account transfer</td>
</tr>
<tr>
<td>2004-2006(non-banking service)</td>
<td>Bill Payments, Mobile Recharges, Ticket booking, Railways and Airlines</td>
</tr>
<tr>
<td>2007 onwards</td>
<td>Customized ATM, Check deposit with scanning, Biometric ATMs</td>
</tr>
<tr>
<td>(future)</td>
<td>Ubiquitous Multifunction’s</td>
</tr>
</tbody>
</table>

Table 1.1 : the ATM’S technology diffusion in indian banking

Source : Kumar, L. Malathy, D & Ganesh L.S.;., Journal of Economic Studies 1
The Global ATM Market and Forecasts up to 2016, the maximum growth of Automated teller machine has been noticed in Asia Pacific region. India and Indonesia have the share of one fourth of the number of Automated teller machines, and China share in growth accounts for almost half of the New Automated teller machines in the region. Steadily increase in Automated teller machines has been noticed worldwide. The growth of Automated teller machines in European countries and other advanced countries seems to reach at a saturation point. But there is a lot of scope of growth of Automated teller machines industry in developing countries like India. In India, Automated teller machines industry is growing at an exponential rate. In other words Automated teller machines has brought a self service revolution. Mr Jaivinder Gill, MD of NCR India has stated, “As banks continue to open new branches, attract new customers, and encourage existing and new account holders to use cards, the Indian Automated teller machines industry is set to grow. Since many banks still operate proprietary networks, the increasing number of banking customers is likely to spur Automated teller machines growth.” Automated teller machines technology has been effectively used to reach the customers is at affordable cost to bank or low wherever transaction cost is passed to customer and it is hassle free services. On an interaction with senior general managers (South Asia channel partners and strategic alliance), Automated teller machines segment witnessed a growth rate of 30% since last 5 years in India. ATM terminals in India will be expected to grow at a compounded average growth rate of 25% between 2011 and 2015. Growth up to 2010 with projected growth up to 2016 of Automated teller machine industry is given in the table below:

<table>
<thead>
<tr>
<th>YEAR</th>
<th>NO of ATMs</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>16750</td>
</tr>
<tr>
<td>2006</td>
<td>21509</td>
</tr>
<tr>
<td>2007</td>
<td>27088</td>
</tr>
<tr>
<td>2008</td>
<td>34789</td>
</tr>
<tr>
<td>2009</td>
<td>43651</td>
</tr>
<tr>
<td>2010</td>
<td>60153</td>
</tr>
</tbody>
</table>
Automated teller machines by now have got wider reach in rural and remote corners of the country. There is also a huge demand from the urban population who are looking for instant services, alongside seeking to avail more value-based features. As per Reserve Bank of India, for Automated teller machine industry, India has a huge market. It is a place with 1.2 billion people, where 40% of them were unbanked. ICICI Bank General manager OP Srivastava has commented on the issue, “When we saw a man in a dhoti in a remote town in South India withdraw money from an Automated teller machine, tuck it in the folds and ride away on his cycle, we were truly inspired by the Automated teller machine growth in the country.” The Automated teller machine Statistics computed by Reserve Bank of India, total number of onsite and offsite Automated teller machine of all Indian Banks are 100042 by July 2012 beating the expectation by a large margin.

Graphic representation of growth of Automated teller machine shows that growth in India had been almost 29% between 2005 to 2010 and though projected growth estimate for period up to 2015 is 24%, however actual growth by 2012 December 2012 has beaten the estimate by a margin of over 10% and therefore it is likely that growth shall be faster than the estimate.

<table>
<thead>
<tr>
<th>Year</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>74743</td>
</tr>
<tr>
<td>2012</td>
<td>92455</td>
</tr>
<tr>
<td>2013 (forecast)</td>
<td>114364</td>
</tr>
<tr>
<td>2014</td>
<td>141465</td>
</tr>
<tr>
<td>2015</td>
<td>174988</td>
</tr>
</tbody>
</table>

Table 1.2  ATM’s growth in India

Source: Edelwess IB Estimates
Introduction

1.5 ATM MANUFACTURERS AND SERVICE PROVIDERS

There are two types ATM service provider known as brown level and white level ATMs. In brown level Automated teller machines the hardware of machine and its accessories with the lease has to be owned by the service provider. However the connectivity, management and cash handling are to be dealt by the sponsor bank in the responsible manner. Such Automated teller machines do carry the logo of the sponsor bank with brand name. Under this model network has to be shared by banks thereby resulting in drastic cutting of costs within banks. These Automated teller machines have two major advantages. First advantage, in this model is that the capital investment has to be undertaken by the Automated teller machine vendors and thus relieves the banks from locking own their funds as a depreciating assets. Secondly, vendors receive a fee from bank for each transaction from bank whose card is used. This works as an incentive and improves efficiency of the usage. Another advantage is that of the speed of Automated teller machines deployment is increased once the brown level Automated teller machines service providers take the responsibility to identification of Automated teller machines installation at site, providing connectivity and power arrangement, negotiation with landlords, and finishing the interiors of Automated teller machines kiosks. Banks may or may not have the core competencies to handle these issues and save their man power in organizing them. NCR, Diebold and Wincor Nixdorf are leading original Automated teller machines manufacturers in India and there are other Brown level Automated teller machines service providers also, which are connected with Indian Banks. Now there is a trend in India, to outsource Automated teller machines functions and activities like; Automated teller machines selections and installations of
machine, keeping up of site, issuance of the cards and its management, transaction processing, field services, and to provide technology solutions to connect issuance by service providers.

White Level ATMs: In case of White Level Automated teller machines, non banking entities have been permitted to set up as well own and also operate the Automated teller machine. According to Reserve Bank of India’s Guidelines, minimum net worth necessary for non banking entities to set up Automated teller machines services should be minimum of 100 Crores. White level Automated teller machine providers can provide services to all customers of all banks to increase the clienteles. White level Automated teller machine operators are “acquirer” for all transactions in financial terms at a White level Automated teller machines and earn fees correspondingly. White level Automated teller machine operators are being permitted to earn extra revenue through advertisement at White level Automated teller machine counter and kiosks and also by offering value added services. Reserve Bank of India has allowed for placing of the advertisements on such White level Automated teller machines are on condition that such advertisement must confirm regulations set by Advertising Standard Council of India and under its codes and regulations. The operator has to choose and tie up with a sponsor bank. The Sponsor bank has to bear the discharge the responsibility as the settlement bank for transactions made at the White level Automated teller machines. In this case the maintenance and servicing of Automated teller machine becomes the responsibility of operator. Settlement of complete transactions at the Automated teller machine has to be done in only one book, the book of the sponsor bank through which the Automated teller machine establishes connectivity’s with Network for the operator. Cash Management at the White level Automated teller machines has to be responsibility of the sponsor bank. RBI allows freedom to the sponsor bank for tie up with other banks as well for loading off cash and reconciliation of cash at White level Automated teller machines, at locations where the sponsor bank does not have a premise. There is a huge opportunity and scope for growth of Automated teller machine market in India. The future will see multi vendor Automated teller machine gaining popularity and it is now capable of personalized branding, CRM applications, integrated fraud alerts, customer notification and other flexible services. Though Automated teller machine industry is growing rapidly, there are many challenges related to security issues related to the software, increase of rental costs by the day in major cities, housekeeping, and timely replenishment of cash. Few
banks have introduced biometric Automated teller machine in rural India, which are quite secure and easy to use by a common man. Banks are trying to shift slowly from multi vendor to multi channel integration, so as to get a complete picture of the activities of customers.

<table>
<thead>
<tr>
<th>Company</th>
<th>Offered services</th>
<th>Nos of ATMs served</th>
<th>Key tie ups</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCR</td>
<td>ATM manufacturing, ATM Management</td>
<td>n.a.</td>
<td>SBI, Axis Bank, HDFC Bank, Canara Bank</td>
</tr>
<tr>
<td>Diebold Systems</td>
<td>ATM manufacturing, ATM Management</td>
<td>n.a.</td>
<td>SBI, Axis Bank,</td>
</tr>
<tr>
<td>Wincor Nixdorf</td>
<td>ATM manufacturing, ATM Management</td>
<td>n.a.</td>
<td>SBI, ICICI Bank, Punjab National Bank, Axis Bank and Union Bank of India</td>
</tr>
<tr>
<td>FSS</td>
<td>Complete ATM Management(ATM Selection and Installation, Site up keeping, Cash Optimization &amp; loading)</td>
<td>15000</td>
<td>SBI, ICICI Bank, HDFC, IDBI</td>
</tr>
<tr>
<td>Prizm Payments</td>
<td>ATM Selection and Installation, Management of ATM Network, Provide Technology Solutions to connect ATMs</td>
<td>8500</td>
<td>Axis Bank</td>
</tr>
</tbody>
</table>

**Table1.3 ATM manufacturers & their service**

*Source: tsi.swishdesign.com.*
Introduction

Rise in popularity of use of Automated teller machine has also increased the risk of frauds taking place with Automated teller machine transactions and even police have not been spared. According to Times of India several victims 37 customers (including 15 cops) had contrasting experiences were affected due to hacking of their account and the police officials belonged to Mumbai Police head quarter whose salary accounts were hacked and amount siphoned off out of India as amount was withdrawn in Greece. Bank spokesperson said the money is reversed after a probe. “Various aspects have to be considered. If the PIN or the 3D secure code is compromised, it is the customer’s responsibility”.

But all the customer confronting the fraud are equally lucky, Mr Soumen Majumdar, director of a city-based shipping company has to say “It took over 60 days for the same bank to revert the fraud transactions of over Rs 1 lakh on my credit card in the US”.

In another case Ankur Korani, the director of a Mulund cosmetics company, lost over Rs 1 crore from his firm’s current account on January 31, 2012 and six months later, he has got back only about 60% of the amount. Ankur Korani is yet to recover his entire money, which seems to distant dream since the bank hasn’t bothered to revert back on the rest of the sum and intends to washed its hands and therefore Mr Korani is contemplating to take legal steps against the bank.

Another reported case in print media by times group is that Mr Joy Kutty, associate professor of SNDT Women’s University Mumbai, had to battle to get back Rs 88 thousand that was siphoned from his saving account on February 27, 2013. After repeated following it took three and a half months for the bank to put the money back in his account, but after deducting some Rs 500-odd. It was a tough fight for Mr Joy Kutty. When Mr Joy Kutty approached bank with the complaint, bank official made him to run around by putting the blame on the customer instead of accepting their own mistakes. Mr Joy Kutty did not receive co-operation from police too. Azad Maidan police station initially registered only a case of cheating. Only later did they add the sections meant for banking e-fraud. Such an ordeal diminishes the faith of uses in functioning of Automated teller machine.

Incidences of fraud encountered by the Automated teller machine is showing a rising trend globally. US, Britain and several other countries in almost all part of continents was busy in
investigations related to these crime. Magnitude of frauds can seen from a report frauds had been able defraud the genuine automated teller in a cash machine scam for an amount over $45m (£29m) and frauds are spread all over the globe related to this scam presently the largest reported scam. Credit for unearthing this scam goes to US authorities for having brought in to light the scam of $45-million ECS and another company, enStage Inc, which operates from Bangalore. The two firms, who were connected with processing of the card for payments to two West Asian banking organizations were also not spared. ECS said investigations show “the PIN and Magnetic stripe data seem to have been compromised outside the ECS processing environment” and added, “As already reported in the media earlier this year, there were fraud attacks which affected several institutions worldwide, including ECS, in December 2012”.

Investigative agencies do not full have powers and have little resources, like sufficient staff, while banks have the funds but no statutory power. It’s necessary to integrate resources with powers. All banks must come together and embark on this venture by pooling in their expertise and financial resources,” is an expert advice by a lawyer who used to be an IPS officer.

Victims of ATM credit/debit card fraud face an uphill task first to lodge the complaint and second fighting with the banks to get the money reversed to his/her ATM card account siphoned fraudulently. Victims are confident where and to whom they should approach with so that they stop the fraudulent transaction or to get the siphoned money. They first have to contend with stonewalling from banks and then police, who often make them do the run-around to register the official complaint i.e. First information Report or FIR. Banks should come out with advanced technology to tackle the menace of banking and card frauds that have moved to a different level.

Former IPS officer turned lawyer said the investigative agency has got powers but no resources such as large staff. On the other hand, the banks have got funds but no statutory powers. What is of dire necessity is to integrate resources with powers. It is important that all the banks come together and embark upon this venture by pooling in their financial resources and expertise together.
1.6 ATMs’ PROCESSING CONCEPT

Processing at an Automated teller machine consists of the following:

Automated teller machine may contain normally two input devices. Usually Automated teller machine have four output devices to facilitate its user and may vary with models. The Automated teller machine works like any other data terminal. The Automated teller machine connects to host processor for communicating to make transactions. Central Processing Unit or CPU has the control of the user interface and transaction devices. Cards having magnetic stripes or Chip have to go through a Card reader either by swiping or by inserting to establish the identification of the customer/user. Input device of PIN Pad resembles in layout and look like a Touch tone or Calculator keypad. Processing device named the Secure crypto processor processes information [8]. Display panel displays the messages to the customer/user to obey commands to perform the transactions. Usually function key or buttons are kept close to the display panel or Touch screen for performing various commands for the transactions. Output device of Record Printer helps in providing the user/customer a record transaction carried on the machine. The device of Vault has function to store the parts of the machinery and has very restricted access. The Housing of Automated teller machine is meant for aesthetics as well as to attach signage to. Other essential requirement for the Automated teller machines is power supply to machine and sufficient power back up by power storage battery for use during power cut/failure and internet connectivity [9].

There are two types of Automated teller machines are card based and card less. A card based Automated teller machine are equipped with a card reader to read a card (token), Keypad, an area for deposits has to be received, a money dispenser to dispense the money, printer for issuing receipts of transactions, and processor. A card-less Automated teller machine has to confirm identity on biometric parameters so has as its essential component a device which is capable to receive biometric information of the user/customer along with such input devices which are capable of storing information database of customer apart from processor, money dispenser, printers etc.
Figure 1.4: ATMs’ external block diagram

Figure 1.5 exploded view of an ATM
The partially exploded view of the RFTF Automated teller machine at Figure 1.5, illustrates door member 10b as being hinged on its left edge. However, to provide a door member 10b is an aspect of the present invention. Door can be hinged on either the left or right side of box portion 10a. Box portion 10a is, for example, a five-walled, open-box. The box is made up of any material suitable for making secure safe box type applications, such as steel. Other considerations are also taken such as fire-resistance may affect selection of the material for making box portion 10a. Box portion 10a may be provided with thermal insulation in a conventional manner to enhance re-resistance. Door member 10b has been swing-mounted on box portion 10a, via a hinge plate 29, to hinge points 16 and thereby located on an interior wall of box portion 10a, and 18, located on door member 10b. The door member 10b can be mounted on the other side of box portion 10a i.e. the right side, as seen in Figure 1.3. Hinge points corresponding to hinge points 16 can be provided on the opposing interior Wall of box portion 10a (not shown here). In this case, hinge plate 29 has been reversed, to use the other hinge points on the interior of the box portion 10a and also hinge points 18. Door member 10b can therefore be hinged along its right edge instead of the left-side orientation shown in Figure 1.5. It is one of preferred feature of the present invention to provide hinge points on both sides of box portion 10a, so that to permit the mounting orientation of door member 10b to be changed. Door member 10b can be locked closed by a conventional locking mechanism (not shown), such as a key operated sliding bolt, a code-actuated lock/digital lock or a combination locks, etc. One side of box portion 10a is provided with a conventional, front-loaded cash dispensing machine 20. Cash dispensing machine 20, in Figure 1.5, is characteristically loaded (i.e., replenished) from the same side from which cash is dispensed. It has a cash dispensing output 22 which has also been aligned with a slot opening 24 provided with the door member 10b. A customer receives the dispensed cash from Automated teller machine through slot opening 24. The other side of box portion 10a is provided with a deposit envelope intake bin 26. Envelope intake bin 26 may be a simple bin having selective opening slot through which a deposit envelope is inserted. Another example of an intake bin 26 according to the new invention is provided with motorized rollers for positively pulling a deposit envelope from the customer’s hand into the bin. In general practice, intake bin 26 has an intake portion 28 which is aligned with a slot opening 30 provided in door member 10a. The example of the present invention has been illustrated in Figure 1.5, intake bin 26 is accessed through the same side as intake portion
28. This is in keeping with the RFTF configuration of the Automated teller machine shown in Figure 1.5.

1.7 ATMs’ UNITS FUNCTIONS:

CRAD READER:
Card reader is a device to identify account number of the instant user. Card reader collects information from the magnetic stripe, which is on the back of the ATM card. For passing information to Card reader either the card has to be swiped or pressed or inserted as is the command of Automated teller machine. Once the card reader captures information from the card it conveys the details to the host processor. Information derived by card reader is for the use of the host processor, which gets connected to the card holder’s bank.

KEYPAD:
Keypad is used for various inputs like PIN (Personal Identification Number) which is confidentially allocated to for each card issued by bank to customers. Bank advises its customers for securities reasons one must change the PIN on regular intervals to have secured and confidential transactions and to mention various actions to perform on machine. Once the card reader recognizes the authenticity of the card, the machine asks for personal identification number and thereafter machine allows the client to perform further actions like withdrawal, balance enquiry, etc.

DISPLAY SCREEN:
Different operations instructions are displayed for view on screen of Automated teller machines for the user convenience and cross checking of values entered upon. All transaction information and the input entered by the user are displayed on the display screen except PIN to examine correctness of inputs entered. For PIN or pass word characters are hidden with display of * on the display screen. Each step of functions performed for transactions are shown by the display screen.
RECEIPT PRINTER:

Automated teller machine issues a receipt through its printer containing the details of the withdrawal, the date and time of transactions made, the amount withdrawn by the last transactions and also the balance of amount account after the transactions had been made. Thus receipt gives full and authentic information of the current transaction. Certain Automated teller machine gives options to the user to opt for taking receipt or not.

CASH DISPENSER:

This is the central system of the Automated teller machine. This is from where the user of Automated teller machines receives money for which he had used the Automated teller machines.

BIOMETRIC DEVICE:

In Automated teller machines working on card-less uses biometric device for identification of the client are used. Biometric information received from the customer like finger print, iris, vain recognition and other impression are matched with stored data on biometric available with bank. A biometric device Automated teller machines does not slot for inserting card and the card reader.

CASH COLLECTION DEVICE:

This is system of machine for collecting cash. A tray opens out from Automated teller machine wherein sealed envelopes are placed, while some of Automated teller machines receives cash directly and can recognize and differentiate with notes of different denominations

INFORMATION STORAGE DEVICE:

The device is used for storing the database of customer, including biometric information, which has been taken by the biometric device for comparison with standard data.

PROCESSOR:

Processor is the heart of machine which receives the input signals entered by the user from the input device of card reader or in card-less system wherein biometric information entered through the biometric device. The Processor after having access the database of customer information
in response to the input signals obtains data about the customer identified by the customer identifier, biometric information for the customer. The processor compares the received input data (PIN) from card or biometric details obtained from attached biometric system with data of the bank, and sends signal message to the banking network provider about confirmation of the customer’s identity when the received input data (PIN)/biometric information matches the stored biometric information of the bank. In case input data (PIN)/biometric information received from Automated teller does not match, Automated teller machine does not allow the user to proceed any further. Further in case of card reader device(s) the user is allowed another chance to proceed afresh, but entries of incorrect number thrice in to input device locks the card for further use till necessary protocols are corrected by the bank on the said card[10][11].

**Internal Block Diagram of an ATM:**

![ATM Internal Block Diagram](image-url)

*Figure 1.6: ATMs’ internal block diagram*
Introduction

The internal structure of an Automated teller machine is shown in figure 1.6. In this diagram there is a central processor which is connected with various input and output units. These are Display unit, function keys, Card reader, encrypted PIN pad, Printer, Memory device, crypto processor and a modem. These devices are connected with bus. When a transaction is made, the details are inputted by the card holder/user by biometric device installed in Automated teller machine. This information is passed on to the central processor. The central processor checks these details with the authorized bank. If the details entered are found to be correct, the machine delivers requested cash through the cash holder, amount is transferred by electronic fund transfer (ECS) from the customer bank account to the account of host processor. After transactions have been carried out, the processor sends approval code to the Automated teller machine for transfer of the amount to cash dispenser.

Automated teller machine connects directly the user and the bank. Automated teller machine achieves the connectivity through Controller via either internet lines or ADSL alternatively or dial-up mode mover of telephone line or directly through a leased line. For efficient performances leased lines are preferred above the plain or old telephone service lines (POTS) as lease line take comparatively less time to get the connection established. An Automated teller machine established in less-trafficked area or where machine have restricted use may be allowed to work on a dial-up modem or on the POTS line rather than leased line. Leased line are usually more expensive so operation on it is comparatively higher to operating cost than that of POTS line but where number of transaction carried is middle to high order preference goes to leased line, which seems to cheaper based on volume of transaction made otherwise not possible on POTS line. This problem can also be taken care of by providing high-speed Internet VPN connections which are more ubiquitous. Communication protocols of common lower-level layer is also used by Automated teller machines to communicate back to the bank. The system used for communications are SNAover SDLC, TC500 over Async, X.25, and TCP/IP over Ethernet. Additional methods are also employed to have transaction with security and secrecy. The communications between Automated teller machine and Transaction Processor takes place in encrypted code and one of such method is known as SSL.
1.8 DEFINITION OF ATM:

Automated Teller Machine can be terms as a computerized machine built to provide its user normally the clients of banks with facility to have access over their bank account for withdrawing cash known as dispensing cash by Automated teller machine as well to accept from the bank customers deposit in shape of currency notes or checks and allow the customer to transfer money from his or her account to materialize the deals and to carry out all these banking functions only though the machine thereby allowing the customer to carry transactions without visiting bank branch in person. Since Automated teller machines are available for operation any time of the day without any restrictions, it is also called 24-hour machines, thus Automated tellers machines are the electronic terminals allowing the customer of a bank to perform his banking operation at almost any time. Automated teller machine works as a full-fledged branch of the bank. Automated teller machine enables a customer to perform basic banking activities from locations far off from the actual bank and being aligned to number of banks it acts branch outlet for all the connected banks from one location. Automated teller machines are electronic machines to be operated by a customer himself to deposit or to withdraw cash from bank. Automated teller machine are not cumbersome in operation but are easily put into operation and does not any expertise or training for its users. For using an Automated teller machine, it is essential for customer to obtain an ATM card from his bank in advance. The ATM card are basically plastic card with magnetic stripes containing coded information. Cards are easily read by the machine. A bank customer in order to operate an Automated teller machine has either to insert or swipe the bank card into the Automated teller machine card reader slot for the purpose. Automated teller machine card reader finds out whether it has stored bank data related to the card and if the information matches i.e. confirmation is obtained and Automated teller machine has direct access to encoded information on the magnetic stripe of the card. Once the Automated teller machine has details of account of the user. The machine demands from the user to enter his or her personal identification number (PIN). Automated teller machine with biometric device performs in similar fashion to card reader machines except the user has feed his or her biometric details to the attachments of Automated teller machine and the machines receives the biometric data of the user for comparisons with the stored data with bank or input data obtained by Automated teller machine has to match to that stored data of the client. If the
authentication or password (number) is matches, then only Automated teller machine permits the customer to go ahead for the transactions be it withdrawal or for deposit. Once the transactions have been completed, Automated teller machine wherein card has been inserted ejects from the Automated teller machine. Automated teller machine devices act more as multimedia self-service kiosks running on converged Internet protocol networks. Automated teller machine works in similar fashion of cash withdrawing, when the clients use it for other purposes like mini-statement i.e. statement of certain number of past transactions, balance available in the account or allows change of PIN etc.

In simple words, Automated teller machine is device for its used by bank customers to process account transactions. An user initiates operations by inserting a card into the Automated teller machine an ATM card. TM card is card encoded with information on a magnetic strip. The strip contains an identification code which card reader of machine decodes and transmits to the bank’s central computer system through modem. To prevent unauthorized transactions, a personal identification number (PIN) user has also to enter by using a keypad. The computer after matching the pass word/PIN permits the ATM to complete the transaction. Most of teller machines can dispense cash, accept deposits, transfer funds, and provide information on account balances. Banks have joined hands together both nationwide and international networks facilitating customer of one bank can use an Automated teller machine of another bank without any hesitations. Therefore, Automated teller machine has become a computerized banking terminal providing cash dispensing and deposit acceptance and other banking transactions. Automated teller machine terminals have become very popular in all parts of the World and provide individuals with 24-hour electronic access to their banking accounts without human teller of bank.

In simple words, Automated teller machine is a Computer-controlled terminal located anywhere or elsewhere, though which bank customers have access over the bank for making deposits, withdrawals or other transactions as they would have done through a human bank teller. Other terms are sometimes used to describe and define such terminals such as customer-bank communications terminal (CBCT) and remote service unit (RSU). Now a day concept of Automated teller machine for use of single bank customer has become a thing of past. The Automated teller machine are shared by host of banks all together, though Automated teller
machine displays the sign of particular bank to which an Automated teller machine or number of Automated teller machine to which bank it belongs.

1.9 PROCESS OF ATM: CONTEXT LEVEL DFD:

The context level DFD is a data flow diagram giving the highest level and containing process for representing the entire system. The diagram of DFD displayed below represent the major data flow to and from the a machine..

![Figure 1.7: Context level DFD of ATM](image)

Generally, working process or data flow of an Automated teller machine is classified into following three categories/steps:
1.10 ACTIVATION OF ATM:

An automated teller machine after erection and commissioning and testing by the bank is left in stand-by mode for use by the clients. User activates the Automated teller machine by inserting the ATM card. There are three heads, namely, a magnetic stripe card reader, two Three tracks, one of them, read-only for the two heads, three heads can read and write), the second track a number of information stored by the second track to obtain the magnetic signal, after amplification, the decoder card number to obtain information the general reader read the card the data which is on a magnetic strip on the back of the card includes the bank’s routing number, the user’s bank account and their password. Once the card is entered, the machine reads the information from the magnetic strip and prompts the user to enter their password or “PIN” (personal identification number). If the PIN entered matches the PIN stored on the card, then user gains access to the Automated teller machines’ other functions.

1.11 COMMUNICATION OF DATA IN SYSTEM:

Card reader reads the information from the magnetic strip of the card using the bank’s routing number. After reading the information Automated teller machine connects itself to the main host computer of the bank which had issued the card and thus communication channel is established. After getting connected to banks host computer, the Automated teller machine becomes ready for use by the user, who can perform various banking operations on the machine. For example, whether the user wants to withdraw money or the user desires some the amount has to be sent to the other bank. Communications confirms if requisite amount is available in the account and the amount is withdrawing limit. If the account from the amount requested has sufficient balance for withdrawal intended, the withdrawal is approved, and the bank deducts the amount from the account. If the available balance in the account is insufficient, the withdrawal is denied. There are limits of withdrawal on ATM card for each withdrawal as well as limits of withdrawal in a day. Automated teller machine denies the withdrawal of amount of the amount indented is above the limit of single transaction or above total transaction for the day. For safe and secure data transmission in the network data communicated is transferred in encrypted form. To secure transmission of confidential information like PIN, password etc; the clients have to keep these information personal, private and confidential for himself/herself. In the network there are so many methods are used for encryption of information.
DISPENSING MONEY:

Once the Automated teller machine receives approval from central computer oh host bank, the machine is able to dispense the specified amount of money through dispenser slot in the machine. The money to be dispensed is held in a sealed container with a spring-loaded bottom to maintain pressure. Rubber wheels are in contact with the top of bill(s) roll, the money gets dispensed into a holding area until the correct amount is reached. Once the correct amount is counted out, the bills exit via the external slot to the user. The Automated teller machine asks the user whether he/she wants print out of transaction, if conveyed yes by the Key pad, Automated teller machine activates printer, prints the information and delivers to the user through designated slot. Some of Automated teller machine automatically delivers prints out to the user. Automated teller machine then returns the card (where card has been inserted) and returns to standby mode.

CASH COLLECTION

Details of deposit are to be by the user on the envelope to be used for depositing. Automated teller machine is to activated in the same ways for withdrawing the cash and identification of user(ATM card) and PIN, the machines asks for account number in which deposit is to be made and if the users needs an envelope. Users are required to use only authorized envelopes which are self glued for sealing. There is restrictions of number of bank notes to be deposited in a single envelop, so that Automated teller machine can sallow the envelope. Sealed envelopes are placed at tray which opens on command by Key board and by operation of Key command Automated teller machine is asked to sallow the deposit. Once the tray for receiving cash (envelope is closed) the machine performs in the manner similar to cash withdrawal and comes in to standing mode.

Step by step data processing of machine for cash dispensing are described by which we can easily understand the step by step data process functioning of Automated teller machine and its operation these steps are as follows:

Step 1: Enter PIN and verify PIN
Step 2: prepare command for processing
Step 3: update display
Step 4: display customer options
Step 5: prepare message
Step 6: receive operator commands
Step 7: manage withdrawal
Step 8: prepare printout
Step 9: complete transaction and return to standby mode

Step by step process flow diagram of an ATM:

Figure 1.8 Process flow diagram of ATM
1.12 TYPES OF ATM

There are five types of Automated teller machine these are:

**Onsite ATM**-
Automated teller machine is located either within the branch premises or in very close proximity of the branch.

**Offsite ATM**-
Automated teller machine is not located within the branch premises but is located at other places, such as shopping centers, airports, railways station and petrol stations.

**Worksite ATM**-
Automated teller machine is located within the premises of an organization and is generally meant only for the employees of the organization.

**Cash Dispenser**-
Allows only cash withdrawals, balance enquiry and mini statement requests, cash dispenser (CD) is generally used as the Automated teller machine, however the customer cannot deposit cash or cheques in a CD, whereas full Automated teller machine is designed cash withdrawal as well as for depositing cash or cheque.

**Mobile ATM**-
It refers to an Automated teller machine, which are installed on commercial vehicle that moves in various areas for the customers. Such Automated teller machine is also known ATM on wheels and have been introduced by Few private banks.

**Objectives of ATM**

The objective of Automated teller machine is that people can draw or save money at any time by themselves and reduce staff’s work. The best use of user is not bound to perform transaction with a bank during banking hour of the day and only working day of bank. Automated teller machine also to reduce labor costs for the bank and increase availability of banking service in
a safe and cost effective method. An ATM system enables the customers to have easier
transaction of money at anytime without standing or waiting in queue. Followings are the main
objectives of Automated Teller Machine or an ATM as it is commonly called is a machine that
provides banking functions to customers. It is needed because:

Banks are open for particular hour on working day.

Not all bank branches are open on all days of the week.

Customers may need banking functions even on holidays and weekends.

Customers may not be in a position to visit the bank every time they want to withdraw or
deposit money.

So, the Automated teller machines help banks to provide banking services to their customers
24x7 on all 365 days of the year.

1.13 ADVANTAGES & DISADVANTAGES OF ATM

ADVANTAGES OF ATM

Followings are the main advantages of ATM:

1. ATM provides 24 hours service: ATMs provide service round the clock. The customer
can withdraw cash up to a certain a limit during any time of the day or night.

2. ATM gives convenience to bank’s customers: ATMs provide convenience to the
customers. Now-a-days, ATMs are located at convenient places, such as at the air
ports, railway stations, etc. and not necessarily at the Bank’s premises. It is to be
noted that ATMs are installed off-site (away from bank premises) as well as on site
(installed within bank’s premises). ATMs provide mobility in banking services for
withdrawal.

3. ATM is cost beneficial: An executive/business man/any individual who has to travel
can withdraw cash out station without any additional cost, where he/she is required to
pay commission to bank for issue of travelers cheque and has to return unused travelers
cheques as they have validity period with them and uses losses interest on traveler
from date of issue to date of use/refund.
4. ATM reduces the workload of bank’s staff: ATMs reduce the work pressure on bank’s staff and avoids queues in bank premises.

5. ATM provides service without any error: ATMs provide service without error. The customer can obtain exact amount. There is no human error as far as ATMs are concerned.

6. ATM is very beneficial for travelers: ATMs are of great help to travelers. They need not carry large amount of cash with them. They can withdraw cash from any city or state, across the country and even from outside the country with the help of ATM.

7. ATM may give customers new currency notes: The customer also gets brand new currency notes from ATMs. In other words, customers do not get soiled notes from ATMs.

8. ATM provides privacy in banking transactions: Most of all, ATMs provide privacy in banking transactions of the customer.

DISADVANTAGES OF ATM

Following are the main disadvantages of ATM:

People with disabilities experience a range of difficulties while attempting to interact with Automatic teller machines. Level and quantum of difficulties may vary depending upon the nature of the disability, but the overall outcome is lack of comfortable and effective use of ATM facilities. This may lead to over-the-counter surcharges or even denial of access to funds.

Though there are talking ATMs for visually impaired but they very few and visually impaired can either make use general ATMs with help of assistance, which is not without added risk or cannot use general ATMs as he cannot make read directions on the screen and some or cannot use all of the keyboard functions.

In brief, for people with low vision, the problem is the difficulty encountered reading the ATM signage, screen, key labels and receipts. Glare, poor lighting and the all-to-often small and low contrast print combine to make access difficult. Newer ATMs with larger clearer screens are preferred by people with some residual vision.
Although keyboards are an important part of an ATM, from an accessibility perspective they really are secondary to the screen output of the machine. Many ATMs in Australia now have some Braille on the keypad keys which is of assistance to a number of people who are blind. However, Braille on keys is neither not nearly as important nor of nearly as much benefit as the general public and even most banking staff have been led to believe.

Glare, and the size and contrast of print on ATM screens are the main problems that people with low vision face when conducting an ATM transaction. Lack of contrast and poor definition labeling on the machine and difficult to read receipts are also a barrier.

Most people surveyed didn’t conduct advanced ATM transactions, as is probably the case for the majority of ATM users. Cash withdrawal was the main function carried out via ATM, with telephone banking and branches being used for more demanding requirements.

Transactions on ATMs over and above permissible limit is at cost and the Reserve bank of India has further restricted free use of ATMs of other bank.