# Cash Withdrawal From ATM Machine Using Mobile Banking

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*Abstract-Aim of this research paper is to propose an enhanced feature to improve the service of ATM cash withdrawal in less time with more level of security. This research is to combine the ATM & Mobile banking to reduce the time of withdrawal money from ATM with increasing level of security by adding a new feature in the Mobile banking. There is no change required to the existing system but some addition required, which makes no impact on existing system. This research, which will increase the speed of cash withdrawal almost 3 times fast; customers have positive impact, if proper functioning is ensured by the banks. The research can be used by banks to improve the services of ATM and can increase the overall satisfaction of their customers & save cost for new ATMs.*

*Keywords*-ATM, Mobile banking, O.T.P (One Time Password)

## I. INTRODUCTION

Few years back, to withdraw the money, we have to visit banks, waiting for our turn in long queue, fill form to give particulars; only then we get the cash. It was like a big project to withdrawal cash from Bank account and we have spend large time. After some time, technology move forward and some great minds invented a vending machine called ATM machine [1], which gives cash from particular account using a smart card [2], [3]. Then banks started to install ATM machines, which gives you cash from your account within few minutes without filling any form. You can even find ATM machine everywhere. But still sometimes, you have to wait in the queue of ATM machine.

Consumers are mostly using debit and credit cards ratherthan cash to pay for shopping, resulting in few cash withdrawal from the ATM [4]. But still there is need of cash at some places, for that consumer have to visit ATM machine to get it from his account. Nowadays, more than 1.5 million ATM machines are installed worldwide. In 2014, about 34000 ATM machines are installed only in India. But because of increasing users, still sometimes, we have to wait in a queue in front of the ATM machine. Sometimes, we are in hurry, but to withdrawal the cash, we have to wait in the queue of ATM machine doing nothing. Not only this, we have to select lot of unwanted options like language, account type, print

transaction etc. to withdrawal the cash on ATM, which consumes time. Can't we do something to save our time to withdrawal the cash by doing the transaction, while standing in the waiting queue or on the way to ATM machine? Yes we can, by using this new emerging feature "Cash withdrawal using Mobile banking."

Mobile banking using particular bank App is now more famous & growing faster. The main reason behind this growth is customer convenience and lower operational cost for banks and other financial institutions. According to analyst, costing of transaction using mobile phone is about 10 times less than ATM and about 50 times less, if physical bank branch used.

The ATM users access their account through special type of plastic card e.g. master, visa, verve card etc. The card is encoded with user information on a magnetic strip. The magnetic strip contains an identification code that is transmitted to the bank's central computer by modem. It was developed as a result of need for self-service technology (SST) in financial service delivery by financial institutions

The moto of ATM machine designed to replace the manual banking transactions in which customers walk into the bank to fill tellers, withdrawal booklets or cheque. The manual banking system are based on paper, it is time consuming and lacks efficiency in record keeping then giving room for manipulations. In recent time ATM has served as a device that enhances the cashless policy due to its functionality in fund transfer between one account and other.

Apart from using ATM's other computer-based/IT based banking technologies are available for examples internet banking and mobile banking, but the demand for cash still remains high and bank branches are rising continually worldwide as customers demand cash to be accessible at different locations.

ATM allows you to do a number of banking operations such as withdrawing cash from one's account, making balance inquiries and transferring money from one account to another using a plastic, magnetic-strip card and personal identification number issued by the financial institutionCurrently one and major way to get access toyour

account in other to perform some of the transaction mentioned earlier is through the use of ATM card. There are lot of problem associated with the uses of ATM card, these include: Lost or Stolen Card, use of ATM card by third party to perform transaction, ATM Card Skimming & PIN Capturing, damaging of ATM, card expiring, charges on issuance of the ATM card and maintenance by financial institutions etc. with all the problem mentioned, the use of ATM card has become a treat to safety of customer funds, even though the stakeholders in financial transaction are making great efforts to reduce ATM frauds.

The entire problem associated with the use of ATM card can be eliminated if we can have card less ATM. The objective of this study is to design a card less ATM machine that uses alphanumerical PIN, and bio-metric access control system. This machine will group the activities to be perform on ATM into two, a group of function can be performed by the uses of alphanumerical PIN only, while other can be performed through the use of bio-metric access control system.

## II. PROPOSAL

As we can see, cash withdrawal has evolved with Bank erato ATM era as well as other services like balance check, fund transfer evolved from physical banks to e-banking and from e- banking to Mobile-banking [5],[6]. Purpose of all these transformation is to save customer time, to increase the accuracy and to make system more secure. In this fast running world, banks have been left with no option but to adopt the technological changes to satisfy their customer's requirements. In this upcoming feature, the main purpose is to utilise the waiting time of customers in ATM queue, so that the actual ATM cash withdrawal time can be minimised as well as save cost to install new ATM's for financial institutions. Like other features – balance check, fund transfer, transaction check in Mobile banking [7], a new feature of cash withdrawal will be added in the list of options. Customers, who wants to withdrawal the cash, will login in their Mobile banking and do a cash withdrawal transaction just like on ATM machine using "Cash withdrawal" feature. When the process of cash withdrawal is completed on Mobile, transaction is not completed actually and there is no change in account balance; because customer did not get any cash yet.

For security reason, a new password (O.T.P) is provided tocomplete the transaction on ATM machine. A new table will be created on Bank server, which will maintain all cash withdrawal transaction created using Mobile banking. Records of transaction in this new table is temporary, which will remain for a particular fixed time period or till it's

actually completed; whichever comes earlier. There will be unique entry for each account, because system is not permitting more than one pending transaction for a single account.

To get the cash, after completed the process on the Mobile, bank ATM card is required for corresponding account as a hardware security. Now, there is no need to go through all the steps at ATM machine to withdrawal the cash like normal cash withdrawal. System will check the table, which maintains the cash withdrawal transaction created using Mobile banking. If a transaction corresponding to particular account is in table, then system retrieves the transaction and just a password gives the cash and print transaction receipt, if selected. But in case, there is no transaction pending in the table, then system will continue with existing normal ATM machine operation.

Using ATM Mobile Banking application we can withdraw money without ATM card as well as we can withdraw money from any ATM machine. So this will reduce the time required to withdraw money from ATM machine, user can just complete transaction using mobile application and he will withdraw money from ATM machine using recently placed transaction, this approach reduce the time required to withdraw money from ATM machine. Using mobile Banking app user can place many operation's like inter-bank fund transfer also other bank fund transfer, last transaction history, passbook etc

## III. CHANGES REQUIRED

### A. Mobile Banking Application [5],[6]

As we all know, Mobile banking is anywhere anytime banking. So, to save the time of customers on the ATM machine, a new feature named "Cash Withdrawal" will be added in the Mobile banking application just like balance check, fund transfer, transactions check etc. This feature will follow the sequence of corresponding bank ATM machine cash withdrawal steps and generate a transaction record, which will store on the server for the corresponding account with current time stamp. For authentication, One Time Password (O.T.P) will be sent to the registered Mobile number, which will be used to complete the transaction on ATM machine. This feature does not create any disturbance to the existing features of Mobile banking. All will remain same with current working functionality.

### B. ATM machine Application

To get the cash from ATM machine using this feature, smart card is required as usual. When smart card is

inserted in the ATM machine, account information for the corresponding card is retrieved from server. After enabling this new feature, ATM machine application will check the account information as well as pending transaction information from server. If there is any pending transaction i.e. transaction done by Mobile, then system will show the screen to enter O.T.P (which was sent on registered mobile number for corresponding account) to complete the transaction along with option to cancel the pending transaction and start new one. On entering the valid O.T.P (if it does not timeout), cash will come out and transaction will be completed. Whereas on selecting the new transaction option, normal ATM process will be followed. In case, there is no pending transaction for the account, existing ATM application will run without giving the prompt for O.T.P. That means there is no change for ATM users, who will not use "cash withdrawal" feature from Mobile banking.

**C. Banking Server[6]**

This will required new table on to the server without change or distributing the existing one. This table will store only required fields related to a cash withdrawal transaction done by Mobile banking. The size of the table is limited, as there is only one transaction of cash withdrawal can be exist per account, which is done by Mobile banking i.e. Maximum size will be number of accounts in a bank and minimum is 0. As well as the pending transaction remains in the table, till it is not completed/cancelled by using ATM machine or expired after a defined time. Expired time will be configurable. For the time 15 minutes looks optimal time period for expiration of pending transaction and O.T.P sent on registered mobile.

## IV. TABLE FORMAT

In this new table, only the important fields are to be stored, mentioned in Table 1, which are used in a transaction. Below is the detail of table

TABLE 1. PENDING TRANSACTION

| Account number | VARCHAR(15) NOT NULL PRIMARY KEY |
| --- | --- |
| Amount | INT    NOT NULL |
| Print | BOOLEAN (Default 0) NOT NULL |
| OTP | VARCHAR(6) NOT NULL |
| Created | TIMESTAMP   NOT NULL |

A. Account Number

Primary key of the table is account number. Because we are allowing only one cash withdrawal transaction from Mobile banking for any account, so there is no possibility of same account number in two records. As well as this field cannot be null, because a transaction cannot be possible without an account number.

B. Amount

To withdrawal the cash, amount needs to be entered using Mobile banking. This information needs to be stored to complete the transaction from ATM machine. This field cannot be null and should be greater than 0. All other constraints like multiple of 100, cash withdrawal limit etc. during cash withdrawal on ATM machine are also applied in this feature.

C.Print Receipt

This is a Boolean option, whether a print receipt of transaction is required or not. By default value is 0. On selecting the Yes option for print receipt, 1 will be stored.

D. O.T.P [8]

When the process of "cash withdrawal" is completed in Mobile banking, a 6 digits O.T.P is generated and sent to the registered Mobile number, which will be used to complete the transaction on ATM machine. The necessity to store the O.T.P is to match with the O.T.P entered by user during the completion of transaction on ATM machine.

E. Created

This field is used to store the time stamp of the incomplete transaction, when it is created. This field is periodically compared with current time to check if the transaction is expired or not. There is defined time to keep the transaction in pending state. If it is not completed or cancelled by user using ATM machine, it will delete automatically after defined time.

## V. SECURITY [9]

Security is the main concern, when there is dealing with banks. Individual mobile needs to be register with bank account to use the banking service, which increase the security. There are further stronger authentication in smart phones like camera for face recognition, mic for voice recognition, fingerprint reader and Geo-location to use. All these security could be added without disturbing user experience. So with the help of all these feature Mobile banking can provide better security as well as better user convenience than traditional online banking. This upcoming

feature will upgrade the security to the next level with same user experience. Below are securities with this new feature.

## A. Mobile Banking PIN

This password is required to start the Mobile banking application, before starting the process of cash withdrawal. This security already exists in current system.

## B. ATM PIN

This password is already required to do the transaction on ATM machine. Correct ATM password is still required when "cash withdrawal" option is selected from Mobile banking to proceed with other options.

## C. ATM PIN Attempt

It is same as on ATM machine, there is limit of wrong ATM PIN attempts. If wrong attempts exceed the limit, ATM card will get blocked, which can be unlocked by contact bank.

## D. O.T.P [8]

When we normally withdrawal the cash from ATM machine, ATM PIN is used to login. We have to take extra care from others, while entering the PIN. Whereas using "cash withdrawal" feature of Mobile banking, O.T.P is required to complete the transaction or to get the cash from ATM, which is a random number for every transaction. So, do not worry while entering O.T.P in front of others. Ascot (An Authentication Company) recommended O.T.P for user authentication to combat man-in the middle attacks.

## E. Mobile Registration

O.T.P, which will be used on ATM machine to complete the process of "cash withdrawal" done by Mobile banking, will send only on registered Mobile number. Mobile number registration is must to use this feature.

## F. Transaction expiry

Transaction of "cash withdrawal" using Mobile banking, store in a table with time-stamp of transaction done. There is defined time to complete or cancel the transaction from ATM machine; otherwise the transaction will get deleted as soon as the defined time is expired.

## G. O.T.P Attempt

It is same as ATM PIN, there is limit of wrong O.T.P attempts as well. If wrong attempts exceed the limit, ATM card will get blocked, which can be unlocked by contact bank.

## H. Transaction limit

There is only one "cash withdrawal" transaction is allowed using Mobile banking at any instance of time, which is stored on the server. Only after complete/cancelled/expiry of the transaction, another transaction is possible. Except all these software security features mentioned above, already existing other security features like cash withdrawal limit, number of transactions in a day, balance check, money in ATM machine etc. will also be remain available as it is corresponding to any particular bank.

## I.Hardware Security [2], [3]

Currently to withdrawal cash from ATM machine, customer requires ATM card of particular account, from which he wants to withdrawal cash. Similarly, to complete the transaction of "cash withdrawal" using Mobile banking, customer will require the ATM card of corresponding bank account on ATM machine to complete the transaction.

# VI. RELEVANT MATHEMATICS ASSOCIATED WITH THE PROJECT

Set Theory

1 Set Theory Analysis

a)Let S be the File Stored

$S= .$
Set S is divided into 3 main classes
$S= S1, S2, S3$
$S1=$ Bank server
$S2=$ ATM machine
$S3=$ Mobile banking app

b)Identify the inputs.
For S1
Inputs $= x1,x2$
$X1=$ Transaction
$X2=$ User data

c)Identify the output for S1.
Outputs $= Y1$
$Y1=$ Transaction completed successfully.

d)Identify the inputs.

For S2

Inputs = X3, X4, X5

X3= Registered mobile no.

X4= OTP

X5= Amount

e)Identify the output for S2.

Outputs = Y2,Y3

Y2= OTP

Y3= Cash

f)Identify the inputs.

For S3

Inputs = X6,X7,X8

X6= user login

x7= authentication

x8= transaction

g) Identify the output for S3.

Outputs = Y4

Y3= send transaction to bank server

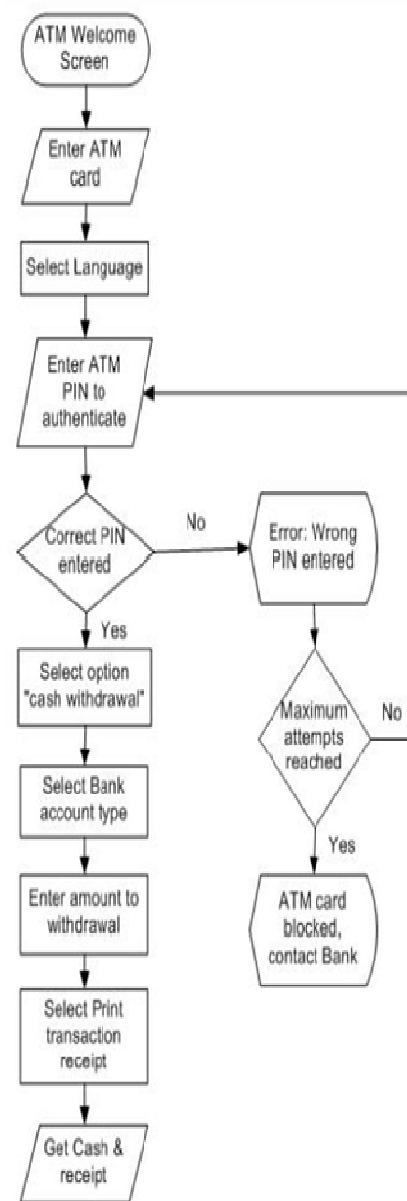## VII. EXISTING ATM CASH WITHDRAWAL SYSTEM (BASED ON ICICI ATM )



Fig. 1. Existing ATM Cash Withdrawal System
(Based on ICICI ATM )

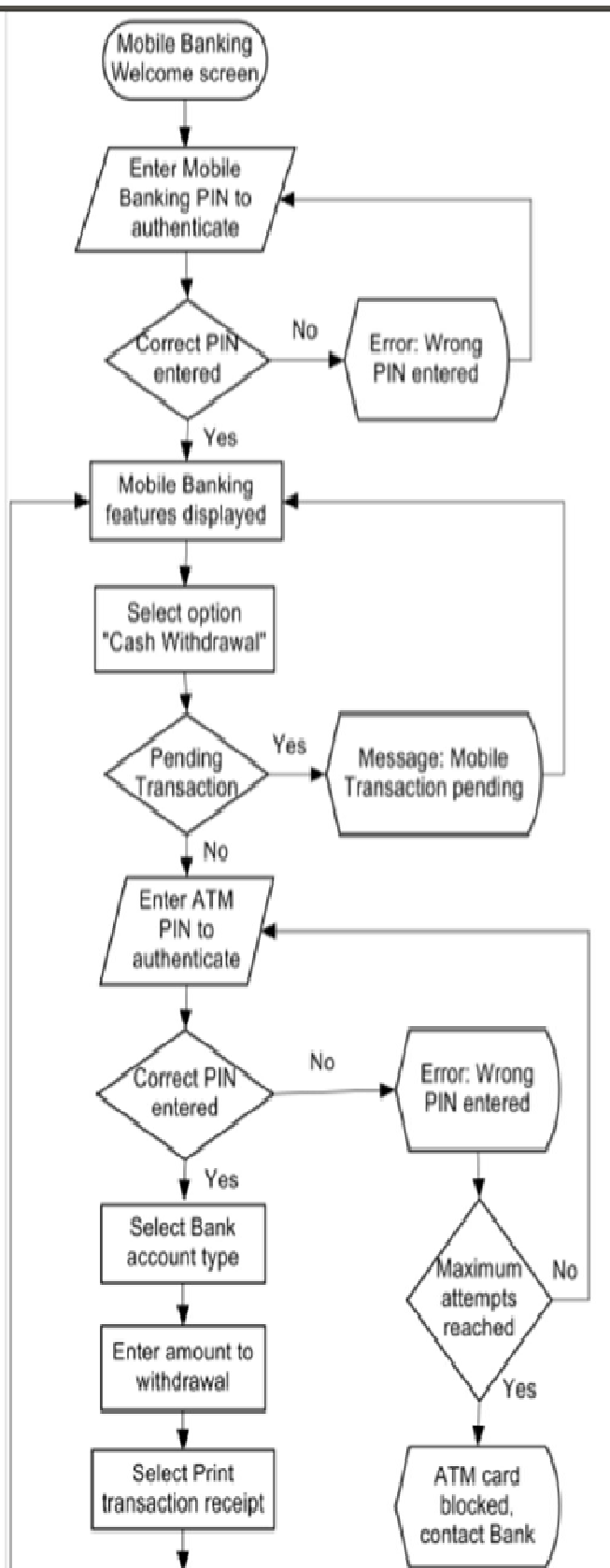## VIII. NEW MOBILE APPLICATION FLOW CHART (BASED ON ICICI MOBILE BANKING)

Fig. 2. New Mobile Application Flow chart (Based on ICICI Mobile banking)

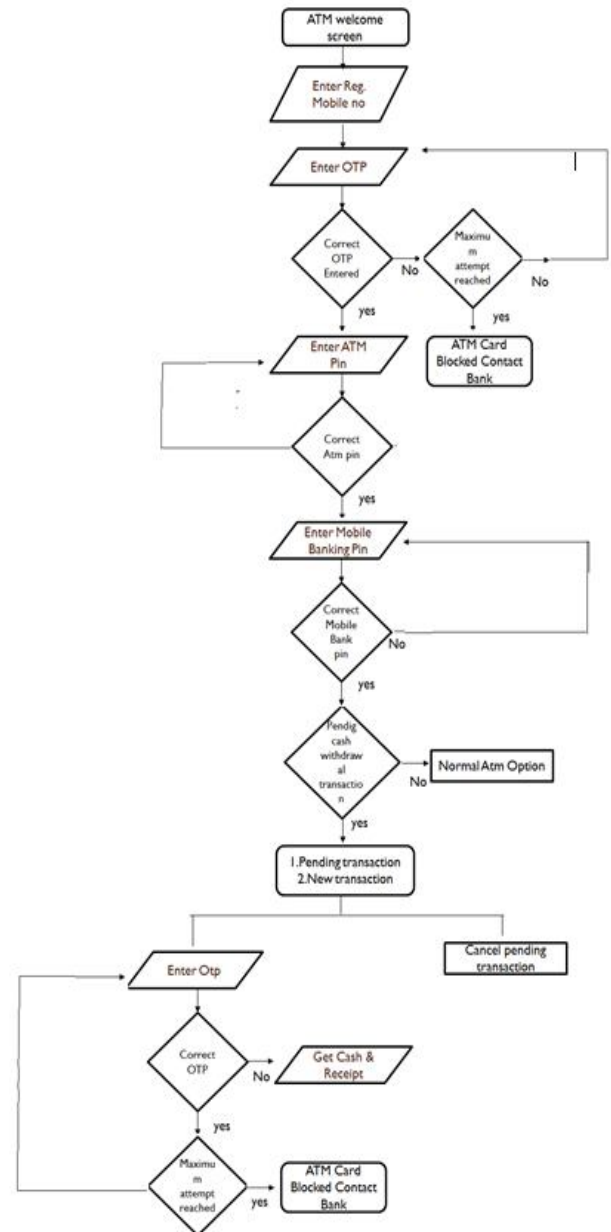## IX. NEW ATM CASH WITHDRAWAL SYSTEM



Fig. 3. New ATM Cash Withdrawal System

## X. REVIEW OF CONFERENCE / JOURNAL PAPERS SUP-PORTING THE PROJECT IDEA

### 1) 2012, "CUSTOMER PREFERENCE TOWARDS USE OF ATM SERVICES IN PUNE CITY"

A.T.M is one of the most popular delivery channel as it permits customers to do Anywhere, Anytime banking. Both, the bank and customers stand to gain in several ways. when A.T.M machines bring down the cost per transaction this will increase efficiency by reducing workload of staff, they help to increase accuracy, speed, save time, money and efforts of

customers. Thus, A.T.M impacts the customer services and leads to better customer satisfaction. To analyse the relationship between demographic variable and preference to use ATM, a structured questionnaireis used to collect the data from a convenience sample of 300 customers from three sample cooperative banks in Pune city. Frequency and Percentage analysis and chi square tests are applied for data analysis and interpretation. Also, chartsand tables are prepared for better understanding of the findings.

Objectives:

1) To study the problems faced by customers while using ATM services of- fered by select Cooperative banks in Pune city .
2) To study the awareness and preference to use ATM services offered by select Cooperative banks in Pune city.

2) 2008 , "Integrated OTP-based User Authentication Scheme Using Smart Cards in Home Networks" :

In this paper, we propose a new user authentication (UA) scheme based on one-time password (OTP) protocol using smart cards for home networks.

3) The proposed scheme is to au- thenticate home users who uses home devices. Several techniques using technology based on biometrics, passwords, certificates, and smart cards can be used for user authentication in the similar environments. However, such user authentication techniques mustbe examined before being employed in an environment where home devices have low efficiency and performance. The proposed authentication system is designed toaccept the existing home network based on the O.T.P protocol.

Also, it is a well suited solution and is quite satisfactory in terms of the security requirements of home networks, because of requiring low computation by performing simple operations using one-way hash functions. proposed system can protect against illegal access for home services and devices and does not allow unnecessary service access by legitimate users using aur authentication system.

Objectives:

1) The remote system does not need to keep the userID-password table to verify the user. However, such a weak-password authentication approach leads to heavy computational load on the entire system.
2) OTP protocol to use the password between home appliances (mobile devices) and authentication server

3) 2014 , "Assessment of Information Security Awareness among Online Banking Costumers in Nigeria "

Internet banking system has classically supplanted traditional banking system in both developed and developing nations due to rapidly growing Information Technology (IT) in today world. Internet banking which is also refer to as online banking has not only increase the productivity of banks but also give room for easy transactions by the customers. When people introduce to internet banking in country (Nigeria), the banking sector has experienced a tremedious change in its mode of operations. Meanwhile,Internet banking system has some challenges including information security. Information security challenge mostly affects online banking customers who supply their details during online transaction.For costumer not to be a victim of this information security challenge, there must be proper information security awareness. This information security awareness will serve as guide for online banking customers. Many costumers enter into banking hall to applyfor internet banking and start using such immediately on the approval of their banks. The question is ,do the customers aware of information security implication of the online banking? If yes, what is the level of their awareness? To address these questions, we carried out a survey that uses questionnaires to assess the level of awareness of online banking costumers on information security.The analysis of our survey revealed that online banking customers are not fully aware of the threats and risks associated with online banking which means that the level of information security awareness is low. This will show that the system is weak so we can improve the system.

Objectives:

1) Internet banking provides customers a big advantage of not having to goto the banking hall before carry out their transactions

4) 2012, "Mobile Banking as Technology Adoption and Challenge: A Case of Mobile Banking in India "

If technology comes in advanced, one of the notable sectors of the economy where technology is at it helm of affairs with respect to customer service is BANKING. Over the years, banking has transcended from a traditional brick-and mortar model of customers queuing for services in the banks to modern day banking where banks can be reached at any point for their services. In todays business, technology has been on the predominant indicators of growth and competitiveness. The banking industry today is in the industry of its revolution. Information technology has basically been used under two different avenues in banking. One is

communication and connectivity and other is business process. Today, banks have welcomed wireless and mobile technology into their boardroom to offer their customers the freedom to pay bills, planning payments while stuck in traffic jams, to receive updates on the various marketing efforts while present at a party to provide more personal and intimate relationships. This paper examines consumer adoption of a new electronic payment service as mobile banking and the factors influencing the adoption of mobile banking in India.

Objectives:

1) focus on the adoption of mobile banking services by consumers.
2) Identify factors influencing the adoption and usage of mobile banking in India.

## XI. C ONCLUSION

A. Time Saving

The main purpose of this research is to save customer time to withdrawal cash from ATM machine, by utilizing waiting time in the ATM queue. Normally a successful cash withdrawal transaction takes at least 30 seconds, more in case of wrong attempts; but using this feature, successful transaction will be done only in 10 seconds. That means transaction of cash withdrawal using this feature will take less than half time, so there is more than 50% time saving.

B. ATM PIN privacy

After using this feature, there is no need to hide ATM PIN on the ATM machine, because customer will not use it on ATM machine. Customer will use OTP to complete the transaction, which is random number for every transaction.

C. PIN length

ATM PIN is 4 digits long, whereas OTP can be 6 digits long.

D. Security enhancement

Using this feature, PIN security to withdrawal cash is increased. Other than ATM PIN, someone require Mobile banking PIN and OTP (which is sent on registered Mobile number only) to complete the transaction.

E. Availability of existing system

If the ATM machine is free, there is no waiting time; and then we can directly use existing cash withdrawal process. There is no change in system, who don't want to use this feature.

F. Cost saving for Banks

If ATMs will no more crowded, less need to install new ATM machines. Eventually, it will save cost to banks.

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