Efficient 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 functionality of ATM cash withdrawal in minimum time with increased 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 in 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 three times fast; could have positive impact on the customer's satisfaction, if proper functioning is ensured by the banks. This research can be used by banks to improve the functionality of ATM and can enhance the overall satisfaction of their customers & save cost for new ATMs.*

Key Words: ATM, Mobile banking, QR code, Cash withdrawal

1. INTRODUCTION

Few years back, to withdraw the cash, we have to visit banks, waiting for our turn in long queue, fill form to give particulars/bank worker; only then we get the cash. It was like a big project to withdrawal money from Bank account and we have to spend a lot of time. After some years, technology move forward and some great minds invented a vending machine called ATM machine, which gives cash from particular account using a smart card. Then banks started to install ATM machines, which gives you money 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 rather than cash to pay for shopping, resulting in few money withdrawal from the ATM . But still there is need of cash at some places, for that consumer have to visit nearest ATM machine to get it from his account. Nowadays, more than 1.5 million ATM machines are available 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 machines. 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 lots 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 some steps, while standing in the waiting queue or on the way to ATM machine? Yes

we can, by using this new emerging feature "Efficient 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 ten times less than ATM and about fifty times less, if physical bank branch used.

1.1 PROPOSAL

As we can see, cash withdrawal has evolved with Bank era to ATM era as well as other functionality like balance check, fund transfer evolved from physical banks to e-banking and from e-banking to Mobile-banking. 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 utilize the waiting time of customers in ATM queue, so that the actual ATM cash withdrawal time can be minimized as well as save cost to install new ATMs for financial institutions. Like other features – balance check, fund transfer, transaction check in Mobile banking, 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 QR-code is provided to complete 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.

2. CHANGES REQUIRED

A. Mobile Banking Application:

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, QR-code 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 QR-code (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 scanning QR-code (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 OTP. That means there is no change for ATM users, who will not use "cash withdrawal" feature from Mobile banking.

C. Bank Server:

This feature required a new table on the server without disturbing the existing ones. 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/canceled 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 QR-code is sent on registered mobile. 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 Geolocation 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

ATM PIN 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.QR-code

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, OTP 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 scanning QR-code in front of others. Vasco (An Authentication Company) recommended QR-code for user authentication to combat man-in the middle attacks.

E. Mobile Registration QR-code, 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 timestamp 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. 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/canceled/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.

3. CONCLUSIONS

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 QR-code to

C. Security enhancement

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

D. 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.

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