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Multi Bank ATM Family Card: INTEGRATION OF MULTI BANK MULTIPLE USER IN SINGLE CARD WITH USER BEHAVIOR MONITORING USING HMM & FORMULA VERIFICATION

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Abstract— The aim of this project is to use debit / credit card access for the purpose of customer's money transactions in case of lack of money in a particular account. The multibank smart card is an application software designed to take advantage of today's technology and reduce or avoid the time delay of amount transaction. This facilitates multi user to access his/her account with a single ATM card. User can create account and get the ATM card from the bank. He can integrate all his accounts in other banks in this single card with unique PIN number accordingly. User behavior is monitored through HMM Model and he can set up a formula based authentication. He can include all his family members accounts details also in the same card. He can withdraw cash from the account after successful authentication of the corresponding PIN number.

Index terms—debit/credit card, money transactions, application software, ATM card, PIN number

Introduction

Information technology (IT) not only introduces convenience, but creates many new improvements which were impossible in the past. For example, advances of business intelligence (BI) methods and data mining techniques have brought huge improvements to modern business operations[10]. Nowadays, in the "big data era," a massive amount of data is available for all kinds of industrial applications. For example, the cloud service can be considered as a data warehouse which provides a useful source of data. Wireless sensor networks [e.g., radio frequency identification (RFID), near field communications] can be used to collect useful data ubiquitously. An evolving topic on the Internet of things (IoTs), which consists of devices capable of communicating via the Internet environment, also provides a platform for gathering an enormous amount of data. In other words, it is now easier to collect data than ever before. It is said that, extracting and utilizing useful information from such huge and dynamic databases for "big data" is far from easy. Since these data are linked to real-time events, they can be employed for rescheduling or replanning activities in business applications which finally reduces the level of risk and improves profitability and efficiency of the operations. This undoubtedly can supplement traditional optimization techniques, which are *a priori* in nature. For instance, Zhang *et al.* considered a dynamic workload scheduling problem with the help of big data stored in distributed cloud services. They developed an evolutionary optimization algorithm and simulated the performance under different scenarios. In another study, Zhang *et al.* analyzed the cost minimization issue of moving data around geographically dispersed data. Such data migration problem is very important yet challenging as the volume of big data is growing quickly. Dou *et al.* Developed a service optimization model for handling big data stored in cloud systems when privacy is a critical concern (e.g., the medical data). Service quality may be compromised if a cloud server refuses to provide the data due to the privacy issue. Such optimization model can maximize the service quality and is verified by a simulation study. Another application of big data is on smart grids. Simmhan *et al.* predicted the demand of a cloud-based smart grid system and derived the optimal pricing strategy, based on the big data on real-time consumption. The approach is possible due to the data mining algorithm the authors developed. Owing to the importance of big data analytics for business applications, this paper is developed. With respect to the core topic on big data analytics for business operations and risk management, we organize this paper into three big sections, namely: 1) BI and data mining; 2) industrial systems reliability and security; and 3) business operational risk management (ORM). Each of these sections:

1) examines some carefully selected papers; 2) outlines the related research challenges; and 3) proposes the future research directions. To the best of our knowledge, this is the first paper in the literature which focuses on how big data analytics can be employed for reducing systems risk and enhancing efficiency in business operations.

Assistive Technologies

In this project HMM model is used for user behavior monitoring .This model is a statistical Markov model in which the system being modeled is assumed to be a Markov process with unobserved (*hidden*) states. An HMM can be presented as the simplest dynamic Bayesian network. In simpler Markov models (like a Markov chain), the state is directly visible to the observer, and therefore the state transition probabilities are the only parameters. In a *hidden* Markov model, the state is not directly visible, but the output, dependent on the state, is visible. Each state has a probability distribution over the possible output tokens. Therefore, the sequence of tokens generated by an HMM gives some information about the sequence of states. The adjective 'hidden' refers to the state sequence through which the model passes, not to the parameters of the model; the model is still referred to as a 'hidden' Markov model even if these parameters are known exactly.

RFID smart card is used as an ATM card. Radio-frequency identification (*RFID*) uses electromagnetic fields to automatically identify and track tags attached to objects. The tags contain electronically stored information. Passive tags collect energy from a nearby RFID reader's interrogating radio waves. Active tags have a local power source such as a battery and may operate at hundreds of meters from the RFID reader. Unlike a barcode, the tag need not be within the line of sight of the reader, so it may be embedded in the tracked object.

Scope

The scope of this project is integration of RFID, IOT and Big Data. Multi User, Multi Account ATM Card is implemented. The user behavior is tracked using HMM Model and Formulae Authentication is implemented for Security. Easy and comfortable ATM Transaction with security. Multiple user bank accounts can be identified by the RBI.

Existing System

In the existing system, each user has separate ATM card for each bank transactions. During money withdrawal, the user needs to access bank account in which there is money. This becomes a tedious process. There is no RFID technology used in the existing system.

V. 'Multi Bank Family Card' Principle Of Operation

In the proposed system, integration of Big Data, Business analytical and RFID like technology is supposed to be recent trends in IT. It is most challenge oriented activity. In our project implementation, we are developing this application for a Banking sector particularly for a Debit / ATM \card section. We use RFID smart card as ATM Card for transaction. User can create account and get the ATM card from the bank. He can integrate all his accounts in other banks in this single card with unique PIN number accordingly. User behavior is monitored through HMM Model and he can set up a formula based authentication. He can include all his family members' accounts details also in the same card. He can withdraw cash from their accounts after successful authentication of the corresponding PIN numbers.

The project workflow is as follows: first the user wants to create an account and then they are allowed to access the network. Once the user creates an account, they login into their account and request the job from the Service Provider. Based on the user's request, the Service Provider will process the user requested job and respond to them. All the user details will be stored in the database of the Service Provider. In this project, we will design the User Interface Frame to communicate with the server through network coding using the programming Languages like Java. By sending the request to Server Provider, the user can access the requested data if they authenticated by the Service Provider. Bank Service Provider will contain information about the user in their Data Storage. The Bank Service provider will maintain the all the user information to authenticate when they want to login into their account. Using single card like credit and debit for entire family members. But maintain unique PIN numbers for different banks. We will provide a button add "Family card" in our user card. Now user can add his family members bank ATM details also along with pin number details. User can include like further bank account no, bank name, pin number same way for other family members also. Hidden Markov model is used for user behaviour analysis of cash withdrawal. Hidden Markov model is applied to understand user's money withdrawal sequence which means first condition is total amount withdrawal in every month. Second one is frequency of withdrawal of money using credit card. User can withdraw the cash as per money requirement and time frequency is also monitored & recorded. During registration of the card user has to give a formula for secured authentication system user can also add multiple bank accounts in single card. In this project, we provide security by using formula like (A+B-

C) while registration. In this formula using alphabets and two operators like (+ and -). The formula is constant, but numbers will randomly change for every transaction. User is not required to provide the formula at any time, user is only required to submit the answer after substitution of the corresponding values in their formula. This formula based authentication is required only when user tries to withdraw money beyond the permitted 10% extra and increases the withdrawal frequency.

Once user is registered by specifying his master bank account details & formula for authentication. Now user can add his family card details also.

VI. Architecture Diagram

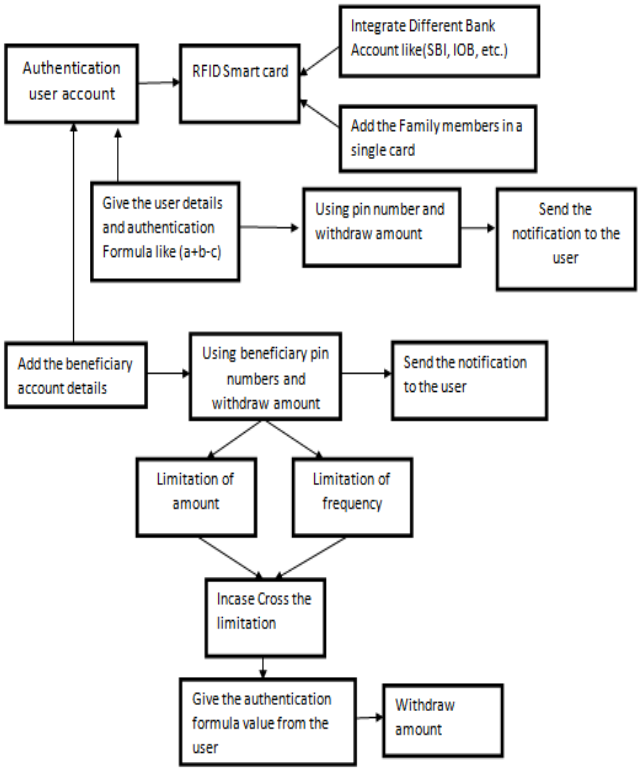

Figure.1. Architecture diagram of multi bank family card

VII. Advantages

- This system really awards multiple ATM card on rotation.
- User can withdrawal cash from one single ATM card from their family members account.
- Hidden Markov model is used for user behavior analysis of cash withdrawal
- Security is ensured by the implementation of formula based authentication
- Big data is included in the system for analyzing huge volume of data.

VIII. Dataflow Diagram

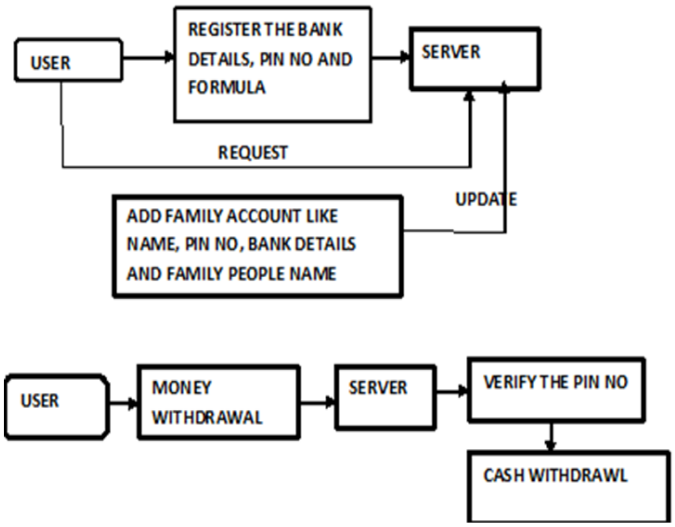

Figure.2. User registration and withdrawal workflow

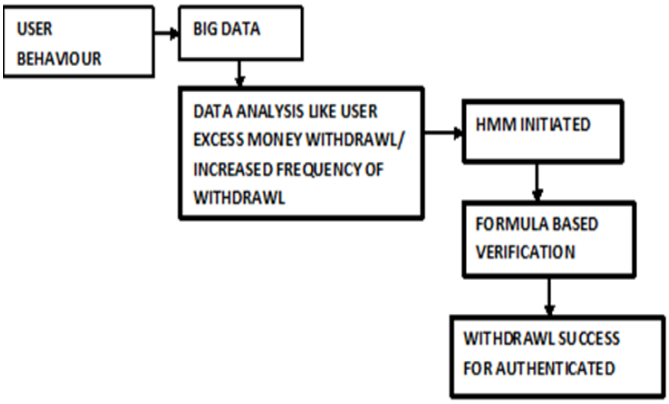

Figure.3. User behavior analysis workflow

Conclusion

In this project, we have implemented to integration of multi bank multi user in single card with user behavior monitoring using hmm & formula verification. The new system helps them to do user can create account and get the RFID smartcard. Then user can add the beneficiary or family members and he can integrate all beneficiary bank account details. Also other banks can be integrated in this single card with unique PIN numbers accordingly. Every user can withdraw amount from the unique pin number. Authorized user can only get an authentication formula to the particular account. User behavior is monitored based on every user's money withdrawal sequence, which means first condition is every month user can withdraw a limited amount. Second

one is Frequency of withdrawal of money using credit card. User can withdraw the cash as per limited money requirement and time frequency is also monitored & recorded. it is very useful for withdraw amount in without time delay.

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