Integration of Multi User in Single Card Using HMM and Formula Authentication

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Abstract : Big-data analytics would definitely lead to valuable knowledge for many organizations. In the Existing system, big data is really opportunity based environment. Technological development and advances for industrial systems, reliability and their operational risks were examined. In the proposed system, Integration of Big data, Business analytical and RFID like technology is supposed to be recent trends in IT. It is the most challenge oriented activity. The Modification, which is our implementation, This application is developed for a Banking sector particularly for a Debit/ ATM card section. Use RFID smart card as ATM card for transaction. User can create account and get the ATM card from the bank. It can integrate all his accounts in other banks can be integrated in this single card with unique PIN numbers accordingly. User behavior is monitored through HMM model and he can set up a formula based authentication. It can include all his family member's accounts details also in the same card. It can withdraw cash from their accounts after accounts after successful authentication of the corresponding PIN numbers.

Index Terms – RFID smart card, HMM,Formula Verification.
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I. INTRODUCTION

Information Technology creates new improvement opportunities, it not only introduces convenience in past. Modern business Operations having lot of improvements at present by some data mining techniques and advances of Business Intelligence (BI) methods. Nowadays, the massive amount of data available for all kind of industrial application is in the "Big Data Era". The main example, the cloud service has been assumed as the data warehouse. This data ware house provides the successful uses of source of data. The frequently used data sources can be collected by RFID (radio frequency identification). Generally, RFID is the technology using in electromagnetic fields to automatically identify and track tags attached to objects and it is a kind of wireless sensor networks. Internet of thinks consist of some efficient devices, those are capable of providing communication among them in the internet environment. Also the devices having the features of Typical banking software and its interfaces allow commercial banks to connect to other modular software and to inter banking networks. There are two kinds of banks:

1) Retail Banks: Commercial or retail banks are known as the core banking which record and manage the transactions by customers to their accounts.
2) Trading Banks: All banking and other financial institutions have areas which they specialize in. A data warehouse is totally designed for doing different jobs. It is designed to give people information rather than data. In this project the customer's behavior analyzed by the bank server using data warehouse. By analyzing the customer's data, it provides good quality information for an organization. Banking system consists of user accounts, money transfer, withdrawal, deposits, etc. These all represent tables or entities that can be manipulate with MySQL. MySQL based database systems supports something called "transaction processing", where a process consists of multiple small processes acting as a single unit. If one process fails, the whole operation should fail. In a banking system this is important because a small failure can result in a big loss. This application is mainly used for a Banking sector for a Debit / credit card access for the purpose of customer's money transactions in case of lack of money in particular account. User can create account and get the RFID card as ATM card for transactions from the bank. User can add the beneficiary 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 only can get an authentication formula like (A+B-C) 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. If the transaction limit exceeds means beneficiary users will use authentication formula with authorised permission. After verification of the formula, user can allowed to withdraw an amount.

II. BANKING SECTOR AND BIG DATA

The IT revolution had a great impact on the Indian banking system. The use of computers has led to the introduction of online banking in India. The use of computers in the banking sector in India has increased many fold-after the economic liberalisation of 1991 as the country's banking sector has been exposed to the world's market. Physical as well as virtual expansion of banking through mobile banking, internet banking, tele banking, bio-metric and mobile ATM is taking place since last decade and has gained momentum in last few years. According to the ATM industry Association, the customer is identified by inserting a plastic ATM card with a magnetic stripe or a plastic smart card with a chip that contains a unique card number and some security information such as an expiration date or CVVC. Authentication is provided by customer entering a Personal Identification Number (PIN) which

must match the PIN stored in the chip card or in the issuing financial institution's database. ATMs are connected to interbank networks, enabling people to withdraw and deposit money from machines not belonging to the bank where they have their accounts. ATM card only can be provided for a single user for single account. It is the main drawback for the ATM card which is not affordable for security issues nowadays. Typically bank organizations not providing the ATM card to multi user accounts those are merged to each other. Most banks have failed to utilize the information within their own database. Big data is huge step towards the development of banking industries. There is some Advantages of big data for the banking industry: 1) Fraud detection& prevention, 2) Enhanced compliance reporting. Big data supports customer segmentation, which is used allow banks to better target their clients with related marketing. Big data plays a pivotal role in integrating the banks requirements into a centralized, functional platform. This reduces the banks chances of losing data, or ignoring fraud.

II.1. DATA INTEGRITY

Data integrity is the important feature of MySQL based databases. It deals with making sure the data is validated across all the tables and there is no duplicate, unrelated or unauthorized data inserted in the system. In this project, the number of customer accounts integrated to each other by using data integrity. Customer data integrity is the process of consolidating and managing customer information from all available sources, including contact details, customer valuation data, and information gathered through merging them each other. Customer Data Integrity (CDI) is the important and essential element of customer relationship management (CRM). Although banking organizations have been gathering customer data for a good number of years, it hasn't always been managed very effectively. As a result, banks may maintain outdated, redundant, and inconsistent customer data. Although the 92% of banks surveyed believe having an integrated view of customer data is either "critical" or "very important". Here the main aim of the project is integration of multi user as single with user behavior monitoring using HMM & formula verification. User behavior is monitored is based on every money withdrawal sequence, which means first condition is every month user can withdraw a limited amount. Second one is Frequency of withdraw of money using credit card. Credit card is the payment card issued to the user as a system of payment. Credit card contains the following things: Issuing bank logo, EMV chip (technical standard for smart payment cards and for payment terminals that can accepted by automated teller machines), holograms photographic recording of a light field), card number, card network logo, Expiration date, card holder name, contactless chip. User can withdraw the cash by using credit card/ATM card as per limited money requirement and time frequency is also monitored and recorded. It is very useful withdraw amount in without time delay. In this project not only integrating the number of customers account, it is possible to integrate the RFID, Big data, and IOT. Data integrity is not to be confused with data security; it is the discipline of protecting data from unauthorized partied. There is some problem while implementing data integrity. Any unintended changes to data as the result of a storage, retrieval or processing operations, including malicious intent, unexpected hardware failure, and human error, is failure of data integrity. But here the difficulties are overcome by the security aspect Hidden Markov Model (HMM). The main aim of the project is to integrate three features 1). Hidden Markov model based user behavior analysis 2). Secured formula based authentication 3).Accessing multiple accounts via single family card. The detailed concept of the project is to find users behavior pattern of withdrawal of money through ATM. We deploy hidden Markov model to identify or detect the user behavior pattern.
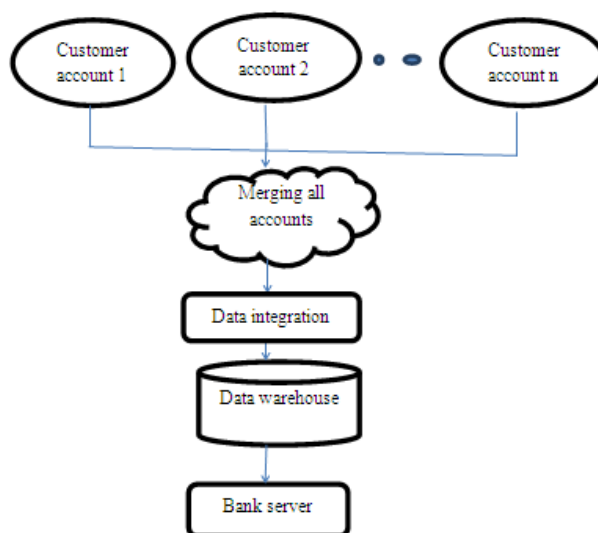

Fig 1: Data integration on multi user accounts

II.2.RADIO FREQUENCY IDENTIFICATION

RFID (Radio Frequency Identification) is the latest technology to be used in many real time applications. Unlike EM (Electro-Mechanical) and RF (radio frequency) systems, which have been used in many applications for decades, RFID based systems move beyond security to become tracking systems that combine security with more efficient tracking of data throughout the bank server, including easier and faster retrieval of money from multi user account. Generally, RFID is a combination of radio

frequency technology and microchip technology. The information contained on microchip is the tags affixed to bank server. There are some benefits by using radio frequency identification. The main use of RFID reduces the amount of time required to perform circulation operations. The most significant time savings are attributable to the facts that information can be read from RFID tags much faster than from barcodes and that several items in a stack can be read at the same time. While initially unreliable, the anti-collision algorithm that allows no collision between the several numbers of user accounts. There is no false alarm than with older technologies once an RFID system is properly tuned.
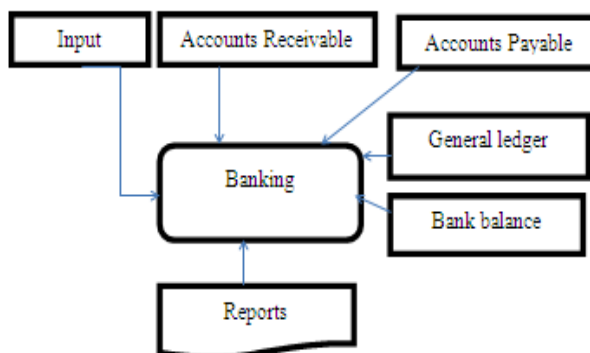

Fig 2: RFID based banking system

II.3. HIDDEN MARKOV MODEL

Hidden Markov model (HMM) is the 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. The mathematics behind the HMM were developed by L. E. Baum and coworkers. It is closely related to an earlier work on the optimal nonlinear filtering problem. In simpler Markov models, 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. HMM used in many applications in temporal pattern recognition such as speech, handwriting, gesture recognition, part-of-speech tagging, musical score following, partial discharges and bioinformatics. In discrete Markov model, which having finite n distinct states those are begins (at time t=1) with in some initial states. At each time (t=1, 2 …) step the system moves from current to next state (possibly as same as the current state) according to the transition probabilities associated with current state. This kind of system is called finite or discrete Markov model. The transition based on Markov property: The state of the system at the time t+1 depends only on the system at time t.

P [Xt+1=xt+1 | Xt = xt, Xt1=xt1… X1=x1, X0= x0 =P [Xt+1=xt+1| Xt = xt]
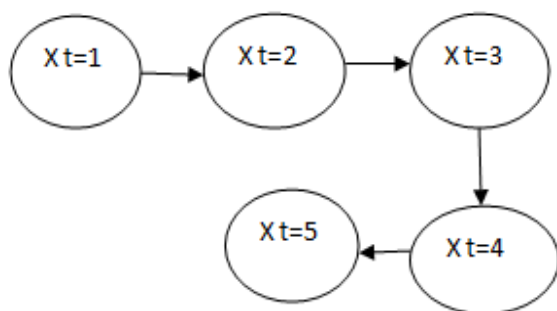

Fig 3: Markov state transitions

Markov model is applied to understand users 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. User two to three months transactions are monitored & recorded in the main server. User behavior pattern is analyzed using Hadoop for Big data implementation. Let us assume user is withdrawing Rs.10, 000 in every transaction and the total number of frequency is 3 per month. So user is withdrawing Rs.30, 000 on total per month in 3 frequencies. So now hidden Markov model is initiated to analyze the behavioral pattern using Big data. The logic which are implementing is allowing user take 10% Extra of overall withdrawal of money per month in single transaction or frequency.

Permitted extra amount of Withdrawal / Transaction = Total amount of withdrawal /month*10%

  = 30,000*10/100

  =3000

So server is allowed to take Rs.13, 000 per transaction or frequency. If user takes more than Rs.13, 000/ transaction then the hidden Markov model will notify the formula based authentication process to really verify / identify the user's behavior.
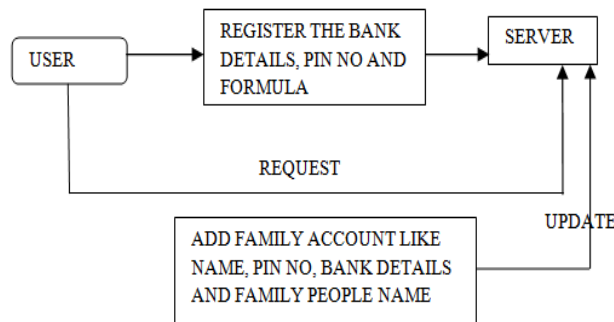

Fig 4: Multi user integration in bank server

The project concept is to find user's behavior pattern of withdrawal of money through ATM. User can withdraw cash from one single ATM card from family members account. Hidden Markov model used for user behavior analysis of cash withdrawal. Security is ensured by the implementation of formula based authentication. Formula based authentication for secured transaction, in this can set two operators (+,-) and should have 3 alphabet in total. For Example,

A + B - C

OPERATORS
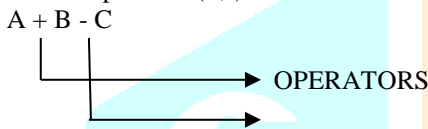
Formula is fixed by user and never expected to provide to the big data server at any period of time. During verification of formula based authentication, user will be displayed with set up characters (starting from A to Z) & random numbers displayed at the bottom of the corresponding numbers.

A B C

2 3 1............

User need to substitute / apply the formula and arrive at the final answer, which is verified by the big data server. The numbers displayed, the alphabets are changed randomly for every display. Now our output is calculated as, $2(A) + 3(B)-1(C) = 4$. User is not required to provide the formula 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 registered by specifying his master bank account details & formula for authentication. Now user can add his family card details also.
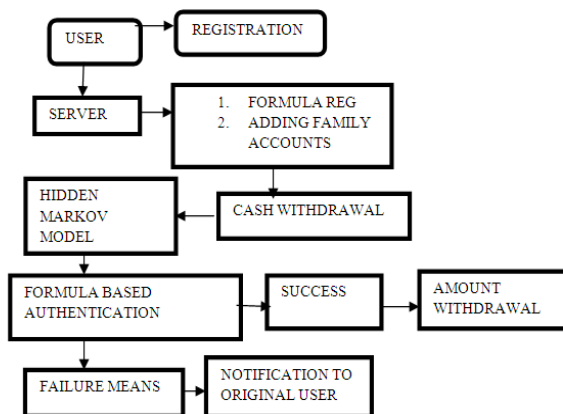

Fig 5: Illustration of Multi user family card

Button add "Family card" is provided in the user card. Now user can add his family member's 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.

III. TABLE: SUMMARY OF DIFFERENT FRAMEWORK REVIWED IN THIS PAPER

Title	Author name	Disadvantage	Advantage
Noise Tolerance Under Risk Minimizati on	Naresh Manwani, P. S. Sastry,	We show that risk minimization under 0-1 loss function has impressive noise tolerance properties and that under squared error loss is tolerant only to uniform noise; risk minimization under other loss functions is not noise tolerant.	We analyze the noise tolerance properties of risk minimization (under different loss functions).
Coordinatio n of a supply chain with a loss-averse retailer under two types of contracts	Kuiran Shi Tiaojun Xiao*	Here one manufacturer and -retailer supply chain Facing uncertain demand. The manufacturer sells a perishable product to the retailer.	It is to design the supply contract that provides a win—win coordination mechanism between the Manufacturer and the retailer.
Developing Data Cloud Services in Various Environme nts	S.Nageswara Rao B.R.M.Reddy	Based on a service-oriented architecture (SOA), this system uses a number of software services (SaaS), to perform different tasks.	we propose to use both cloud computing and IoT as an enabling infrastructure for developing a vehicular data cloud platform
A Novel Approach of Mining Semantic Context Information for Intelligent Video Surveillanc e of Traffic Scenes	M.Kameshwara Rao, P. Bhavya Sree2	This is an ambitious goal which has attracted an increasing amount of researchers to solve commonly encountered surveillance problems of Object detection, classification, tracking, and abnormality.	we attempt to mine semantic context information including object-specific context information and scene-specific context information to build an intelligent system
Security threats on cloud computing vulnerabilit ies	Te-Shun Chou	The security issues associated with cloud computing make us vulnerable to cybercrimes that happen every day.	Three cloud service models were compared to demonstrate the techniques that hackers used against cloud computing systems.
Methods for Anomaly Detection: a Survey	Leonid Kalinichenko Ivan Shanin Ilia Taraban	The data object is "Dissimilar" to the other observations in the dataset. It is very important to detect these objects during the data analysis to treat them differently from the other data.	we review different approaches to the anomaly detection problems, their applications and specific features
Application Framework and Data Processing in IoT based Email System	Vishakha More Prof. RaghibNasri	Multi-sensors or actuators continuously send the information or alert messages. There is need to store, process and analyze the data generated by those things.	The Internet of Things (IoT) has provided a promising opportunity to build powerful applications by leveraging the growing ubiquity of Radio Frequency Identification (RFID) and wireless sensors devices.
The Impact Of Security And Scalability Of Cloud Service On Supply Chain Performanc e	Olatunde A. Durowoju Hing Kai Chan Xiaojun Wang	There exists a need to examine its impact on business Operation and treat it as a strategic tool rather than merely 'the new way of computing'.	The Aim is to show that Cloud service can only prove beneficial to supply partners under a highly secured, scalable computing environment and hope to lend credence to the need for system

On-Line One-Class Support Vector Machines. An Application To Signal Segmentation	Arthur Gretton FrkdkricDesobry	The solution of the optimization problem leads to decision function. This classifies new points as inliers and outliers.	we describe an efficient algorithm to sequentially update a density support estimate obtained using one-class support vector machines
The marginalized likelihood ratio test for Detecting abrupt changes	Fredrik Gustafsson	The problem of detecting abrupt changes in linear system and signals occurs in many applications.	MLR test is introduced for eliminating three shortcomings of GLR, while preserving its applicability and generality.
Anomaly Based Intrusion Detection-A Review	Abhinav S. Raut, Kavita R. Singh	Anomaly detection is an active problem that has been studied within diverse research area and the application domain.	It is aim to detect attacks against information systems in general. Anomaly detection is an active problem that has been studied within diverse research area and the application domain.
An Approach to Spacecraft Anomaly Detection Problem Using Kernel	Ryohei FUJIMAKI Takehisa YAIRI Kazuo MACHIDA	Development of advanced anomaly detection and failure diagnosis technologies for spacecraft are a quite significant issue in the space industry.	It proposes a novel "knowledge-free" anomaly detection method for spacecraft based on Kernel Feature Space and directional distribution,

IV. CONCLUSION

The aim of this paper is used to debit / credit card access for the purpose of customer's money transactions in case of lack of money in 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 are multi user can be access within a single ATM card. In the existing system, every user having a single account and have a single ATM card for credit or debit card process. This is very tedious task for withdraw amount in case of lack of money in our account. At present ATM card transaction details are maintain their day today. Then all the transaction details are sent by the user. 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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