ANALYZING HUMAN BEHAVIOR FOR FINANCIAL FRAUD DETECTION

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Abstract : Fraud typically means that wrongful or criminal deception meant to result in monetary or personal gain. Financial fraud can be done by any persons ranging from senior managers to payroll employee that involves money. There are many techniques that are developed to identify, analyze and prevent financial fraud behavior. The most popularly known technique is the fraud triangle theory which is associated with classic financial audit model. We proposed a knowledge framework that identifies and outlines a group of individuals in financial organizations like banking where there are chances of committing fraud. Fraud Find approach works in a continuous audit that will be in charge of collecting information of agents installed in user's equipment. It is based on semantic techniques applied through the collection of phrases taken from the users under study for later being transferred to a repository for later analysis. This system contributes for the field of cyber security, for the reduction of financial fraud. The proposed technique works with an organization that comes under banking sector which will be our data to study. An agent is an application installed in the terminals of the users in order to obtain the data that they generate from the different sources of information that reside on their equipment. We wish to form different patterns like classifications, taxonomies, or typologies that represent the data. The various categories of data under fraud triangle are pressure, opportunity and justification.

I. INTRODUCTION

Fraud is a civil law violation and is also a crime. In recent year financial fraud, including credit card fraud, bank fraud, insurance fraud, financial statement fraud, corporate fraud, security fraud, money laundering has attracted a great deal of concern and attention. Fraud is that a wrongful or criminal deception meant to result in monetary or personal gain. Financial fraud is becoming a serious problem in the economic society. It makes a horrific threat to the economic condition of an organization or even the government. There are several other cases which cost a huge amount of damage to the economy. For example, investment bank Lehman, with $600 billion in assets, failed in late 2008. Investment bankruptcy is the largest bankruptcy in the past history that gave a spark to the worldwide financial crisis. A large number of research paper has been published on credit card fraud, insurance fraud, financial statement fraud due to their relatively large impact on world economy. Traditional approaches for detecting frauds became inefficient due to introducing of new methods of committing fraud by fraudsters. Data mining can be applied to this problem because techniques used in data mining-based approaches can detect small deviation in large datasets. An efficient approach to finding the solution of financial fraud problem is to apply the data mining techniques for classifying suspicious transaction, which are further investigated for unfitting transaction category or fraud.

II. TYPES OF FINANCIAL FRAUD

There are different types of financial frauds that occur in our day to day life. According to the impact of these frauds on the economy, they are categorized namely as credit card fraud, financial fraud, money laundering, insurance fraud etc.…

CREDIT CARD FRAUD

Credit card fraud generally falls under bank fraud category. Credit card fraud is defined as illegal access and unauthorized use of the credit card of a person without his involvement or his permission. There are two different types of credit card frauds. The first one is counterfeit fraud where the fraud is done by fraudsters or a group of fraudsters. This kind of credit card fraud will have a huge impact on thousands of card holders. The second type of credit card fraud is that it involves the use of lost or stolen cards. This kind of credit card fraud will not influence immense number of cardholders. Fraudsters basically use phishing attacks in which he himself will act as if he is the original financial officer in order to acquire the card details.

FINANCIAL FRAUD

Financial fraud involves the collection of financial statements reported by an organization about its financial control flow, financial results, their loans, debts, expenses, income, profits, losses in addition with the expected future business activities. Financial statements play a key role in smooth running or failure of the organization. Financial statements fraud involves the reshaping of the original organizational structure in order to make the company more bankable.

INSURANCE FRAUD

Insurance fraud is the act of wrongful intension of fraudulent payback committed with the insurance company. Insurance fraud can be done by fraudsters at any stage of insurance process. The insurance process includes claims, eligibility, billing, application, rating, etc.….Insurance fraud occurs in various organizations like crop insurance, healthcare

insurance, automobile insurance etc.…The automobile fraud can be done by the fraudsters by showing a fraud injury. Health care insurance fraud can be done by using duplicate claims, unnecessary medical services. In crop insurance fraud the customers increase the losses occurred due to natural calamities, disasters or by a reduction in prices.

MONEY LAUNDERING

Money laundering is defined as a financial fraud in which the fraudsters make the use of dirty or illegal money called black money and make them into lawful and useful money. Money laundering is where fraudsters engage deliberately in monetary transactions.

III. DATA MINING TECHNIQUES USED FOR FINANCIAL FRAUD DETECTION

Data mining techniques are used to analyze large sets of data and make an appropriate view by which one can easily detect anomaly or distortion. There are six different classes of data mining as visualized in fig.2. that are considered to be useful for detection of financial fraud. Fig.1. illustrates the process of data mining.

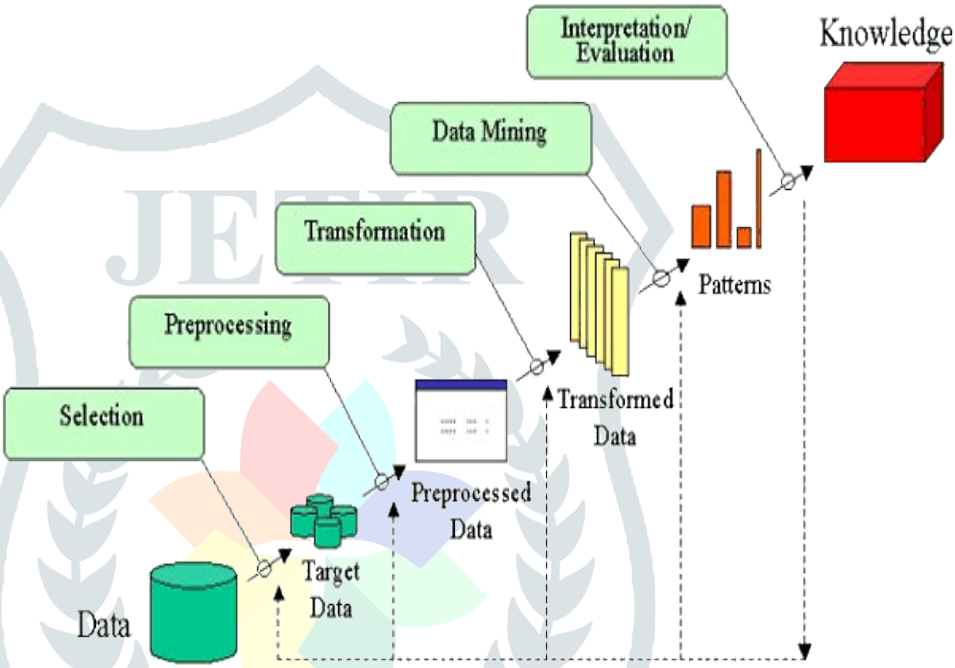

Fig.1.DATA MINING PROCESS

CLUSTERING

Clustering is defined as a task, where in the object sets which are grouped together in a way that objects that belong to same group are much like one another than the other objects from other different groups. Clustering in other ways is called as Unspervised learning which is used for partitioning or data segmentation.

CLASSIFICATION

Classification model can be used for prediction of class labels of unknown objects for differentiating these objects from other objects of some class label. Few frequently used classification techniques are Decision tree, Bayes method, neural networks, support vector machines, etc. Classification is the widest and most important approach used for data mining in detection of financial fraud.

PREDICTION

Prediction focuses on continuous valued functions. Prediction doesn't work on categorical functions or functions of discrete values. Most widely used prediction techniques are logistic model prediction technique, neural networks, etc.

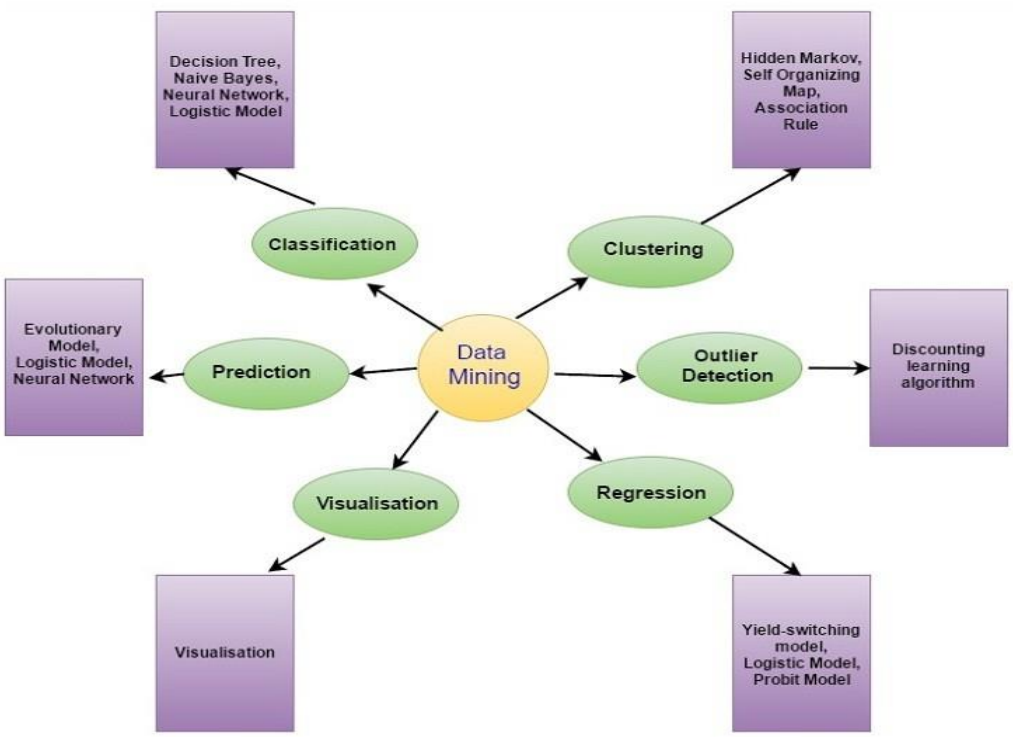

FIG.2.ELEMENTS OF DATA MINING

OUTLIER DETECTION

Outlier is the misguidance of an observation with other observations in order to find suspicions that the observation is produced by some other mechanisms. Most commonly used outlier detection techniques are algorithm for discounting learning.

REGRESSION

Regression is a mining technique used for predicting a number. Several predictions done by using regression are sales, house costs, mortgage values, distance, temperature, or square footage, etc. The primary component of a regression task is the dataset. There are three types of regression techniques. They are polynomial, linear and logistic regression.

VISUALIZATION

Visualization is the most popular and common term that describes insignificant data. Visualization is the methodology that extract clear patterns.

IV. FRAUD TRIANGLE THEORY

Fraud triangle theory is the best technique to explain the occurrence of fraud, which was proposed by Donald R. Cressey who wrote various books for prevention of crime and he is an expert in the field of crime sociology. According to this theory, Fraud can be categorized into three critical classes as pressure, opportunity and rationalize. The first category pressure states that the fraudster did the fraud because of the pressure on him to do that kind of activity. Most of the financial frauds fall under this category. The second element of fraud triangle theory is the opportunity, that is whenever a chance or opportunity comes to fraudster to commit financial fraud then he will do fraudulent activities. The third element of fraud triangle theory is rationalized, in which the fraudster behaves as if he is transferring money of his own to the actual client.Fig.3. describes fraud triangle theory.

Fig.3.FRAUD TRIANGLE THEORY

V. PROPOSED FRAMEWORK

The proposed framework operates in a continuous approach to discover financial fraud within an organization. The proposed framework operates in the continuous auditing approach to discover financial fraud within an organization belonging to the banking sector which will be our main study environment and focused on the fraud triangle theory with the human factor considered as an essential element. Fraud Find is proposed with the objective of analyzing large amounts of data from different sources of information for later processing and registration. The agent is an application installed in the workstations of the users (endpoints), in order to extract the data that they generate from the different sources of information that reside on their equipment.Fig.4. illustrates the architecture of the proposed system.

The proposed system also focused on fraud triangle theory with human factor considered as an essential element. Fraud find is proposed with the objective of analysing large amounts of data for processing. K-Means clustering is meant to partition n different objects into k different clusters.

ADVANTAGES:

- Identifies the actual fraud
- Use of algorithm
- Continuous monitoring

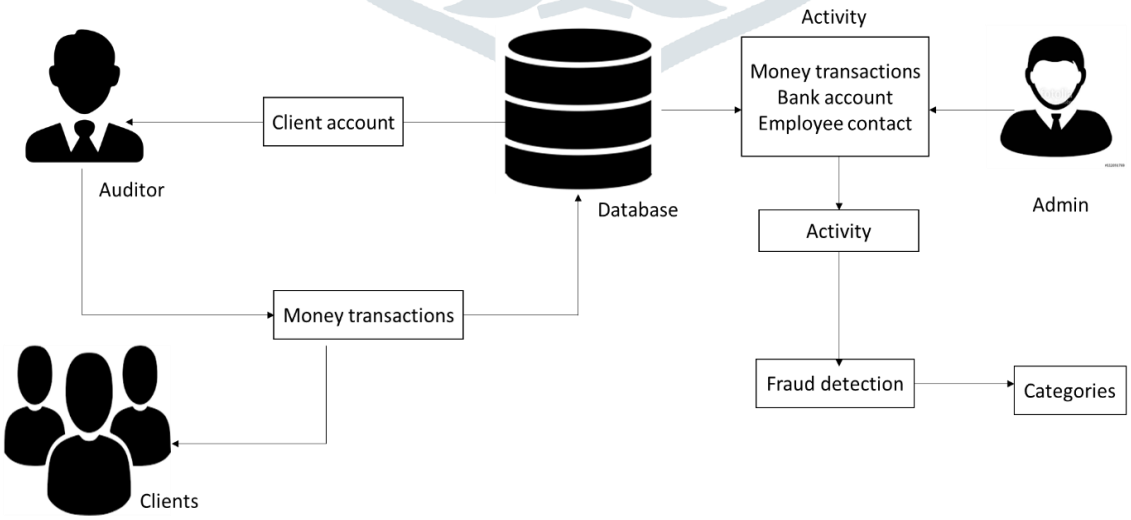

Fig4. ARCHITECTURE OF THE FRAMEWORK "FINANCIAL FRAUD DETECTION"

VI. CONCLUSION

The present work proposes Fraud Find, a conceptual framework to detect financial fraud supported by the fraud triangle factors which, compared to the classic audit analysis, makes a significant contribution to the early detection of fraud within an organization. Considering human behavior factors, it is possible to detect unusual transactions that would have not been considered using traditional audit methods. The collected data is examined using data mining techniques to obtain patterns of suspicious behavior evidencing possible fraudulent behavior. Nevertheless, the legal framework and the different regulations that are applied in public and private institutions of a region represent a high risk for the non-implementation of this architecture as an alternative solution. Future work will have as its main objective the implementation and evaluation of the framework as a tool for continuous auditing within an organization.

VII. REFERENCES

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