

Fraud Detection: Using Of Data Mining In Accounting Information System

Abdallah Jabari¹, and M.Suyunus¹

¹Faculty of Economics and Business, Universitas Airlangga, Surabaya, Indonesia
Abdullahacc2017@gmail.com, suyunusm@yahoo.com

Keywords: Accounting System Fraud Detection, Data Mining, Fraud Detection.

Abstract: The process of data mining is obtains the required data for analysis, study, take preventive measures, administrative decisions and fraud detection. This study aims at detecting fraud in evading the payment of the cheques and promissory notes payable by the customer in the Palestinian work environment through the extraction of data from the accounting information system and applied them on “Sbitany Home” Company that one of the largest Palestinian companies that use the system of sale by instalments through promissory notes and cheques very large. A qualitative research methodology is adopted in undertaking the investigation to understand the actual conduct of practices that aims to recommend improvements for fraud control, detection and prevent it through data mining to determine solutions to the problem. The results indicate that the company has a lot of cheques and promissory notes that are not paid very much, therefore the company suffers from this scourge very much by many fraudulent customers, which affects its activities and profits. The data was mining from the accounting information system "Priority" which is using in this company. The research methodology used these data according to the Microsoft Excel and analysis and extract the results related to the detection of this problem and prove the existence of this problem. As a result, the study provides information on the causes of evading the customers the payment and solutions and suggestions that help to reduce them very significantly and therefore the researcher sees the need to participate between all competent authorities concerned with these matters to eliminate this scourge that threatens companies in particular and the State and society in general.

1 INTRODUCTION

Fraud detection is the identification of fraudulent behavior once it has occurred. Once detection has occurred action can be taken to limit the fraudulent activity. To accomplish this, fraud detection requires constant monitoring as well as constant evolution. Fraud detection methods are in a constant state of change or flux due to the nature of fraud. This is because as soon as detection of a type of fraudulent behavior takes place, criminals create new plans and schemes for fraud. Furthermore new criminals entering the fraud business may carry out fraud using existing methods causing some fraudulent activity to be cyclical. Fraud detection therefore can be seen as being part of an overall strategy which in many areas has become a business critical issue. This is because it being both common place and difficult to combat. Fraud has been found difficult to combat due to troublesome and complex nature of designing measures to prevent it (Brennan, 2012).

Accounting fraud is intentional manipulation of financial statements to create a facade of a company's financial health. It involves an employee, account or the organization itself and is misleading to investors and shareholders. A company can falsify its financial statements by overstating its revenue or assets, not recording expenses and under-recording liabilities (Gerety & Lehn, 1997).

Data mining is an interdisciplinary subfield of computer science. It is the computational process of discovering patterns in large data sets involving methods at the intersection of artificial intelligence, machine learning, statistics, and database systems. The overall goal of the data mining process is to extract information from a data set and transform it into an understandable structure for further use. Aside from the raw analysis step, it involves database and data management aspects, data pre-processing, model and inference considerations, interestingness metrics, complexity considerations, post-processing of discovered structures, visualization, and online

updating (Chakrabarti et al., 2006). Data mining tools take data and construct a representation of reality in the form of a Data mining activities fall into three general categories (Desai & Deshmukh, 2013). Data mining is the analysis step of the "knowledge discovery in databases" process, or KDD (Fayyad, Piatetsky-Shapiro, & Smyth, 1996).

One of the systems which collates and classifies data collected by organizations is the Accounting Information System (AIS). This system provides financial information that can be used to plan, evaluate and diagnose the impact of operating activities and identify the financial position of the organization. Given that these systems today collect vast amounts of data, this data can be 'intelligently' analyzed by data mining technologies - sophisticated and powerful cutting-edge technology that enables the extraction of hidden predictive information from a large database (Kurt, 2004).

An accounting information system (AIS) is a system of collecting, storing and processing financial and accounting data that are used by decision makers. An accounting information system is generally a computer-based method for tracking accounting activity in conjunction with information technology resources. Accounting information systems are designed to support all accounting functions and activities including auditing, financial accounting and reporting, managerial/ management accounting and tax (Palshikar, 2002).

Justification for this research Due to the use of the companies working in the private sector in Palestine installment sales system by cheques and promissory notes in a very large percentage which make these companies face problems from the customer's fraud and evasion in the payment of the value of cheques and promissory notes. Installment sales is by using promissory notes and cheques as a guarantee for the collection of amounts due on a monthly or semi-annual or annual according to the agreement between the company and customers, with the knowledge that most of the payments are monthly.

Based on the above justification for the research what happens when using the sales system in this way we produce a problem. The problem is the customer's fraud and evasion in the payment of the value of cheques and promissory notes at a specific time after the purchase between the company and customers, making promissory note unpaid and cheques from the bank and will therefore affect the activity of the company and its profitability and increase accounts receivable.

There is a lack of knowledge of the status of the implementation of the extraction of technological

data within the public information system in Palestine, this technique "Data Mining" is applied and the best model for implementation and extraction for data to look for trends and patterns in accounting data that reveal fraud in Palestine. And therefore the objective of this study is detect fraud through Data Mining of Accounting Information System and Clear to prove the role of accounting information system in detect and prevent fraud, this could lead to prevent fraud in the future.

The next sections contains the literature review and the theory to adopt the principle of data mining through the accounting information system to detect fraud Furthermore section 3 documents the research method . The results and discussions are presented in section 4 and finally section 5 concludes the paper.

2 LITERATURE REVIEW, THEORIES AND PREVIOUS STUDIES

2.1 Data Mining and Fraud Detection

Data mining is a process that uses a variety of data analysis tools to discover of data in all its forms and types that may be used to make valid predictions (Miller & Han, 2009). Data mining is capable of answering questions about the past (what has happened) the present (what is happening) and the future (what might happen). Data mining permit analysis and identification of 'hidden' relation in large datasets. By permitting this, the uncovered information previously is now covered and would give more support in the process of decision making (Nemati & Barko, 2002).

The elements of an effective and sound anti-fraud strategy, prevention, detection, deterrence, response. They are closely related and each playing its essential role in combating fraud. Fraud detection can act as a deterrent by spreading a message to potential fraudsters that the company is fighting fraud and that necessary procedures are placed to pick any unlawful activity which could have happened. A potential fraudster would desist from committing the crime if there is a possibility of being caught. Suspected and detected fraud incidents need a consistent and comprehensive response, this will spread a message across that fraud is a critical issue and that subsequent action would be taken against the perpetrator. Any fraud case which is detected and investigated should strengthen deterrence and therefore, act as fraud prevention technique or measure (Dzomira, 2015).

One of the techniques for detecting fraud by data mining is Data Visualization that the researcher can be used through following its steps of the work. Data visualization refers to the techniques used to communicate data or information by encoding it as visual objects (e.g., points, lines or bars) contained in graphics. It involves the creation and study of the visual representation of data, meaning "information that has been abstracted in some schematic form, including attributes or variables for the units of information" (Friendly & Denis, 2001).

2.2 Theories

There are several different theories that may explain the demand for audit services. Some of them are well known in research and some of them are more based on perceptions such as Information theory, visualization theory, policeman theory, Lending credibility theory, Agency theory, theory of inspired confidence.

2.2.1 Information Theory

Information theory studies the transmission, processing, utilization, and extraction of information. A principle is the information principle, focusing on the provision of information to enable users to making decisions. Investors value the audit as a means of improving the quality of financial information. (Eid, 2014). Since the information theory is, processing, use and transfer of information extraction studies, it is, according to this research can be used through the information system of any data is extracted, used and processed through this system that helps and gives management accurate and right information for decision-making such as giving information about customers before agreeing to sell them by cheques or promissory notes of exchange and thus helps to reduce evasion problem in the case that as a result of the information was positive or negative.

2.2.2 Policeman Theory

The policeman theory posits that auditing is focused on arithmetical accuracy and on prevention and detection of fraud and the auditor is responsible for search on fraud (Ittonen, 2010). The policeman theory and Information theory are considered most relevant for this study. Policeman theory is the most widely held theory on auditing until the under this theory (Salehi, 2011).

We can have advantage of the policeman's theory in this research through AIS that is regarded as a cop electronically rather checker person. Then the system

monitors and follows up sales operations through cheques from customers during the audit information and ensure the safety of all the sales process measures. In addition to that, the detection of any case of evasion and fraud, prevent and reduce them.

2.3 Previous Studies

Some previous studies have focused such as Farrell & Franco, 1999 on the responsibility of the auditor in detecting fraud and error and the extent of reduction of misinformation in the financial reports and addressed some special topics auditor legal responsibility toward others and the difficulties faced by the auditor and also discuss the development of some models and techniques that can be used by auditors in order to discover the fraud and the extent of commitment Auditor international auditing standards.

While some studies such as RamaKalyani & UmaDevi, 2012; Stolfo, Fan, Lee, Prodromidis, & Chan, 2000; Goode & Lacey, 2011; Soltaniziba & Balafar, 2015; Sharma & Panigrahi, 2013; Albashrawi, 2016 have focused on the types of fraud, including mortgage fraud, financial reporting, bank cheques in the banking sector, promissory notes, credit card. And methods of fraud detection through several ways including the method of extracting data and methods of auditing and analysis.

Some studies such as Koornhof & Du Plessis, 2000 also touched on the originators of cheating like executive managers, auditors, accountants, corporate governance, whether in the private or public sector, lenders and investors. All of these studies touched each mentioned things and put a variety of solutions to detect fraud and reduce it all analytical liquids or applied through the use of technology and data analysis.

3 RESEARCH METHODOLOGY

3.1 Type of Research

A qualitative research methodology is adopted in undertaking the investigation to understand fraudulent practices and aims to recommend improvements for fraud control and detection it and prevent it through data mining and analyze them and making decision for solution these problems.

Thus, case study research involves the study of an issue explored through one or more cases within a bounded system. I choose to view it as a methodology, a type of design in qualitative research,

or an object of study, as well as a product of the inquiry, through detailed, in-depth data collection involving multiple sources of information and reports a case description and case-based themes. The case in this study of grounded the company is suffering in Palestine by its customers as i spoke earlier about the problem of research and justification of research. Approaching the research problem using an interpretive worldview will be the most effective approach at answering the research questions.

3.2 The Type of Data and Data Collection Techniques

Through the telephone conversation, the researcher gained data from a company operating in Palestine for the last 5 years about sales through promissory note and cheques, such as total sales through them, the total commitment to pay the value of the promissory note and cheques, the total evasion value of the promissory note and cheques, the cause of fraud by customers. And all the data needed by the researcher for this study and an understanding concerning the protocols, perceptions, beliefs, experience and action activities from the respective heads of division at the group level. The telephone conversation were conducted with the highest level of division at the group level.

3.3 Data Analysis Techniques

The researcher obtained all the data related to the research, which includes the total sales of the company in general each month separately for five years, sales through cheques and promissory notes, cheques cheques and promissory notes unpaid with the knowledge of the reason of evasion by the customer via e-mail. The researcher used the Microsoft Excel to arrange the data that was random and needed to be revised and arranged.

4 RESULTS

The Priority system is AIS that is used by the company. Through this system the customer data is entered, a large part of which is from the request form, and a new account is created that this company used it in order to get information around customers before sell them . The sale is then recorded by installments through the accounting information system used by Sbitany Home in recording all its activities. The data

for the company's sales were extracted for the past five years from 2012-2016. In addition, based on the ability of the system to extract all the required data, the sales data were extracted through cheques and promissory notes as follows:

1. In the beginning, the received cheques are entered from the customer in the system through make of a check receipt and thus cheques are entered into the cheques box in the system.
2. The next step will be to send to the bank for collection and thus get them out of the system from the cheques box to the bank's box in accounting system.
3. The bank will in turn collect the cheques from the customer. If the customer fails to pay the cheques will be returned to the company and then the accountant will then re-enter the system in the system.
4. Choose financials that contain from the main list.
5. Go to the cash managements that contain multiple options related to the cashiers.
6. Choose the cash management report in order to get the report.
7. Choose Cheques box and then the system will mining all the data related to the cheques according to the period specified by the user, as it contains the Cheques box to determine the time period to obtain the data.

As for promissory notes, the output of data on them is in the same manner as for cheques, but the bond fund should be selected instead of the cheques fund. There are several different things in dealing with the promissory notes in the system:

1. When the customer is sold through promissory notes they are entered into the promissory note fund in the system.
2. Promissory notes are not sent anywhere to collect, but they remain in the company and are collected on the date specified directly by the customer in the company.
3. In the case of a customer's obligation to pay the value, it is removed from the system and therefore is not considered an unpaid promissory note. In case of non-payment, the promissory note remains in the system and thus the fraud process is obtained.
4. In the process of extracting data relating to unpaid promissory notes, their fund is selected in the system and a specific date such as the date of the day is established. Therefore, any promissory note appearing in the report prior to this date is an unpaid promissory note and that he is still in the company and thus the existence of the process of fraud.

After mining all the required data from the system and following the steps of identification and use of the accounting information systems in extracting the required data, then the data was obtained as complete at the end of the research in the tables that contain the data after processing, and to remove data that is not important or required for research.

The results of the percentage of sales by cheques and promissory notes of sales in general for each year from 2012-2016. The percentage of promissory notes sold was 13%, 8%, 9%, 9% and 11%, respectively. The percentage of sales by cheques was as follows: 45%, 46%, 36%, 27% and 11%, respectively. These percentages and figures show that the company uses the system of sales by cheques and unpaid promissory notes, and therefore, after knowing the existence and use of this method by the company has been working on the extraction of data on the escape by customers.

According to the ratio of sales of cheques and promissory of exchange, the results of the table 1 which contains the ratio of unpaid promissory notes of exchange and cheques from the total promissory notes and cheques sold for five years each year from 2012-2016 were as follows: 16%, 9%, 14%, 6%, respectively, and the percentage of cheques returned 16%, 7%, 9%, 20% and 42%, respectively. This table shows that there is a large amount of cheques and promissory notes, the existence of the problem that lies in the evasion of customers in the payment of the value of both promissory notes of exchange and cheques on time and which have been talked about the first unit of the search.

Table 1: Percentage of cheques and promissory notes due from cheques and promissory notes sold.

Year	Total P.N sold	Total Cheques sold	%Total Unpaid P.N of sold	%Total Cheques Returned of sold
2012	1.549.884	5.324.481	10%	16%
2013	721.945	4.211.325	16%	7%
2014	983.266	4.127.559	9%	9%
2015	1.152.234	3.268.824	14%	20%
2016	1.383.473	1.412.683	6%	42%

Table 2: Reasons for evading payment of cheques.

The reason	2012	2013	2014	2015	2016
Insufficient balance	75%	56%	92%	90%	85%
The signature does not match	21%	44%	2%	1%	2%
A mistake in writing the check	1%	0%	1%	3%	7%
The account is closed	3%	0%	4%	5%	5%
The owner of the check died				1%	

This data shows the existence of the problem and the customers evade the obligation to pay the dues in a way that affects the activities of the company and its purpose of profit, which led us to continue the research objectives, which lies in the discovery of this problem through the extraction of data and make recommendations and guidance necessary for that. Based on the results and as attached to the table 2, which explains the reasons for customers evading the obligation to pay cheques. If we look at this table, we find that the highest percentage is evasion because of insufficient balance, which gives us the result that the customer has the intention not to pay the obligation and fraud and therefore not to put the value of the check in the bank to spend chase the fraudsters and record all the observations that help solve this problem and participate in decision-making with administrators and decision-makers.

These reasons are known after returning to the company from the bank, which in turn writes the reason for reference against the back of the cheques. As for the promissory notes, the company does not know the reason until follow the customer directly to find out why. According to the company's response to the question of the reasons for the return of the promissory notes. This means that the reason can only be determined when the customer is followed up and

ask him/her for the amount, and therefore the reason is added to the report that the employee makes for the managers and not to the accounting information system and its emergence when extracting data on the promissory notes. And therefore not to get a specific reason or clear except that he does not want to pay or want to postpone longer. Thus, the employee or accountant in charge of follow-up customers prepares full reports and sends them to senior management for decision making. Therefore, it is difficult to give a specific percentage on the reasons for evasion in the payment of promissory notes because there is a large amount of them.

According to information theory and the relationship of this theory research and its essence in the use of data and analysis to discover the problem and make decisions based on these data has already been extracted and analyzed and extracted results to discover the problem and take decisions as shown in the tables above. This data is capable of answering questions about the past (what has happened) by extracting and analyzing old data in order to benefit from them and take lessons from the previous results in decision-making. According to the data extracted from previous years help the company to learn from the previous mistakes that were the cause of this problem in the sale process and avoid falling again after study and analysis and know the reasons.

The present (what is happening) by extracting new data currently available and comparing it with old data and analyzing it, which further reduces errors and updates new decisions that increase the positive decision-making in order to minimize the problem as much as possible. In other words, additional measures follow the procedures taken from the analysis of past data.

And the future (what might happen) such as predicting a future event as a result of the existence of data that is constantly repeated by analyzing these available data. The use of the data available in this research helps to establish preventive measures and laws that help to reduce this problem significantly. It may not eliminate the problem permanently but limit it and help the company to continue its activities.

These data are all in accordance with the theory of the policeman, which was addressed in the second unit of the search, this system of accounting information used in the company will be the accountant of the company to include the full information on the sale process from the beginning until the problem and write all these observations and the necessary reports to make the necessary and important decisions By the administration to resolve this problem and to develop measures to reduce it. In

addition to this, first follow the clients in order to collect the obligations owed to them. That is, he does his work like a policeman who collects and writes all the information and chase the fraudsters and record all the observations that help solve this problem and participate in decision-making with administrators and decision-makers.

5 CONCLUSIONS AND RECOMENDATIONS

5.1 Conclusion

Our goal is to detect the evasion of promissory notes and cheques by customers, which is known as customer fraud in the Palestinian environment through the extraction of data through accounting information systems. Found that this company is facing this problem very significantly as a result of the data mining by a company that is work in Palestine, which is used by cheques and promissory notes very large and the negative thing is that this problem did not stop or decrease significantly but has been going on since Years so far. I find that there was a lot of indulgence by the company in the pre-sale process until after the evasion process in the procedures followed in the process of tracking fraudsters, but the positive thing is that the company began to develop and take measures to reduce the problem and therefore found that this research will It helps them develop in reducing them by helping to develop these procedures.

5.2 Recommendations and Suggestions

The recommendations from this study for future research include:

1. Based on the application form to open a new account used by the company to collect data about the customer before the sale, I find that this model lacks some things that would reduce the chances of falling into this problem, so I recommend the company need to work another model follows this model includes his bank statement To fully know that the customer is committed to pay cheques in general, which gives the company very important information enables them to agree to sell it or not. In addition, one or more persons will be brought as the guarantor of the customer, especially when buying through promissory notes, and the

- guarantor shall be liable in case of non-compliance by the customer.
2. I recommend banks to close the account of any person who does not commit to pay up to three cheques and to conduct a complete and detailed study of customers who want to open a bank account, which will help in the inability of scammers to have a cheques book and thus the inability to buy through cheques. And thus helps companies not to fall into the trap of these fraudsters and prevent them from falling into this problem.
 3. The government must impose strict laws against those who fail to commit themselves to paying the amounts due, forcing any person to fear the consequences before thinking about fraud from the bank and forcing him to commit to pay the value of cheques and promissory notes on time. Such as long prison terms or pay fines.
 4. I proposed the establishment of a huge information system between the banks operating in the country and the Association of Accountants and a committee of the government, where the idea to collect all data in this system includes all persons with bank accounts and therefore the company and before the approval of the sale back to this system through the Association of Accountants And the approval of the government committee to obtain this information, which makes the names of fraudsters in this system on the black list. Not only cheques, but all kinds of installment as the companies have many names of referrals who dealt with them through promissory notes and then can add their names to the black list in the system, which benefits all other companies that follow the system of sale installments. This significantly reduces the sale of fraudsters because the company has advance information about this person through this common system. Not only that, but companies can add information about all the customers who have bought from them whether they were fraudulent or committed to pay their dues.

REFERENCES

- Albashrawi, M. (2016). Detecting financial fraud using data mining techniques: A Decade Review from 2004 to 2015. *Journal of Data Science*, 14(3), 553-569.
- Brennan, P. (2012). *A comprehensive survey of methods for overcoming the class imbalance problem in fraud detection*. Institute of technology Blanchardstown Dublin, Ireland.
- Chakrabarti et al. (2006). *Data mining curriculum: A proposal (Version 1.0)*. Intensive Working Group of ACM SIGKDD Curriculum Committee, 140.
- Desai, B. and Deshmukh, R. (2013). Data mining techniques for fraud detection. *International Journal of Computer Science and Information Technologies (IJCSIT)*, 4(1), 1-4.
- Dzomira, S. (2015). Fraud prevention and detection research. *Journal of finance and Accounting*, 6.
- Eid, A. (2014). The impact of accounting information systems (ais) on performance measures with value relevance of auditors' communications. *Internal auditing and risk management*, 2(34), 143-158.
- Farrell, R. and Franco, R. (1999). The role of the auditor in the prevention and detection of business fraud: SAS No. 82. *Western Criminology Review*, 2(1), 1-12.
- Fayyad et al. (1996). *From data mining to knowledge discovery in databases*. AI magazine, 17(3), 37.
- Friendly, M. and Denis, J. (2001). *Milestones in the history of thematic cartography, statistical graphics, and data visualization*. URL <http://www.datavis.ca/milestones>, 32.
- Gerety, M. and Lehn, K. (1997). The causes and consequences of accounting fraud. *Managerial and Decision Economics*, 587-599.
- GOODE, S. and LACEY, D. (2011). Detecting complex account fraud in the enterprise: The role of technical and non-technical controls. *Decision Support Systems*, 50(4), 702-714.
- Ittonen, K. (2010). *A theoretical examination of the role of auditing and the relevance of audit reports*. University of Vaasa, Finland.
- Koornhof, C., & Du Plessis, D. (2000). Red flagging as an indicator of financial statement fraud: the perspective of investors and lenders. *Research Journal of the School of Accounting Sciences*, 8(1), 69-93.
- Kurt, T. (2004). *An Introduction to Data Mining*. doi:<http://www.theartline.com/text/dmwhite/dmwhite.htm>
- Miller, J. and Han, J. (2009). *Geographic data mining and knowledge discovery*. CRC Press.
- Nemati, R. and Barko, D. (2002). Enhancing enterprise decisions through organizational data mining. *Journal of computer information systems*, 42(4), 21-28. doi:10.1080/08874417.2002.11647049
- Palshikar, K. (2002). *A critical application for business intelligence*.
- RamaKalyani, K. and UmaDevi, D. (2012). Fraud detection of credit card payment system by genetic algorithm. *International Journal of Scientific & Engineering Research*, 3(7), 1-6.
- Salehi, M. (2011). Audit expectation gap: Concept, nature and trace. *African Journal of Business Management*, 5(21), 8376-8392.
- Sharma, A. and Panigrahi, K. (2013). *A review of financial accounting fraud detection based on data mining techniques*.

- Soltaniziba, S. and Balafar, A. (2015). The Study of Fraud Detection in Financial and Credit Institutions with Real Data. *Global Journal of Computer Science and Technology*, 15(6).
- Stolfo et al. (2000). *Cost-based modeling for fraud and intrusion detection: Results from the JAM project*. Paper presented at the DARPA information survivability conference and exposition, 2000. discex'00. proceedings.

