Chapter 11
Data Mining and Economic Crime Risk Management

Mieke Jans
Hasselt University, Belgium

Nadine Lybaert
Hasselt University, Belgium

Koen Vanhoof
Hasselt University, Belgium

ABSTRACT

Economic crime is a billion dollar business and is substantially present in our current society. Both researchers and practitioners have gone into this problem by looking for ways of fraud mitigation. Data mining is often called in this context. In this chapter, the application of data mining in the field of economic crime, or corporate fraud, is discussed. The classification external versus internal fraud is explained and the major types of fraud within these classifications will be given. Aside from explaining these classifications, some numbers and statistics are provided. After this thorough introduction into fraud, an academic literature review concerning data mining in combination with fraud is given, along with the current solutions for corporate fraud in business practice. At the end, a current state of data mining applications within the field of economic crime, both in the academic world and in business practice, is given.

INTRODUCTION

Fraud is a billion dollar business, as several research studies reveal. Among them are important surveys by the Association of Certified Fraud Examiners (ACFE, 2008) and PriceWaterhouse&Coopers (PwC, 2007). These reports demonstrate the magnitude of fraud that companies must deal with today. Economic crime, or corporate fraud, is generally speaking to be divided in internal fraud (fraud from within the company), and external fraud (fraud from outside targeting the company). At the Background section, a complete classification overview is provided, along with some fraud theories and some numbers.

At the same breath as fraud, data mining is often called, whether it is relevant or not. However, to link fraud to data mining, a lot of questions

DOI: 10.4018/978-1-61692-865-0.ch011

raise to the surface. About which kind of fraud are we talking? Is it internal or external fraud? Are all kinds of fraud to be linked with data mining? And if so, what data mining technique are we talking about? And equally important, what kind of data is used? And what is the purpose of the data mining? Is the aim to detect fraud, or to prevent fraud, or both? To have a clear overview of the current state of data mining in relation to economic crime, we look at all these aspects, to end with an unmistakable summary of current data mining applications for fraud mitigation. We refer to Jans, et al. (2009) as the original source of the following thoughts.

BACKGROUND

What is Economic Crime?

There are many definitions of fraud, depending on the point of view considering. According to The American Heritage Dictionary, (Third Edition), fraud is defined as "a deception deliberately practiced in order to secure unfair or unlawful gain" (p.722). We can conclude that fraud is deception. Whatever industry the fraud is situated in or whatever kind of fraud you visualize, deception is always the core of fraud.

In a nutshell, Davia, et al. (2000) summarize: "Fraud always involves one or more persons who, with intent, act secretly to deprive another of something of value, for their own enrichment". Also Wells (2005) stresses deception as the linchpin to fraud.

Corporate Fraud Classification

The most prominent classification in fraud is corporate versus non-corporate fraud. Corporate fraud is fraud in an organizational setting, whereas non-corporate fraud encompasses all remaining frauds. For instance, a citizen cheating with his income taxes is certainly fraud, but is no part of corporate fraud. Economic crime is equal to corporate fraud. Accordingly, an overview of corporate fraud classifications is given.

Within corporate fraud, the most important distinction is Bologna & Lindquist (1995)'s internal versus external fraud classification. This classification is based on whether the perpetrator is internal or external to the victim company. Frauds committed by vendors, suppliers or contractors are examples of external fraud, while an employee stealing from the company or a manager cooking the books are examples of internal fraud. What is seen as internal fraud, following this definition, is in fact the same as '*occupational fraud and abuse'*; the type of fraud the ACFE investigates in their Reports to the Nation.

In their 2008 Report to the Nation on Occupational Fraud and Abuse, the ACFE defines this type of economic crime as: "The use of one's occupation for personal enrichment through the deliberate misuse or misapplication of the employing organization's resources or assets" (ACFE, 2008). This definition encompasses a wide variety of conduct by executives, employees, managers, and principals of organizations. Violations can range from asset misappropriation, fraudulent statements and corruption over pilferage and petty theft, false overtime, using company property for personal benefit to payroll and sick time abuses (Wells, 2005). Although this type of fraud encompasses many kinds of irregularities, notice that it only covers internal corporate fraud. For example, fraud against the government (non-corporate fraud) and fraud perpetrated by customers (external corporate fraud) are not included. Since one has to be internal to a company and abuse its occupation to commit internal fraud, we put internal fraud and occupational fraud and abuse as equivalents. A combination of internal and external fraud can also occur, for example when an employee collaborates with a supplier to deprive the company. This is however categorized under occupational fraud and abuse as corruption.