

Recognize the many faces of fraud

Detect and prevent fraud by finding subtle patterns and associations in your data



Contents:

- 1 Introduction
 - 2 The many faces of fraud
 - 3 Detect healthcare fraud easily and efficiently
 - 3 Improve insurance fraud detection cost-effectively
 - 3 Stamp out occupational fraud
 - 4 Maximize tax revenues
 - 4 Fight fraud in the public sector
 - 4 Hang up on phone fraud
 - 4 Financial fraud
 - 5 Keep it clean with anti-money-laundering technology
 - 5 Shrinking shrinkage
 - 5 Take credit for fraud detection
 - 6 Conclusion and Notes
 - 7 About IBM Business Analytics
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Introduction

Fraud is big business. A global study of fraud in Australia, Canada, France, Germany, Ireland and the U.S.A. concluded that “The overall cost of fraud varied from £378 billion in the U.S.A. to £2.3 billion in Australia.”¹

In the U.K., it cost the economy £30.5 billion during 2008, with public sector losses (including tax fraud) accounting for £17.6 billion of the total².

Health care fraud is a serious issue, with global losses put at €180 billion (£160 billion or US\$260 billion) annually.³ In the U.S. alone, it is conservatively estimated at \$68 billion, but could be as high as \$226 billion annually.⁴

In the U.S., losses from occupational fraud (the use of an occupation for personal enrichment) were \$994 billion,⁵ while fraud accounts for about 10 percent of property and casualty insurance losses,⁶ worth some \$30 billion.⁷

In Canada, an estimated C\$500 million is paid for insurance claims containing elements of fraud,⁸ and in Australia the total value of fraud was A\$301.1 million.⁹

The range of fraud and the resourcefulness of fraudsters pose a daunting problem for those charged with its detection and prevention. Yet these criminal activities have one thing in common: each of them leaves a trail of behavioural and transactional data – insurance claims, mortgage or benefit applications, healthcare submissions, tax returns and so on – which are filed alongside information from legitimate interactions.



Fraud has many faces

Fraud can take place in almost any area of commerce or public sector service provision, and can be categorized as:

- Benefit/welfare fraud
- Financial services (plastic card/check) fraud
- Healthcare fraud
- Insurance fraud
- Retail fraud
- Credit fraud
- Customs fraud
- Tax fraud (evasion)
- Occupational fraud
- Identity theft, bribery, insider trading and money laundering are sometimes also classified as fraud.

“Fraud is difficult to measure ... which means some of the fraud loss figures ... only reflect fraud that has been reported. As a result, the fraud figure underestimates the total financial loss resulting from fraud.”

— National Fraud Authority: Annual fraud indicator. January 2010.

The many faces of fraud

Both private and public sector organizations can use that data to detect and prevent fraud by unleashing powerful IBM Business Analytics solutions that can detect and highlight suspicious transactions.

Whereas conventional analytical methods reveal what has happened in the past, predictive analytics can forecast what is likely to happen in the future. Conventional analytics can be used to detect fraud after it has happened, but IBM SPSS predictive analytics can detect it as it happens.

With the advanced statistical techniques incorporated in the software, organizations can detect subtle patterns and associations in their data, and use the results to build powerful predictive models that can identify anomalies. In contrast with rule-based detection, the models “learn” from the data. Therefore, they consider all the elements and significant relationships, and remain useful even as the data changes.

The models can incorporate data from both numeric (“structured”) and textual (“unstructured”) records such as emails, call center notes, agents’ reports and other sources. This results in more comprehensive and up-to-date models that are more capable of highlighting the cases most worth investigating. And unlike rules-based methods, they can detect new and emerging scams.

IBM SPSS predictive models are based on sophisticated statistical algorithms and your own business knowledge, and can be combined with existing fraud detection and prevention methods. Using a flexible, comprehensive set of techniques you can detect suspicious circumstances and react quickly to mitigate the impact of fraud. You can even identify possibly fraudulent transactions as they are happening by deploying detection models in real time systems.

IBM SPSS predictive analytics solutions are highly effective across a broad spectrum of fraud categories.

Detect healthcare fraud easily and efficiently

Across the world, fraudulent claims for medical treatment drain funds that should be available to provide care for those genuinely in need.

IBM SPSS solutions can help detect and prevent healthcare fraud by identifying elements of treatment that lie outside the “normal” range. Using techniques as clustering, association detection, and sequence detection, IBM SPSS solutions can detect one fraudulent claim among billions of legitimate cases.

Healthcare

Zorg en Zekerheid, an independent health insurer in the Netherlands, used IBM SPSS predictive analytics to accurately detect anomalies that indicate fraud, accelerating investigations from weeks to days.

Insurance

Infinity Property & Casualty Corporation of Birmingham, Alabama, insures drivers who have higher incidences of accidents and claims. Since implementing IBM SPSS predictive analytics, the company has had more success investigating fraudulent claims because it identifies suspicious claims and starts investigations earlier.

Improve insurance fraud detection cost effectively

IBM SPSS solutions help insurers to reduce claims fraud. They use a multi-stage process that repeatedly evaluates claims using the most up-to-date information, ensuring that settlement decisions take into account all available data. Because fraudulent claims are detected and referred at an early stage, investigators are able to follow up quickly.

Stamp out occupational fraud

Occupational fraud is widespread, affects both private and public organizations, and can take any one of a number of forms, including payments for services not rendered, payments to ineligible beneficiaries, intentionally incorrect submissions by a claim handler or independent financial advisor, or inflated estimates for repairs or maintenance work.

With IBM SPSS predictive analytics, any organization can identify a variety of payments that might result from fraud – or from administrative error or mismanagement.

Maximize tax revenues

IBM SPSS predictive analytics solutions have proved to be very effective at helping tax collection agencies to maximize revenues by detecting non-compliance more efficiently and by focusing investigations on cases that are likely to yield the biggest tax adjustments.

Compared with rule-based systems, predictive analytics can identify more subtle differences between tax returns. They also adapt readily to changes in tax laws, in the habits of non-taxpayers or in collection policies.

Fight fraud in the public sector

Local, regional and national government agencies in countries around the world use IBM SPSS software to uncover patterns that point to fraud, waste or abuse. In addition to supporting anti-fraud efforts in healthcare and tax collection, the software is particularly effective at discovering the tell-tale signs – often well concealed – of benefit frauds and customs scams.

Tax collection

The anti-fraud section of a southern European country implemented IBM SPSS predictive analytics technologies to significantly improve the speed, effectiveness and ease of fraud detection thanks to accurate, automated identification of high risk taxpayers.

By enabling agencies to clearly identify abnormal activities or behaviors, the software provides an early warning of imminent fraud and allows them to nip it in the bud.

Hang up on phone fraud

Addressing fraud is a challenge the telecommunications industry can face with confidence by using IBM SPSS predictive analytics solutions to easily detect and investigate possible frauds such as unauthorized use of another subscriber's minutes, billing fraud and fraudulent payments.

They can also use predictive analytics solutions to find optimal billing plans for subscribers who have poor credit ratings or are credit risks, reducing their risk while maximizing revenues.

Financial fraud

While the introduction of "Chip and PIN" cards ("smart cards," "chip cards" or "integrated circuit cards") and more stringent protection for e-commerce purchases has done much to reduce card fraud, losses from card, check and online banking fraud cost U.K. banks some £704.3 million in 2008.¹⁰

However, by scoring and ranking transactions with models built using IBM SPSS predictive analytics, banks can leverage their existing fraud detection methods and boost fraud detection rates dramatically.

Keep it clean with anti-money-laundering technology

Increasingly, financial institutions are required to help control money laundering – or face severe penalties.

IBM SPSS predictive analytics solutions offer sophisticated pattern recognition, anomaly detection, predictive modeling and risk analysis capabilities that can help them successfully detect attempts to launder money.

These solutions also can help detect terrorist financing, which differs in some respects from money laundering by criminal organizations.

Shrinking shrinkage

With IBM SPSS analytics solutions, retailers can build upon intuition and training to minimize shrinkage. Using anomaly detection and normal/deviant case modeling, retailers can build predictive models that can monitor transactions and staff behavior to identify the sources

Telecommunications

A leading developer of fraud detection and prevention software in the Middle East used IBM SPSS predictive analytics solutions to build a highly effective real-time fraud detection system for more than 150 telecommunications service providers worldwide.

Money laundering

A leading European bank uses IBM SPSS predictive analytics to detect money laundering, terrorist financing and fraud efficiently with minimal disruption to normal customer interactions.

of shrinkage before it becomes serious.

Take credit for fraud detection

Many applications for a mortgage or personal loan are made by fraudsters who have no intention of repaying the loan, and who will disappear shortly after the funds are released.

However, IBM SPSS solutions can effectively reduce losses from fraudulent loans by accurately detecting the subtle anomalies that lie within deceitful applications. Credit card issuers can also deploy predictive analytics to examine applications for credit cards. The technology can even be applied in real time so that suspicious loan applications are flagged immediately while genuine ones are not held up.

Credit

A leading bank in a Middle European country uses IBM SPSS solutions to assess customers' credit-worthiness accurately. Using predictive models, the bank has been able to increase overall loan capacity by 20 percent without increasing the level of risk.

Conclusion

IBM SPSS predictive analytics solutions allow both commercial organizations and government agencies to efficiently and reliably analyze the many variables related to fraud. Using a comprehensive but flexible set of techniques including risk scoring and anomaly detection, they can detect suspicious conditions and react quickly to nip the fraud in the bud – or mitigate the consequences.

IBM SPSS predictive analytics lets them focus investigative resources on the transactions that are most likely to be fraudulent, resulting in increased success rates and reduced costs.

Predictive analytics streamlines anomaly detection, enabling analysts to identify instances of unusual behaviour more quickly. And because the predictive models can be updated easily, organizations can continue to detect unusual situations even when fraudsters change their tactics.

Notes

- 1 NHS Counter Fraud and Security Management Service, *The International Fraud and Corruption Report*, July 2006.
- 2 National Fraud Authority, *Annual fraud indicator*. January 2010
- 3 MacIntyre Hudson LLP, *The financial cost of Healthcare fraud*. November 2009
- 4 www.nhcaa.org/eweb
- 5 Association of Certified Fraud Examiners, *2008 Report to the Nation on occupational fraud and abuse*.
- 6 www.iii.org/facts_statistics/fraud.html
- 7 www.theiia.org/intAuditor
- 8 <http://www.abc.ca/>
- 9 KPMG Fraud Survey 2008
- 10 National Fraud Authority, *Annual fraud indicator*. January 2010

About IBM Business Analytics

IBM Business Analytics software delivers complete, consistent and accurate information that decision-makers trust to improve business performance. A comprehensive portfolio of business intelligence, predictive analytics, financial performance and strategy management, and analytic applications provides clear, immediate and actionable insights into current performance and the ability to predict future outcomes. Combined with rich industry solutions, proven practices and professional services, organizations of every size can drive the highest productivity, confidently automate decisions and deliver better results.

As part of this portfolio, IBM SPSS Predictive Analytics software helps organizations predict future events and proactively act upon that insight to drive better business outcomes. Commercial, government and academic customers worldwide rely on IBM SPSS technology as a competitive advantage in attracting, retaining and growing customers, while reducing fraud and mitigating risk. By incorporating IBM SPSS software into their daily operations, organizations become predictive enterprises – able to direct and automate decisions to meet business goals and achieve measurable competitive advantage. For further information or to reach a representative visit www.ibm.com/spss.



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