

ASIS Spring Seminar 2006

Data Mining as a Fraud Prevention Tool

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16th March 2006

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Data Mining



3 key aspects:

- Prevention
- Detection
- Investigation

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Data Mining

- Before we start, let us consider why we work in the Security industry.
- Who or what are we trying to prevent and detect?

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First, know your enemy



- Who is this?

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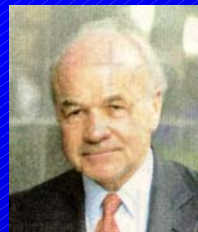
First, know your enemy



- Joti De-Laurey
- 35 year old mother
- Stole £4.5 million

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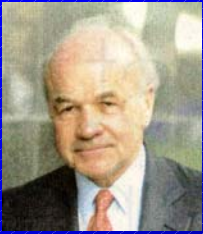
First, know your enemy



- Who is this?

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First, know your enemy



- Kenneth Lay
- Enron
- Enron's debts of £23 billion

First, know your enemy



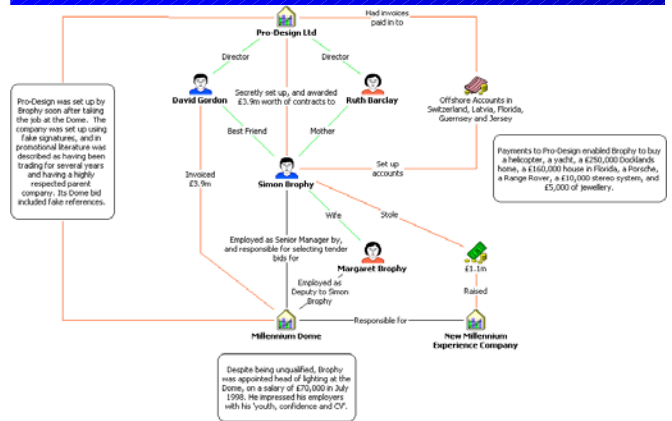
- Who is this?

First, know your enemy



- Simon Brophy
- Lighting Director Millennium Dome
- £4 million fraud
- Bogus CV

Company relationships



First, know your enemy



- Who is this?

First, know your enemy



- John Rusnak
- Allied Irish Bank
- Rogue trader
- Trading losses of £540 million

First, know your enemy



➤ Who is this?

First, know your enemy



- James Munroe
- £3 million Fraud
- Chief Accountant
- Mc-Graw Hill

First, know your enemy



➤ Who is this?

First, know your enemy



- Nick Leeson
- Rogue trader
- Barings Bank
- £800 million

Data Mining



Why do we
need data
mining to
detect fraud?

2005 Fraud barometer

- 72% of cases involve men
- Over half of internal fraud involves 2 – 5 employees
- 40% of frauds involve the finance department

Investigative Data Mining *2005 Fraud barometer*

- Only one in four cases were discovered by internal controls
- 31% of frauds were discovered following a whistle blower
- Weaknesses in controls were exploited by the fraudsters

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£14 Billion

£72 Billion

- the problem with fraud is that there are no reliable statistics
- Only a small percentage is reported

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Investigative Data Mining *How is Fraud Identified?*

Initial Detection of Occupational Frauds¹⁰

Detection Method	2004 (%)	2002 (%)
Tip	39.6%	43.0%
Internal Audit	25.8%	18.6%
By Accident	21.3%	18.8%
Internal Controls	18.4%	15.4%
External Audit	10.9%	11.5%
Notified by Police	0.9%	1.7%

Percent of Cases

Source : ACFE, Report to the Nation, 2004

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Investigative Data Mining *Why Use Data Mining to Detect Fraud?*

ANALYSIS OF THE MAIN PERPETRATORS OF CORPORATE FRAUD

Perpetrator Type	Percentage
single insider	30%
multiple insiders	49%
single external fraudster	11%
multiple external fraudsters	11%
collusion between internal and external	10%

- 49% Insiders
- 79% Includes element of collusion

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- UK Money Laundering Regulations date from 1993
- “it is also a separate offence under the ML regulations not to have systems and procedures in place to combat money laundering (regardless of whether or not money laundering is actually taking place).”

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Investigative Data Mining *Combating the financing of terrorism*

Data sharing tops UK banks' anti-fraud agenda

High Street Watch
By John Leventon
Published Friday 6th January 2006 13:45 GMT
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Data sharing and co-ordination top the agenda of UK banks in the fight against financial fraud, according to an exit poll at a recent financial crime conference. The survey - conducted by data integrity firm Datanomic after a conference organized by the British Bankers Association (BBA) - found data sharing was a key concern for banks this year, with 40 per cent of delegates listing it as a top concern.

The need for better data sharing came out ahead of ID fraud (30 per cent) and managing risk (15 per cent) in the survey. Perhaps surprisingly fraud prevention and detection were the top concern for only five per cent of delegates polled.

Three-quarters of bankers polled said that recent terrorist actions had made thorough matching of customer data against sanctions lists more important to their business. Despite this nearly half of those polled (40 per cent) admitted that they do not have an automated solution in place for sanctions matching.

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Think outside the box

- Trusted employees know the systems
- Trusted employees commit fraud or steal information
- Effective fraud detection systems need to be unexpected and innovative

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Know Your Customer

- It is not only vital to KYC, but
- Who are your employees?



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Know your employee

- Implementing a balanced, considered mechanism to ensure that an organisation minimises employee fraud contains many elements, data mining can be part of that

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Data Mining Employee information

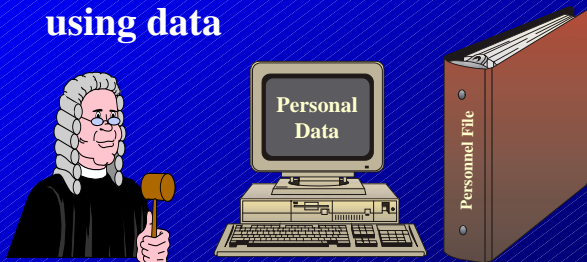


- Conflicts of interest audits
- External reference data
- Expenses, corporate credit card spend

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Perceived barriers

- Review legislation, data protection and privacy in using data



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Walking a tightrope

- Plan to use data mining
- Register the purpose
- DP Adverse Impact Assessment
- Run fraud workshops and gain employee understanding
- Include a new clause in employment contracts
- Use staff handbooks

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DPA Registration

- Can often be done online
- Is not a barrier to data mining, but
 - Needs legal advice as each EU member state has interpreted the Data Protection Directive in its own way

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Perceived barriers



HR may object to the use of personnel data because:


- Employment contracts are inadequate
- They don't understand

Human Resources

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Perceived barriers



Data mining seen as an erosion of their responsibilities

IT "own" data

Use of non standard, therefore not approved, software


IT Department

Not a priority

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External Reference Data



- Internet sources
- Download for free
- Different formats
- May not be valid

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Insolvency Register



<http://www.insolvency.gov.uk/bankruptcy/bankruptcysearch.htm>

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Insolvency Register

Individual Insolvency Register

Search Results

Trading name starting with **A**
Searching across ALL courts in England and Wales

Your search returned 1145 records.
Click on the **Surname** to see the Individual Insolvency Register Report

Forename	Surname	Date Of Birth	Trading Name	Court	Number	Start Date	Type
ANGELO	THEMISTOCLEOUS		A & A AUTOS	HIGH	0006672	05/09/1996	Bankr.
ARTHUR JAMES	COOPER	04/04/1944	A & A BUILDERS	CROY	0000946	14/01/2003	Bankr.
ALFRED	FREEMAN	01/05/1947	A & A SNACKS CATERER	DE	0000002	05/02/2006	Bankr.
DARRY WILLIAM	SHAW	10/04/1992	A & D FRUITERS	HAST	0000222	14/09/1992	Bankr.
MYRTLE ANN	SHAW	31/01/1942	A & B FRUITERS	HAST	0000222	14/09/1992	Bankr.
BARRY WILLIAM	SHAW	10/04/1992	A & B FRUITERS AND SUSSEX FRUITERS	HAST	0000222	14/09/1992	Bankr.
MYRTLE ANN	SHAW	31/01/1942	A & B FRUITERS AND SUSSEX FRUITERS	HAST	0000222	14/09/1992	Bankr.
BRNWICK	SEAFORTH-BROWN	09/12/1968	A & B HEATING SERVICES	HIGH	0001389	01/06/1998	Bankr.
ALFRED	BALL	10/07/1957	A & B SURFACING	SLOU	0000229	24/08/2005	Bankr.
DEBRA LEE	MAHON	07/05/1954	A & D NURSING AGENCY	CHEG	0000006	05/06/2005	Bankr.

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Investigative Data Mining Prohibited Individuals

Financial Services Authority Register

Home

FSA Register
Firm Search
Interim Authorised
Individuals Search
CIS Search
EPF Register

Exchanges
E-Money
E-Commerce
Proh. Indiv. List
Disqualification
Disapplication
Certified Publications

Prohibited Individuals search

You can find out if an individual is banned by entering the NI number below and then click on the Search button.

NI Number:

Name	Also Known As
AIKEN, MICHAEL CHRISTOPHER	
Aiken, Michael Joseph	
Alloop, Kevin	
BERRY, KEVAN IAN	
BUTTFORTH, STEPHEN MARTIN	
Bazreto, Larry John	
Bingham, Paul	
Blunden, Antony	
Bolton, Warren Michael	Warren Bolton
Bratt, Michael Iain	Michael Greenwood Michael Lynch

http://www.fsa.gov.uk/register-res/html/prof_proh_indiv_fram.html

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Investigative Data Mining Disqualified Directors

Companies House

Home Text only Bookmark site Links

Search this website Enter keywords

Info and guidance on

Please select Please select

Disqualified Directors Register

To obtain further details click on the appropriate Director
Information correct to 04/02/2006

Name	Post Town	Region Code
AARONS, PAUL MICHAEL	ESSEX	RM6 5UA
AARONSON, ADAM	LONDON	SW10 9AF
ABBASI, ASSAD	GTR MANCHESTER	M13 2LN
ABBASI, JOSEF ADAM AKA YOUSEF KHOTIFABASSI & JOSEPH ABBASI	SURREY	SM7 3EY
ABBASI, JOSEPH ADAM AKA YOUSEF KHOTIFABASSI/JOSEF ABBASI	SURREY	SM7 3EY
ABBASI, KEVIN TARIQ	BRADFORD	BD5 9MT
ABBASI, CHRISTOPHER A BERT	HERTFORDSHIRE	SG13 0JA

<http://www.companieshouse.co.uk/ddir/>

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Investigative Data Mining Fraud profiles

- Key red flags
 - Duplicate data
 - Inaccurate and misleading information
 - Unusual relationships
 - Unusual or contrived transactions

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Investigative Data Mining Fraud profiles

IDM D.A.T.A. Solutions Automated Fraud Detection Module

Supplier Profile Detail Reporting

Supplier Number: Total Invoiced:

Supplier Name: Fraud Score: Print

Test Series	Score	Reason
Duplicates	9.0	Duplicate Bank Tel No
Accommodation	3.0	Match with Prison Postcode
Telephone	9.0	Telephone STD is a mobile STD number
Bank	9.0	Supplier's bank is offshore but Supplier is not
Postcode	0.0	
Sector	3.0	Matches with sector risk key words in the supplier name
VAT Number	9.0	VAT Number is invalid
Personnel	0.0	
Location	0.0	
PO Box	3.0	Match with PO Box, Suite, Flat or C/O

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Investigative Data Mining Benchmarking

Risk Exposure (Static Profiles) - VAT tests on

The number of suppliers in each risk category expressed as a percentage of all suppliers

Risk Category	Percentage
>= 9 (High Risk)	1%
> 3 and < 9 (Medium Risk)	3%
<= 3 (Low Risk)	22%
No Score	74%

Case Study plc

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Investigative Data Mining Comparisons

Company 1 - Risk Exposure

The number of suppliers in each risk category expressed as a percentage of all suppliers

Company 1

Company 3 - Risk Exposure (Static Profiles) - VAT test on

Company 3

Company 2 - Risk Exposure (Static Profiles) - VAT test on

Company 2

Company 4 - Risk Exposure (Static Profiles) - VAT test on

Company 4

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Past Example (1)

Internal focus

- 1,500 unverifiable supplier addresses, £300 million spend in three years
- 1,000 suppliers with no bank details
- 1,500 suppliers with no VAT numbers

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Past Examples (2)

Publishing company

- \$1.0 million advance paid into suspense account
- subsequently transferred to Luxembourg
- employee responsible for transfers “didn’t come back from holiday”

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Past Examples (3)

Printing company

- different addresses and post codes
- different telephone numbers
- same fax number
- printers had over charged and withheld rebates
- Contract renegotiated, £1,000,000 recovered

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Past Examples (4)

Maintenance group

- 3 companies linked by common addresses
- 2 non trading
- heading for liquidation
- contracts in excess of £360,000 awarded in 1 year

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Past Examples (5)

Venture capital

- out sourced IT
- collusive relationship between supplier and employee
- by passed central purchasing
- billed in excess of £150,000

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Past Example (6)

Facilities payment (bribe)

- Single round value £70,000
- Company in Malta
- No record of organisation or person in Google, research etc.
- Invoice was for consultancy in West Africa
- No supporting documents

Past Example (7)

Art gallery donation

- round value £20,000
- six months in advance of art exhibition
- exhibition cancelled, money never returned
- art gallery was under major refurbishment

Past Examples (8)

- 20 sequential invoices
- average invoice value of about £3,500
- hand-written invoices
- started mid year, no prior trading history
- no one accepted responsibility

Past Examples (9)

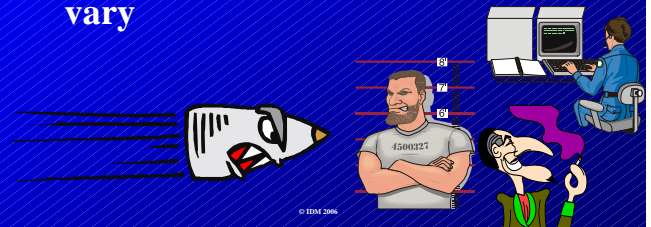
Multiple applications to a Charity

- same charity different locations
- different charity same locations
- collusion between charity and applicants
- use of accommodation addresses

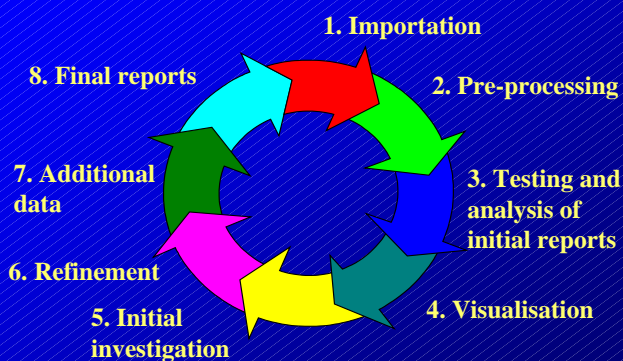


Practical Considerations

- There is no magic bullet to identify all fraud
- Frauds, and consequently profiles, vary



Data Mining- in practice



Case Study One: FSA Compliance

- Mutual Insurance company
- Authorised by FSA
- Electronic payment verification
- Spot problems before they happened

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Case Study One

- Perform daily verification
- Satisfy bank in USA that controls are in place
- Create blacklists and whitelists
- Satisfy FSA that money laundering processes are in place
- Prevent problems

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Internet Blacklists

- Bank of England Sanctions List
- OFAC Specially Designated Names List
- World Bank Debarred List
- Companies House Disqualified Directors List

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Blacklists: Bank of England

BANK OF ENGLAND SANCTIONS LIST

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Blacklists: OFAC

OFAC SDN LIST

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Blacklists: World Bank

Procurement

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Transaction Monitoring

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Conclusion

- **Data Mining is a very productive and valuable tool**
- **It can be used proactively and reactively depending on circumstances**

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