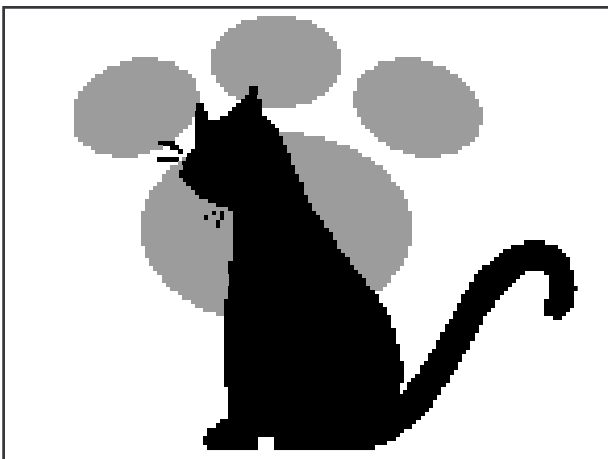


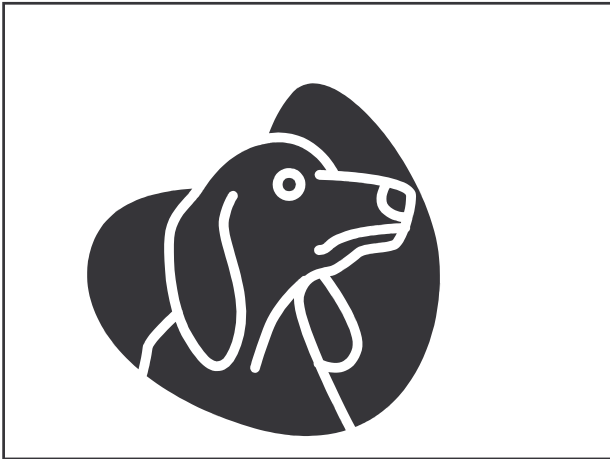
Introducing Computer – Assisted Audit Techniques

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Risk Management Adviser
The Highways Agency, UK

Introducing Ray...

- Almost 30 years in IS audit in H M Customs & Excise
- Used CAATs since they were called file interrogation
- Mainframe through to PC
- Now moved to Highways Agency as Risk management Adviser
- Past President ISACA Northern England





Introducing the session

- Level – BASIC
 - *If you've used CAATs this may not be for you*
- No Demos
- Assumptions.....
 - You Understand Concepts of
 - Data organisation
 - Audit
 - Control

Agenda

- Breeds of CAATs
- Capabilities & Limitations
- What you can achieve
- An illustration
- Sampling
- Latest Developments
- When to use CAATs
- Successful Auditing with CAATs

Breeds of CAATs..

- Test Data
- Embedded Audit Routines
- Integrated Test Facilities
- Trace Utilities
- Utilities / Report Generators
- Generalised Audit Software

Test Data

- Confirms operation of system...
- ...For all conditions you can imagine..
- BUT
 - Have you got resources to assemble a comprehensive set of test data?
 - What about the conditions you can't imagine ?
 - Are you using a Test system ?
 - Is it the same as production ?
 - Can you mix test & Live data ?
- Use with caution

Embedded Audit Routines

- Again, can only test for conditions you can imagine
 - Need to be in at design stage
 - Same constraints as system itself
- If you need to monitor a system in this way, consider continuous audit

Integrated Test Facilities

- Dummy Department or Branch
- Process transactions – Confirm correctness
- Must ensure
 - Data doesn't touch "Live" accounts data
 - Processing is IDENTICAL to production

Trace Utilities

- Work on the Software, not the Data
- Require access to Source code
- Map possible processing paths
 - What might happen, not what HAS happened
 - Need to monitor changes in system

Utilities / Report Generators

- On the system already, no new cost
- Can be run any time – Without Auditor
- Data is accessible and (Probably) described to the software already
- Needs expertise in the generator
- May impact system resources / performance
- Work on live data – Beware of corrupting it!

Generalised Audit Software

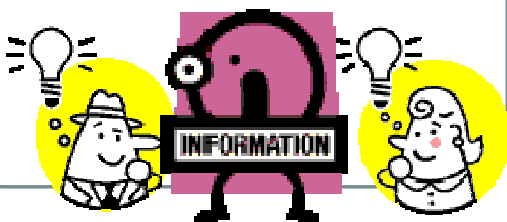
- Can do ANYTHING with data
- Many built-in functions
- (Mostly) works on copy data
- PC or Host based
 - ACL, IDEA
 - Filetab
 - Panaudit
- Useful for data analysis as well as testing

Capabilities and limitations

- Capabilities
 - Summarize
 - Sort
 - Match
 - Recalculate
 - Report exceptions
 - Anything you can imagine doing with data...

Capabilities and limitations

- Limitations
 - What's in the Data
 - Your imagination



What you can achieve

- Audit Theory – the 3 “A”s
 - Completeness (**A**ll there)
 - **A**ccuracy
 - **A**uthorisation
- Compliance Tests
- Substantive Tests

Completeness

- Re-total data
- Summarise on dates
 - Compare with postings
- Summarise on Status
 - Any suspense items ?
- Summarise on Source
 - All reported ?
- Look for Value fluctuations
- Gaps checks

Accuracy

- Exception Reporting
 - Test / repeat validations
 - Test / Repeat calculations
 - Look for large items
 - Look for odd conditions
 - Keyword searching
- Matching
- Parallel Simulation

Authorisation

- Sampling (both Statistical and judgment sampling),
- Duplication checks
- Matching standing data
- Date checks – Future? Past?

Compliance & Substantive Tests

- Compliance
 - Any control failures ?
- Substantive
 - How Much / How many...
- A CAATs Based Compliance test can be a substantive test as well...

A Purchase Ledger Example

*Purchase
Ledger
Transactions*

- Supplier Account No
- Invoice No
- Invoice Date
- Accounting Period
- G/L Account
- Cost Centre
- Currency
- Net Value
- Tax Value
- Posting Status
- Posting date

Completeness : Sum Values

- Grand Totals...
- Period Totals by...
 - G/L Account
 - Cost Centre
 - Posting Status
 - Supplier A/C
- Compare to key internal records
- Is everything there ?
- Do the totals look reasonable ?

Accuracy

- 20 (or so) largest items
 - Are they all OK ?
 - These may represent >50 % of value

Accuracy

- **Reasonableness - Confirming a control**
- System is said to warn when tax is outside range (Net Value * 17.5%) ± €5
- Is the control working ? Is €5 tolerance appropriate?
 - Calculate Net Value * (normal VAT Rate)
 - If Calculated VAT Not = Tax Value,
 - Subtract Calculated VAT from Tax Value
 - Report item IF difference > or < (YOUR Tolerance figure)

Authorisation

- Duplicate Entries
 - Key on supplier account No + invoice date + net value
 - Overcomes forcing - System can't tell Invoice a1234 is same as A1234
- Date checks
 - Report if Invoice Date > today
 - Invoice may not be paid or posted until due date..
- Correct attribution to Account / Cost centre
 - May need sampling – Later.....

So Far....

- Just looked at “raw” transactions
- No details....
- So let's add some

Add Supplier Details..

Purchase
Ledger
Transactions

Supplier
Details

- Supplier Account No
- Name
- Address
- Postal Code
- Country Code
- Telephone No.
- Bank Code
- Bank Account
- Tax Registration No

Match on Key Fields

- | Purchase Transactions | Supplier Details |
|-----------------------|-----------------------|
| ● Supplier Account No | ● Supplier Account No |
| ● Invoice No | ● Name |
| ● Invoice Date | ● Address |
| ● Accounting Period | ● Postal Code |
| ● G/L Account | ● Country Code |
| ● Cost Centre | ● Telephone No. |
| ● Currency | ● Bank Code |
| ● Net Value | ● Bank Account |
| ● Tax Value | ● Tax Registration No |
| ● Posting Status | |
| ● Posting date | |

Adding Supplier Detail

- Tidy up reports
 - "ISACA, Chicago" means more than "Account 12345"
- Summarize transactions on ...
 - Bank Account Codes
 - Postal Codes
 - Country Codes
 - Telephone Area Code

Add Payroll Details..

Purchase Ledger Transactions

Supplier Details

Payroll Data

- Employee No
- Name
- Address
- Postal Code
- Country Code
- Telephone No.
- Bank Code
- Bank Account

Match on Key Fields

• Purchase Transactions

- Supplier Account No
- Invoice No
- Invoice Date
- Accounting Period
- G/L Account
- Cost Centre
- Currency
- Net Value
- Tax Value
- Posting Status
- Posting date

• Supplier Details

- Supplier Account No
- Name
- Address
- Postal Code
- Country Code
- Telephone No.
- Bank Code
- Bank Account
- Tax Registration No

??

Payroll Data

- Employee No
- Name
- Address
- Postal Code
- Country Code
- Telephone No.
- Bank Code
- Bank Account

Matching and Internal Fraud

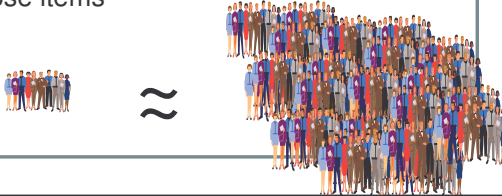
- **Are any of your suppliers employees?**
- Can you match Suppliers' and Employees'..
 - Bank details
 - Telephone numbers
 - Postal codes / addresses ?

Sampling with CAATs

- Judgement Sampling
 - Tells you condition occurs
 - Ten biggest
 - First ten
 - Doesn't give incidence or impact

Statistical Sampling

- A Scientific method of estimating the value or other characteristics of a large number of items from the examination of a small sample drawn at random from those items



Statistical Sampling

- A Scientific method of estimating the value or other characteristics of a large number of items from the examination of a small sample drawn at random from those items

Works because a small sample is provably representative of the whole population, within known limits

Statistical Sampling

● Tests the parts other CAATs can't reach

● Can give you :

- A Scientific Estimate
- The limits within which your estimate is reliable
- The ratio of assurance to resources
- Scientific backing to Best Judgment

● Cannot give you :

- An Exact Answer
- An Easy Answer
- A Quick Answer

Statistical Sampling

- **Techniques & their Uses :**
- **Attribute Sampling -**
Proportion of a population
- **Variable Sampling -**
Value of a population
- **Monetary Unit Sampling -**
Maximum possible error value

Statistical Sampling

- **Successful Statistical Sampling..**
- Can't use other CAATs
- Homogenous population
- Known population
- Known objectives
- Planning

Latest Developments

- **Continuous Audit**
 - Definition
 - Applications
 - Tools available
- XML / XBRL as a data source
- Web logs as a data source
- Digital Analysis

Continuous Audit Definition

A type of auditing which produces audit results simultaneously with, or a short period of time after, the occurrence of relevant events

Alles, M.G., Kogan, A & Vasarhelyi, M. A. Feasibility and Economics of Continuous Assurance, Proceedings of the Third World Continuous Auditing and Reporting Symposium April 2001, Rutgers University, USA

Applying Continuous Audit

- Anything needing real-time monitoring
 - Account transactions
 - Tax Treatments
 - Account Balances
 - Special transaction types
 - "Black Box" monitoring of transactions
 - Web / firewall logs

Continuous Audit Tools

- Examples
 - ACL
 - Ernst & Young CARS
 - Audicon Tool
- What's Audited / Monitored ?
 - Web transactions (logs again)
 - ERP systems

XML / XBRL as a data source

- XML / XBRL carry definitions with data
- ACL / IDEA can read direct
- No Data Structure issues

Web logs as a data source

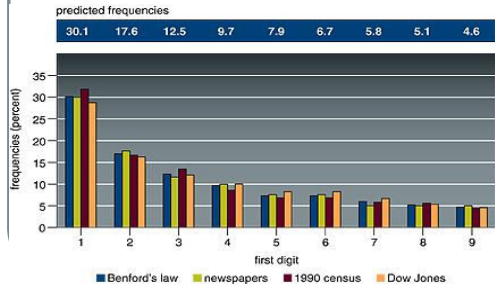
- Data plain text
- Uses :
 - Are all web orders captured in accounts ?
 - What web transactions fail ?
 - Security Issues...

Digital analysis

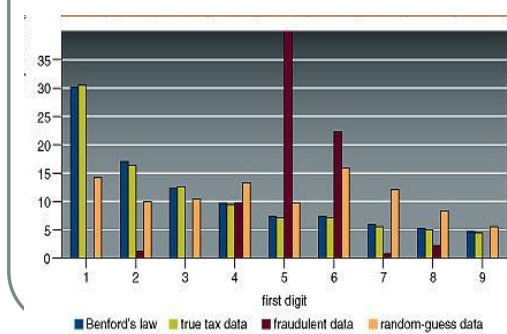
- Data Mining
 - An information extraction activity whose goal is to discover hidden facts contained in databases.
 - machine learning,
 - statistical analysis,
 - modelling techniques and
 - database technology,
 - finds patterns and relationships in data
 - infers rules that allow the prediction of future results.

Digital analysis

Benford's Law



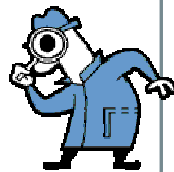
(From "The First-Digit Phenomenon" by T. P. Hill, *American Scientist*, July-August 1998)



(From "The First-Digit Phenomenon" by T. P. Hill, *American Scientist*, July-August 1998)

When to use CAATs

- You want to test a control
 - Re-Perform independently
 - Prove it Works..
 - ..Or prove it doesn't



When to use CAATs

- A possible weakness
- Either
 - “so-and so MIGHT happen, please change your system to prevent it”
- OR
 - “so-and so HAS happened, Here’s what it’s cost you so far, please change your system to stop it happening again”



Successful Auditing with CAATs

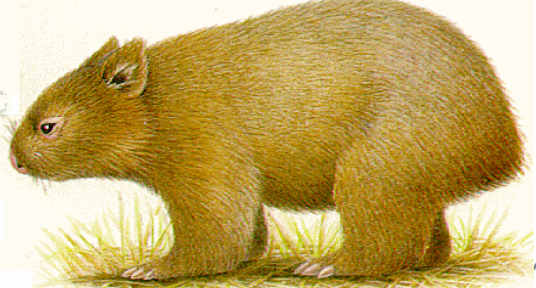
- What are you trying to Achieve ?
- What tool is best –
 - Balance between –
 - Control
 - Power
 - Convenience
 - Impact on auditee
 - Independence

Successful Auditing with CAATs

- First catch your file
 - Do you understand the Data ?
 - Have you got everything ?
 - What’s between you and the REAL data ?
 - Reconcile – Control totals
 - Summarise on important fields
 - Do you need supporting tables ?

Successful Auditing with CAATs

(CAATs – plan) = **WOMBAT**



Waste of Money, Brains and Time

CAATs Tools available...

- Including some you may already have
 - ODBC links & MS Query
 - Report files – Monarch / DataImport
 - Downloads
 - MS-Office products
 - Report generators
 - ACL / IDEA
 - Panaudit / Easytrieve
 - Filetab

Where to find out more

- K-net at www.isaca.org
- Vendor Sites
 - ACL www.acl.com
 - IDEA www.casewareidea.com
 - Filetab www.ncc.co.uk/software
 - Panaudit & Easytrieve Plus www.ca.com
- Many articles in *IS Control Journal*
- Many good books in ISACA bookstore

Where to find out more

- *Auditnet* www.auditnet.org
- www.continuousaudit.org
- Data Mining & Benfords – Google search

Conclusions

- No Answers- just smart questions..
- 100% tests now quicker and easier than ever before...
- BUT Proper planning and understanding essential
- CAATs Yes ! WOMBATs No !

Any Questions.....



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