An Introduction to AI in Financial Statement Audits

Adam Massia, CPA, CA

AGENDA

1. Today's audit landscape
2. AI powered risk scoring
3. Roadmap towards AI
Today’s Audit Landscape

Common Trends

1. Fee pressure from audit committees
   - Shift to advisory services to improve margins

2. Large audit failures leading to increased scrutiny of the profession

3. Retention of key talent
FRC Audit Inspections

90% of audits require no more than limited improvements

Target for 2020/2021 set for 100%

75% (2017/18 - 73%) of FTSE 350 audits required no more than limited improvements

27 financial sanctions imposed to £42.9m (2017-2018 – 11, £15.5m)
Non-financial sanctions increased to 38 (2017-2018 – 11)

CPA Ontario Practice Inspection

RESULTS OF INSPECTIONS

2016: 87%
2017: 91%
2018: 89%

No further action or action plan response
Reinspection
Referral to the Professional Conduct Committee
CPAB Audit Inspections

Annual Firms 2016-2018 Inspections Results

2018
49
34
39
2017
53
15
60
2016
32
24
79

* # Files with Significant Findings
** # Files with Other Findings
# Files with No Findings

CPA Ontario – Inspection Observations

Auditing
Revenue

Audit Sampling

Substantive
Analytics

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Financial loss: Known vs. unknown

What we see & know:

~$200B financial loss annually

Actual financial loss:

~$4T annually
due to human error or intent, and growing

To place this estimate in context, if the 5% loss estimate were applied to the 2017 estimated Gross World Product of USD 79.6 trillion, it would result in a projected total global fraud loss of nearly USD 4 trillion.

Source: Association of Certified Fraud Examiners Report to Nations
Current tools and methodologies are ineffective

- 40% Fraud caught by mistakes and tips
- 3% Fraud caught by analytics
- 16 Months to detect fraud
- 80% Surge in fraud incidents the last 10 years

Source: Association of Certified Fraud Examiners, Institute of Internal Auditors

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The 3Vs of Big Data

“*The phrase ‘big data’ is often used in enterprise settings to describe large amounts of data. It does not refer to a specific amount of data, but rather describes a dataset that cannot be stored or processed using traditional database software.*”
“You can’t manage what you can’t measure.”

How AI is transforming audit

Traditional audit is rules-based, with limited coverage:

- e.g., integrity tests, fraud framework, standard fraud analytics, etc.
- Domain Expertise & Business Rules
- Statistical Methods
- e.g. Benford’s Law, regression, 3-digit testing, etc.

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How AI is transforming audit

AI is learning-based, with 100% coverage

**Ensemble AI**

- Linking analysis and connecting it all together in an explainable way.

**Machine Learning**

- e.g. Human intelligence scoring, SOS, rarity, outlier detection, reinforced learning, etc.

**Domain Expertise & Business Rules**

- e.g., integrity tests, fraud framework, standard fraud analytics, etc.

**Statistical Methods**

- e.g. Benford’s Law, regression, 3-digit testing, etc.

**Supervised learning**

- Human expert feeds the computer with training data. From that data the computer should learn the pattern.

**Unsupervised learning**

- No expert input, the computer identifies pattern in data and looks for outliers. Particularly useful where the human expert doesn’t know what to look for.

**Reinforced learning**

- Reinforced learning algorithm continuously learns from the environment in an iterative fashion.

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**Machine Learning**

“Machine learning is a field of computer science that often uses statistical techniques to give computer systems the ability to “learn” with data, without being explicitly programmed.”

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**Clustering**

Clustering is a machine learning technique to group a set of objects, such that each of those objects in the group is more similar than those in other groups.

Using general ledger data, clusters can be based on:
- Dollar amount of the monetary flow
- Source and destination of the monetary flow
- Number of flows that occur alongside this flow
- The proximity of this flow’s transaction to the end of the month (time)

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**The crucial role data plays for auditors & advisors**

- **AI detection**
  - Finding the needle in a haystack

- **Predictive modeling**
  - Forecasting expected values or ranges

- **Data visualization**
  - Making complex information digestible
Borrow from auditing procedures

- Assess risks at financial statement level
  ([CAS 240 para. 25])
- Test journal entries and other adjustments
  ([CAS 240 para. 32(a)])
- Evaluate business rationale for transactions outside normal course of business
  ([CAS 240 para. 32(c)])
- Evaluate whether analytical procedures performed at the end of the audit indicate a risk of fraud
  ([CAS 240 para. 34])

Characteristics of potentially inappropriate journal entries

- made to unrelated, unusual (e.g., unusual combinations of debits and credits), or seldom-used accounts
- made by individuals who typically do not make journal entries and other adjustments
- recorded at the end of the period or as post-closing entries that have little or no explanation or description
- made either before or during the preparation of the financial statements but that do not have account numbers
- containing round numbers or consistent ending numbers
- recorded and approved by the same person, or not approved
- recorded at an unusual time for the entity
- outside of the normal course of business
- dated outside of the regular recording period, for example, beyond the number of days included in the client’s standard closing process, or
  - applied to accounts that:
    — contain transactions that are complex or unusual in nature
    — contain significant estimates and period-end adjustments

Rules based view of audit procedures (Legacy CAATs)

A legacy but still common practice encourages the use of audit testing tools where each test is done one-by-one. Each test is performed in isolation and then examined by the auditor to look for issues.

This focuses the auditor on specific issues and helps to verify the presence of controls and good accounting practices.

These techniques increase the odds of finding anomalies; however, this can be improved.
**Rules based tests**

Typical Audit Test Pattern: Tests performed 1 by 1 and human auditor inspects results

- Weekend Post
- Manual Entry
- High Dollar Value

**Human Hypothesis Generation**

What can I say about these transactions? What else is interesting?

A Human Centric View of Analysis
Rules Based Testing: Combinations

- Each test has historically been independent of others.
- Combining tests is more likely to indicate higher risk and more anomalous conditions

Common sense view

“What is the likelihood that a weekend post, which is also a high dollar value manual entry, suspicious and interesting?”

Example Distribution of ‘Last 3 Digits’

On the right is a visualization of a test result for transactions which fail and pass the “Last 3 Digits” test in a 10,000 transaction journal.

Transactions which end ‘0.00’ or ‘9.99’ fail the test. A risk score of 10000 indicates they failed the test and 0 if they pass.

The data is ordered by highest score to lowest. In this case you can see over 30% of the journal entries fail this test.

High false positive rate.

This explanation is required to understand future visualizations of risk factors.
Rule based testing: Combinations

By considering all tests together and viewing a combined result score you can see higher risks floating to the top which fail more tests.

Conclusion: Combining the test outcomes and understanding the intersect produces better results when trying to understand transaction risk.

Quick comparison of machine learning vs. rules

In an example scenario “Unusual Cash Disbursements”:
- Rules: flagged a transaction as normal putting it in the 30th percentile of risk
- Machine Learning: flagged the same transaction in the 3rd percentile of risk

Conclusion: Machine Learning is proving a better tool to understand risk factors and it produces better outcomes than rules-based approaches alone.
Roadmap towards AI

AI is a cultural change

To scale up AI, companies must make 3 shifts:

• From siloed work to interdisciplinary collaboration
• From experience-based, leader-driven decision making to data-driven decision making at the front line
• From rigid and risk-averse to agile, experimental, and adaptable

Adapting AI to your business

“Building the AI-Powered Organization”
August 2019
AI adoption journey

Phase 1: Explore & engage

6 – 8 weeks

Phase 2: Enable & expand

Phase 3: Embed & empower

Phase 4: Evolve

AI education
Understand the benefits of an AI analysis of financial data

Build data competency
Understand client data requirements

Identify AI champion
Phase 1: AI education

- Understand the benefits AI brings to the analysis of financial data
- Read about AI, visit AI focused conferences, attend webinars and workshops covering the topics of AI, machine learning and big data
- Look for CPD credits beyond traditional audit courses

Phase 1: Build data competency

- Need to apply skepticism to validate the data received
  - Am I analyzing a complete set of data?
  - Can I rely on the data provided to make decisions?

- Understand sources and structure of data provided
  - Does it require cleansing?
  - Is it structured or unstructured data?
  - What key information can be used for analytics?
Phase 2: Enable & expand

INFORMING CLIENT
Preparing for a comprehensive, risk-based audit

PREPARING STAFF
Structuring an AI-based audit

- Explain the value of extracting more data than traditionally requested
- Provide materials or resources to help with data, if necessary
- Articulate revised timelines or expected changes using data-driven approach
Phase 2: Enable & expand

Provide clear guidance for desired use:

- Gain in-depth understanding of client operations using trended and predictive analytics
- Assess transactional risk to improve procedures designed for risk response
- What sources of audit evidence exist that need to be documented?

PREPARING STAFF

Structuring an AI-based audit

Phase 3 and 4: Integrating AI into your practice

Combine internal skillsets for a collaborative approach to adoption:

Product experts  CPA resources  Change management

Get support with technical readiness, audit methodology, and change management.
Takeaways

1. Current approaches to audit are outdated and need to conform to meet the today’s business environment.

2. An AI system can take on many of the tedious tasks of an audit (data processing, risk scoring, searching, filtering etc.), with the human auditor focusing on the tasks too complex for an AI (taking decisions, communicating results to clients, advising etc.)

3. Adopting an AI powered tool is a journey, start small and expand use of AI as you and your team become AI confident.