



An Introduction to AI in Financial Statement Audits

Adam Massia, CPA, CA

© Copyright 2019, MindBridge Analytics Inc.

AGENDA

- 1 Today's audit landscape
- 2 AI powered risk scoring
- 3 Roadmap towards AI



© Copyright 2019, MindBridge Analytics Inc.



Today's Audit Landscape

Common Trends



Fee pressure from audit committees

Shift to advisory services to improve margins

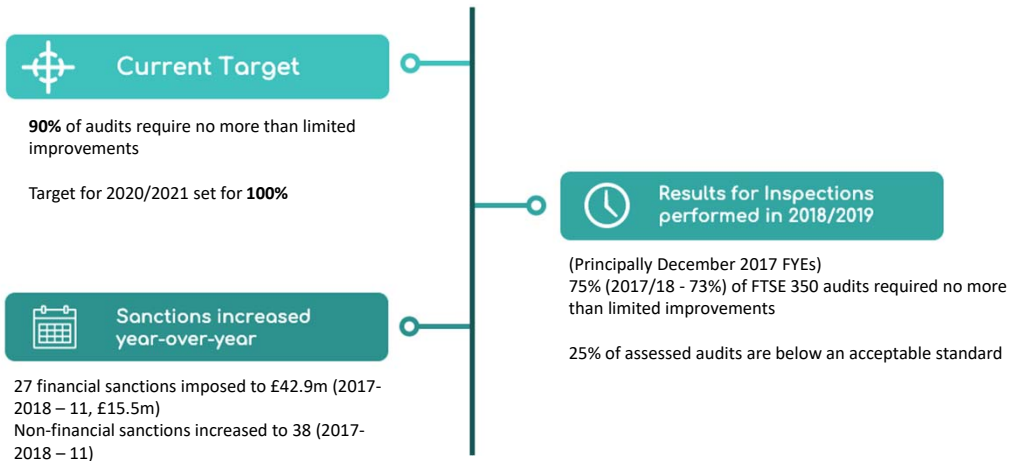


Large audit failures leading to increased scrutiny of the profession



Retention of key talent

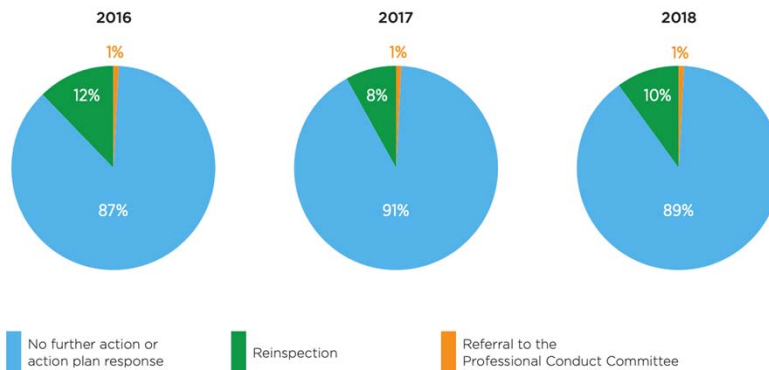
FRC Audit Inspections



© Copyright 2019, MindBridge Analytics Inc.

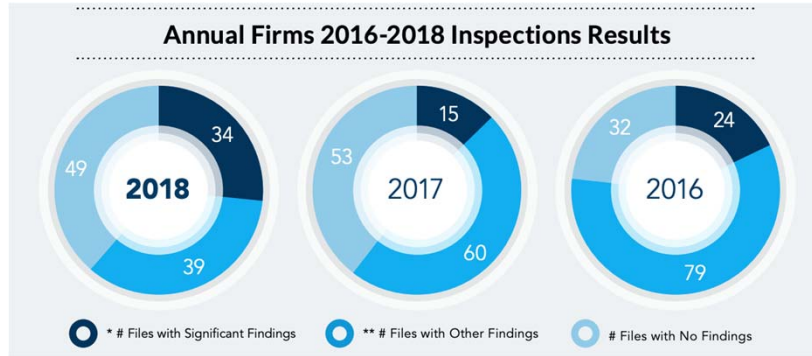
CPA Ontario Practice Inspection

RESULTS OF INSPECTIONS



© Copyright 2019, MindBridge Analytics Inc.

CPAB Audit Inspections



© Copyright 2019, MindBridge Analytics Inc.

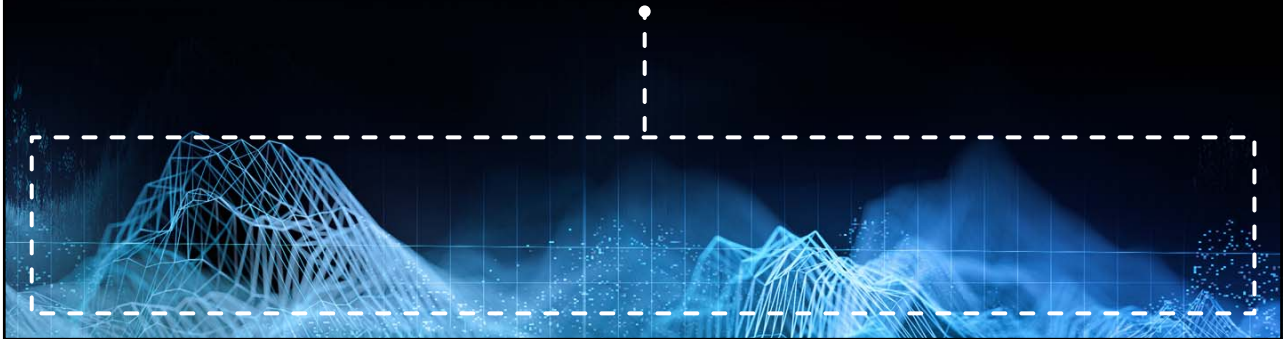
CPA Ontario – Inspection Observations



© Copyright 2019, MindBridge Analytics Inc.

Financial loss: Known vs. unknown

What we see & know:
~\$200B financial loss annually



Actual financial loss:

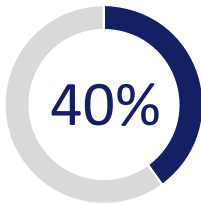
~\$4T annually

due to human error or intent, and growing

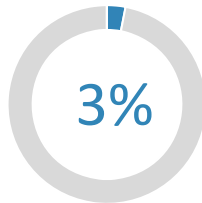
To place this estimate in context, if the 5% loss estimate were applied to the 2017 estimated Gross World Product of USD 79.6 trillion, it would result in a projected total global fraud loss of nearly USD 4 trillion.

Source: Association of Certified Fraud Examiners Report to Nations

Current tools and methodologies are ineffective



Fraud caught by mistakes and tips



Fraud caught by analytics



Months to detect fraud



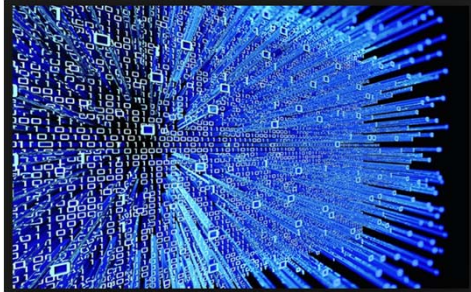
Surge in fraud incidents the last 10 years



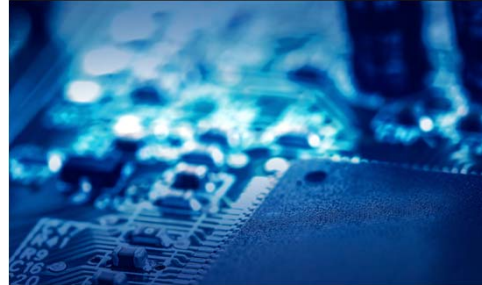
Source: Association of Certified Fraud Examiners, Institute of Internal Auditors
© Copyright 2019, MindBridge Analytics Inc.



Why now?



Big data



Computational power



© Copyright 2019, MindBridge Analytics Inc.

The 3Vs of Big Data

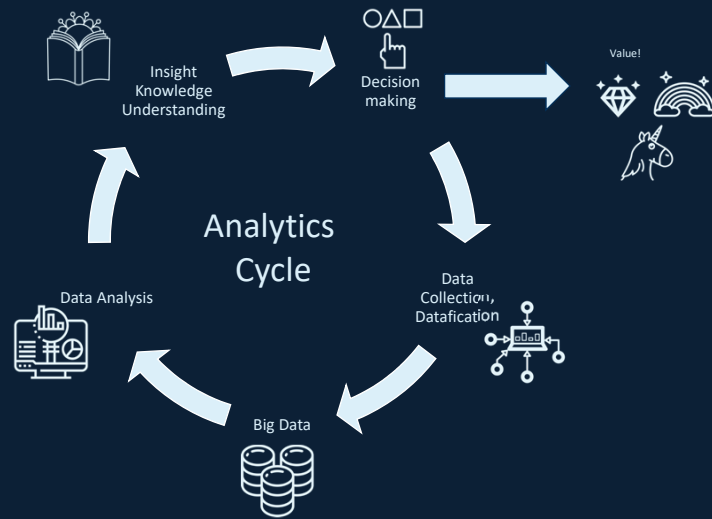


*“The phrase ‘**big data**’ is often used in enterprise settings to describe large amounts of data. It does not refer to a specific amount of data, but rather describes a dataset that cannot be stored or processed using traditional database software.”*



© Copyright 2019, MindBridge Analytics Inc.

“You can’t manage what you can’t measure.”



© Copyright 2019, MindBridge Analytics Inc.

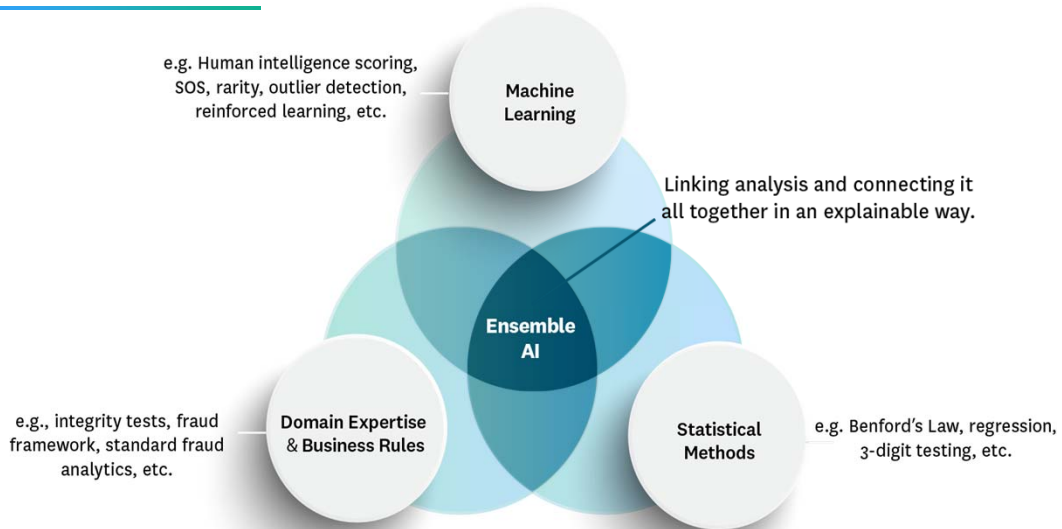
How AI is transforming audit

Traditional audit is rules-based, with limited coverage:



© Copyright 2019, MindBridge Analytics Inc.

How AI is transforming audit



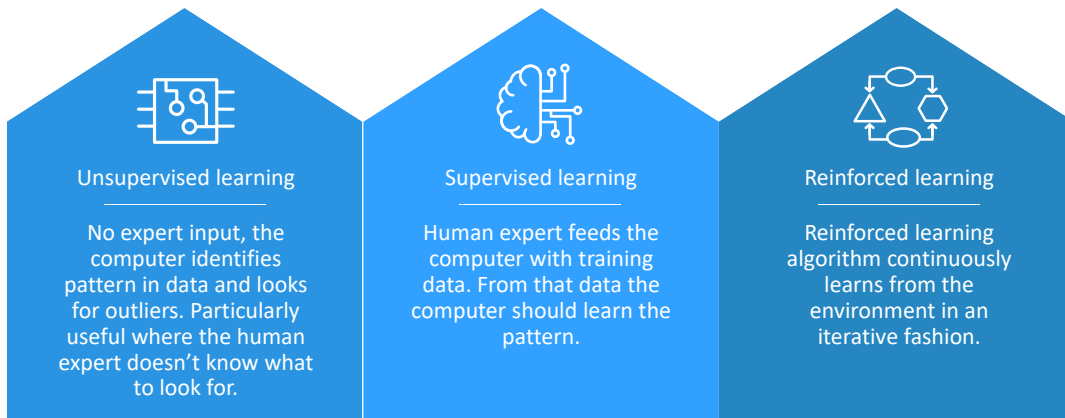
AI is learning-based, with 100% coverage



© Copyright 2019, MindBridge Analytics Inc.

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**"*



© Copyright 2019, MindBridge Analytics Inc.

Clustering



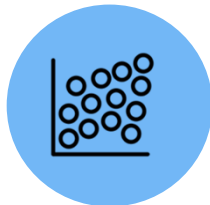
Clustering is a machine learning technique to group a set of objects, such that each of those objects in the group is more similar than those in other groups.

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)

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**



© Copyright 2019, MindBridge Analytics Inc.

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.

Set of all data in the Audit

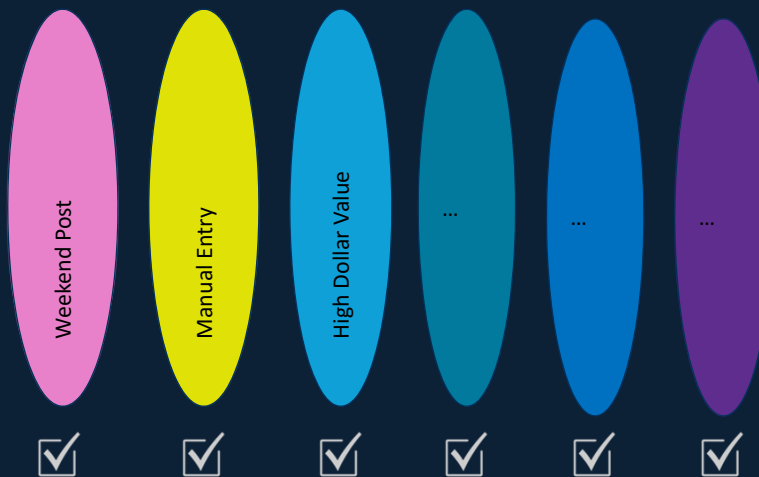
Audit Test: Subset
"Weekend Posts"



© Copyright 2019, MindBridge Analytics Inc.

Rules based tests

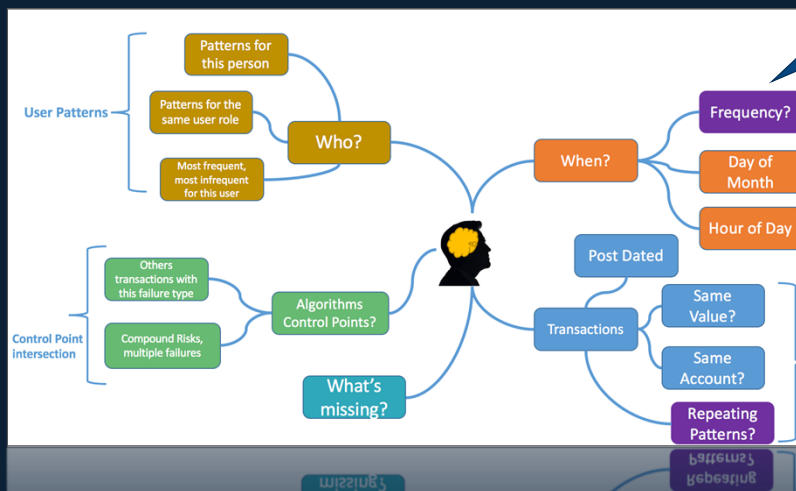
Typical Audit Test Pattern: Tests performed 1 by 1 and human auditor inspects results



© Copyright 2019, MindBridge Analytics Inc.

Human Hypothesis Generation

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



A Human Centric View of Analysis



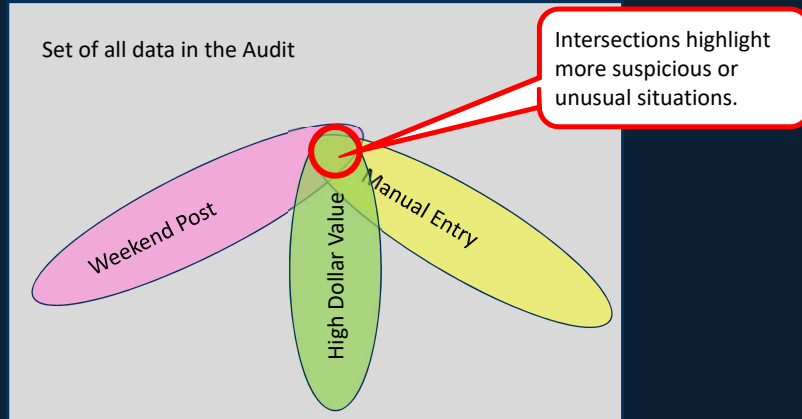
© Copyright 2019, MindBridge Analytics Inc.

Rules Based Testing: Combinations

- Each test has historically been independent of others.
- Combining tests its 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?"



© Copyright 2019, MindBridge Analytics Inc.

Example Distribution of 'Last 3 Digits'

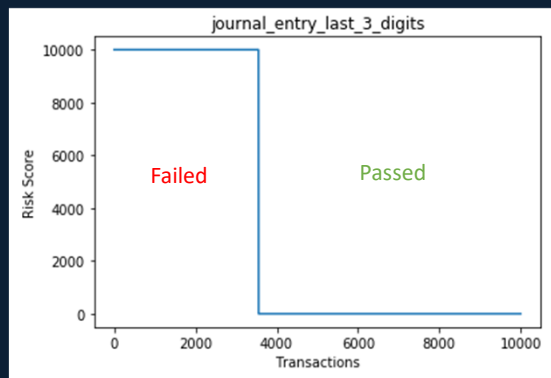
On the right is a visualization of a test result for transactions which fail and pass the "Last 3 Digits" test in a 10,000 transaction journal.

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.

Ranked Risk Factor Score



This explanation is required to understand future visualizations of risk factors



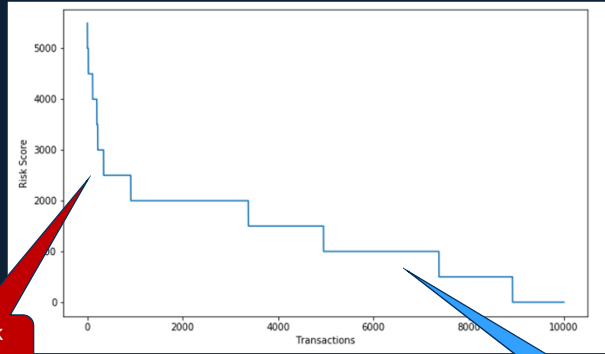
© Copyright 2019, MindBridge Analytics Inc.

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.

Ranked Interest Score



More Risk Factors

Fewer Risk Factors

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

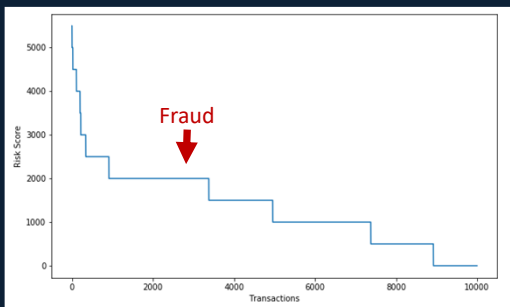


© Copyright 2019, MindBridge Analytics Inc.

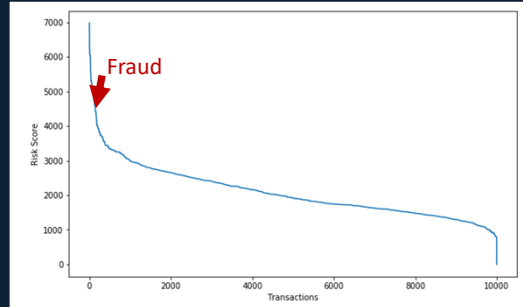
Quick comparison of machine learning vs. rules

- 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

Rules: Ranked Score



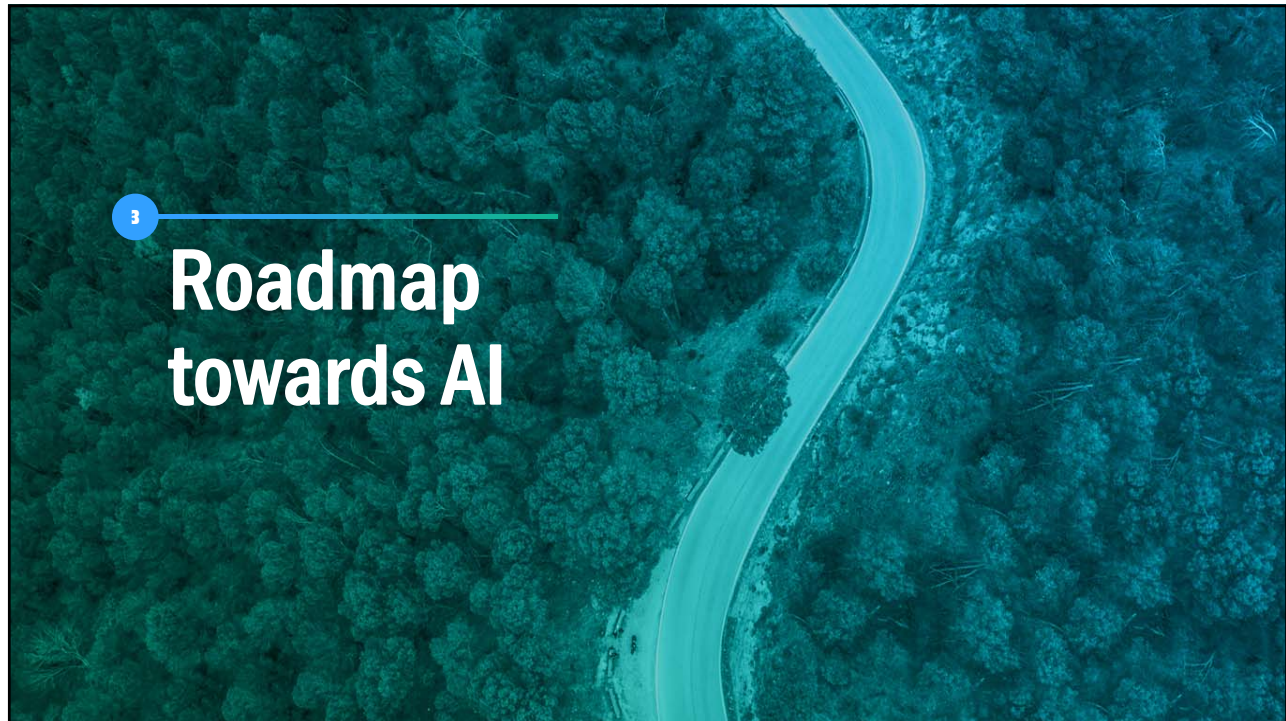
Machine Learning: Ranked Score



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



© Copyright 2019, MindBridge Analytics Inc.



3

Roadmap towards AI

Adapting AI to your business

AI is a cultural change

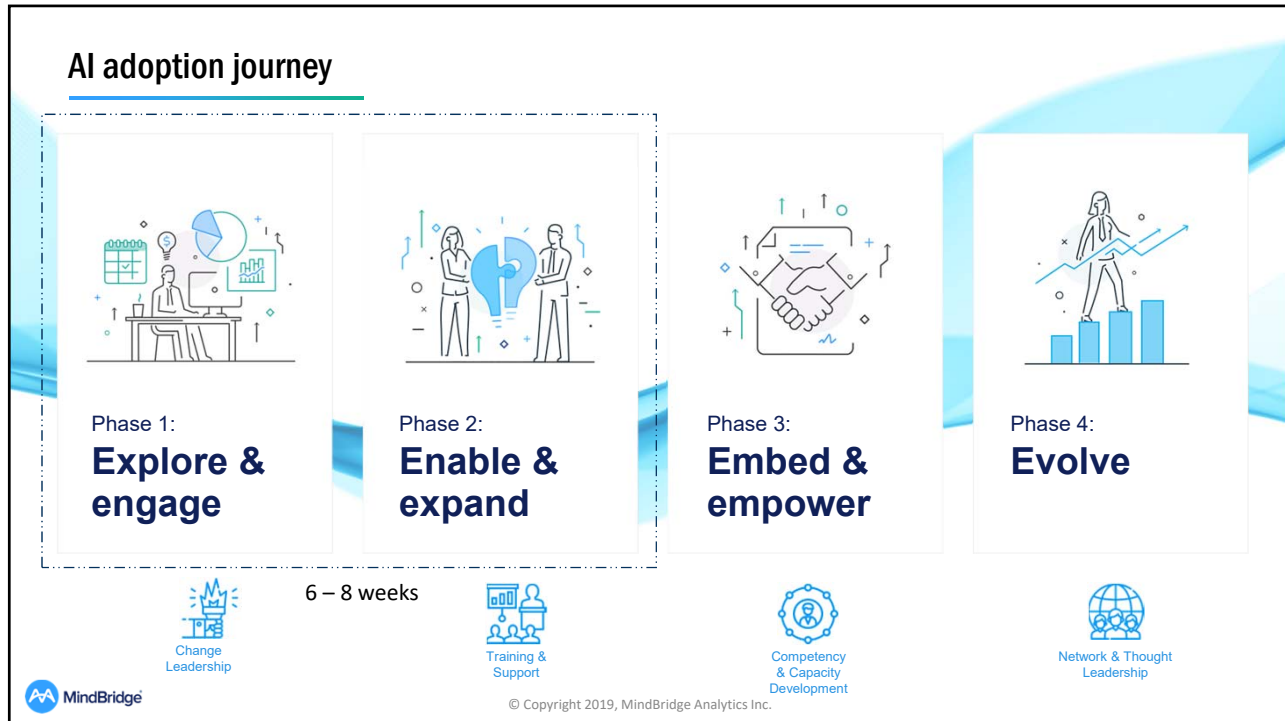
To scale up AI, companies must make 3 shifts

- 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

Harvard Business Review

"Building the AI-Powered
Organization"

August 2019



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

Phase 2: Enable & expand



INFORMING CLIENT
Preparing for a comprehensive, risk-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



PREPARING STAFF

Structuring an
AI-based audit

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?

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



© Copyright 2019, MindBridge Analytics Inc.



Thank you

© Copyright 2019, MindBridge Analytics Inc.