



Data Analytics & Innovation in Audit

Audit Of The Future

Conference 2018

Warsaw

Alan Dudley

Global Head of Data & Analytics, Aviva Internal Audit

10 **September** 2018



Contents

- Why Data Analytics in Internal Audit
- Changing mindsets
- Aviva – statistics and learnings
- **Traditional Audit** to **Additional Insight** to **Innovation in Audit**
- From Insight to Innovation: **Insight Driven Audits**
- From Insight to Innovation: **Automation & Visualisation**
- From Insight to Innovation: **Natural Language Processing**
- From Insight to Innovation: **Machine Learning**
- From Insight to Innovation: **Greater Intelligence - Single Analytics Platform**
- **Practical Examples**

Data Analytics within Internal Audit

- **“Make control testing more robust & transaction testing more substantial”** (Financial Times)
- **“The ultimate goal of the modern business should be to have an internal audit team that functions seamlessly alongside data teams; and this pairing is changing the face of auditing teams”**
(DPJ Consulting)
- **“80% of CEO’s reported that data mining and analysis are strategically important to their business”**
(Global CEO Survey 2016)
- **“40% of internal audit functions have increased their investment in data analytics in the last three years”**
(2016 State of the Internal Audit Profession Study)

Why
**data
analytics?**

Changing Mindsets

The way that we currently think about audit has been useful to get us to where we are today. But to LEAP forward, we have to change mindsets.

"I need to sample 50 files"



"I'm going to test the whole dataset"

"It will take 10 days for data acquisition"



"Data now comes to me regularly"

"Those tasks are admin & not auditing..and take too much time"



"Thankfully the robot can do that for me now"

"Time for that annual audit again"



"My analytics dashboard let's me continually monitor"

Why data analytics?

Measuring The Value Of Data Analytics

- **Delivery:** % of audit plan (number of audits) where data analytics is being used
- **Insight:** To what extent did the analytics tell the audit team something they would not have known otherwise?
- **Efficiency:** To what extent did we save Internal Audit resource by doing the Analytics work?
- **Value:** Extent that our findings provided value to the business?

Why
data
analytics?

Skillsets

1. Algorithmic landscape.

- Machine Learning/Deep Learning
- Natural Language Processing
- Statistics

2. Enhanced Skills

- Data Processing
- Data Transformation
- Data Security (Data Governance)
- Statistical Analytics
- Machine Learning
- Data Visualization

**A new
career path
& skillset for
internal
audit**

The journey towards Innovation within Internal Audit

Traditional

- Sample testing of data
- Manual processing
- Manual testing of data
- Create corrective actions for issues with stakeholders

Insight in Audit

- Full population testing of structured data
- More efficient testing of data
- Robotics for less manual processing
- Create corrective actions for issues with stakeholders

Innovative Auditing

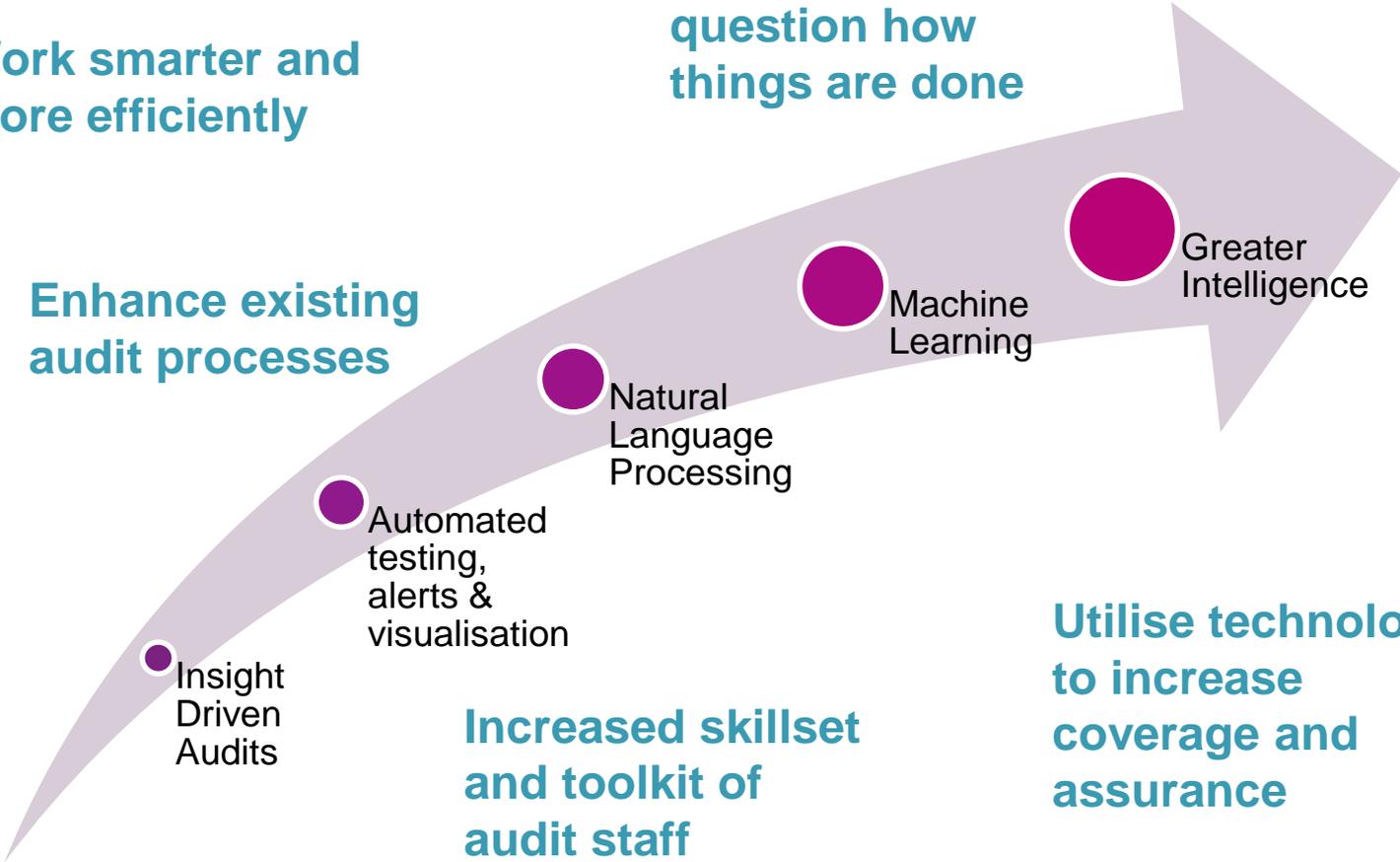
- Full population testing of structured data
- Automatic testing of data
- Robotics to test full populations
- Machine learning as an audit tool
- Natural language processing of unstructured data
- Create corrective actions for issues with stakeholders

From Insight to Innovation

Work smarter and more efficiently

Continually question how things are done

Enhance existing audit processes



Machine Learning

Natural Language Processing

Automated testing, alerts & visualisation

Insight Driven Audits

Greater Intelligence

Increased skillset and toolkit of audit staff

Utilise technology to increase coverage and assurance

The Innovative Approach In Summary

The Innovative Approach

- Full population testing of structured data
- Automatic testing of data
- Robotics to test full populations
- Machine learning as an audit tool
- Natural language processing of unstructured data
- Create corrective actions for issues with stakeholders



Full population across multiple businesses, all analysed in the same way



Outliers automatically highlighted through building visualisation dashboards



Using machine learning and robotics to test full populations of data



Sentiment Analysis and Flesch-Kincaid to test the context and readability of our audit reports



- 1) Able to raise issues with management directly without having conducted a full audit
- 2) Used data analytics to complete a full audit in less than 2 weeks

An internal audit
data analytics

team **creates automation
opportunities,**

performs complex data analytics

& innovates

to create insights

and efficiencies

**that assist positive
change.**

Thank you

We hope you are feeling inspired.