

White paper

# A conceptual framework for effective audit analytics

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## Introduction

### Purpose

This white paper aims to provide auditors with a conceptual framework for establishing an approach to each audit involving analytics, together with guidance around planning, performance and reporting of data analytic audits.

### Background

Audit analytics, encompassing data analytics, continuous controls monitoring, computer assisted audit techniques (CAATs) and data mining are audit work steps which involve computerised analysis of data. Auditors use such analytics to extend their testing beyond sampling. These techniques can identify transactions outside expected ranges; connect data points in different datasets to bring greater meaning; and be used to recalculate numbers, categories and more.

Widely applied approaches, depending on maturity of analytics in the audit team, are:

**Data Analytics** – Used to test controls and validate that business risks are managed. This would generally occur at a point-in-time when an assurance activity is scheduled. Data

analytics is a practice to manipulate and transform data using statistical or analytical techniques to identify trends, anomalies or fraud. It uses tools such as such as generalised audit software, test data generators, computerised audit programs, specialised audit utilities, and computer-assisted audit techniques (CAATs).

**Data Mining** – A practice of analysing large amounts of data through data manipulation techniques. For example filtering, sorting, pivot tables and formulas to pinpoint areas requiring additional audit focus. Data mining can be used to identify trends, highlight abnormalities, and select items for detailed testing.

### Continuous Control Monitoring / Continuous Auditing

– When an organisation has established a foundation of data analytics that are repeatable, either in the internal audit plan or within a business function, the natural next step is to implement a more frequent or real-time process. Where this occurs within the internal audit function to collect evidence and other indicators, the nature of analytics is called continuous auditing. Where the repeatable analytics occur as a feedback mechanism as part of management responsibilities, for example in finance, the nature of data analytics is called continuous control monitoring.

## Discussion

### Issue

Audit analytics can be an incredibly powerful tool in the kitbag of any auditor. By performing data analytics auditors are able to examine entire populations of data, see linkages between disparate functions connected by data, identify fraud, and understand the ongoing operating effectiveness of controls in the business control environment. But data analytics can be hard to conceptualise and even harder to implement. It can take up a lot of resources. Performed poorly or without clear direction and a sound approach, data analytics can generate incorrect results, produce no new insights, and result in an embarrassing outcome for the auditor.

### History

In the early days of audit analytics, data analytics was truly in the realm of the information technology team. Programmers were needed to develop computer programs to extract data, manipulate it and then generate the required outputs. Today, with the right data and the right tools, auditors with only a limited amount of data analytics experience can perform valuable analytics.

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## Requirements to start audit analytics

To be successful with audit analytics there are several requirements that need to be in place. Without these there is considerable risk the analytics will not be successful. The following five 'rights' of audit analytics should be driven by the audit analytics champion in the team, department or organisation.



### The right objective

The audit team needs to have the right objective for the analytics. The auditor must be clear on the aim of the analytic. It is good practice to consult with the audit client to validate the objective is achievable.

For example, an appropriate audit analytic objective may be: 'To identify duplicate transactions in the accounts payable system for the period of July 1 to December 31' or 'To recalculate and compare goods and services tax paid on employee expenses from the period of January 1 to June 30'.

### The right data

While there are different ways to obtain data for the purposes of performing data analytics, to be successful the auditor must have access to the right data. The dataset used in the analytics should be checked at several stages throughout the audit. It should be checked initially when the dataset is identified as being the potential source. It should be rechecked when the data is brought into the analytics software and it should be rechecked during the review process. A final check should also be done when discussing observations with the audit client to make sure the analysis was performed on the dataset they expected.

### The right tool

There are many different tools available for performing data analytics. There are:

- > Specialist audit analytics tools like Arbutus Analyzer.
- > Generalist tools like Microsoft Excel.
- > Visualisation tools like Tableau.
- > More complex programmer type tools like PowerBI, Python, SAS and Stata.

While there are many tools on the market, there will be users in every organisation passionate about particular tools. It is

important the right tool is selected for the audit analytic to be performed, not just run with the tool the analyst is most passionate about.

For example, if the objective is to perform a duplicates payables test using Excel but the dataset has 10 million records in it, then Excel is not going to work effectively. Likewise, if the audit is to identify potential fraud through an examination of e-mail by looking for associated words, then Tableau or PowerBI are not going to be able to help as they are not tools for text analytics.

It is important to use the right tool for the job.

### The right analytic

With many different tools available there are many different analytics that can be performed from geographic analysis to statistical analysis and text analysis to visual analytics.

The auditor must make sure the analytic being performed is the right analytic to fulfil the objective. For example, if the audit is to identify duplicate payments, then the analytic does not need a detailed stratification of payables by product group or an analysis of the ageing of the payables. While these items may be of interest, they are not going to deliver the specific outcome of identified duplicate payments.

Data can be beautiful to an experienced analyst and there may be additional value that can be derived from the data or by connecting the data to other data, however these can be 'rabbit holes' that take the auditor away from their audit objective.

Choose the right analytical approach that achieves the audit objective.

### The right analyst

As mentioned above, good analysts can see beauty in data. They may see connections or trends or seasonality.

The right analyst for a particular audit will have a strong understanding of the way in which the data was created. They will have a perception of the value that can be derived from the data and they will have a strong understanding of the expected outcome.

If a data analyst does not have a curious mind about data or does not understand the data, then they may not perceive issues with the data or identify anomalies which need to be brought to the attention of the audit client. Analytics needs an enquiring mind.

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## Performing analytics – Getting the data

To be able to perform data analytics, there must be data available and ideally the data needed to perform the analytics. There are three ways in which auditors can get the data:

### Get the data for themselves

This can be either by using a connector from the analytics tool to the data, or by using their own access to download the data to a dataset. The benefits of this approach will be:

- › The data will be in the format required.
- › There is a higher degree of confidence about the data transfer process because it is performed by audit staff.

### Get a business analyst, accountant or operator to provide the data

When obtained from this method, auditors will need to accept the formats provided by the business analyst. This could mean the data is in an electronic PDF format, a multiple line report or a spreadsheet.

When data is provided in these ways there is a chance the data becomes more complex than really required. There is also the risk that system mechanisms used to extract the data may already be excluding certain transactions or manipulating the data in a way that masks the true raw data needed for the chosen analytical procedure.

### Get the database administrator to provide the data

In this method there is reliance on the database administrator extracting the right set of data for the analyst from the right tables. An auditor will need to ask the database administrator to provide details of the extract performed, details of the file structure and other information to allow validation that the file is complete and has maintained integrity from the true source to the file provided to the auditor.

Once the analyst has the data, it needs to be validated to ensure the imported data is the right data. This will involve checking the data matches back to the source dataset and ensuring it is the complete file. This can be done using checksums, hash totals and record counts.

## Performing analytics – Choosing the type of analytical procedure

The types of analytics that can be performed are numerous, with some standard audit analytics being:

- › Identifying duplicate payments.
- › Considering all transactions greater or less than a certain amount.
- › Separating all transactions occurring on weekends.
- › Stratifying or categorising transactions by various factors, for example invoices from vendors with same postcode.
- › Comparing files from period-to-period to identify changes, for example vendor masterfile from month-to-month.
- › Identifying gaps in the sequence of transactions
- › Recalculating invoices, GST, interest or pay.
- › Confirming that users performing authorisations were approved.
- › Recasting financial statements based on account roll-ups or account amalgamation.

Sometimes analytical audits will include more than one of these analytical procedures. Whichever procedure is chosen, when applied it should be clearly documented and the process for performing the analytic should be logged.

## Performing analytics – Confirming results

As with any audit, the results of field work of a data analytics audit need to be validated with the audit client.

This will involve validating the correct dataset was used for the analysis and assumptions used in the analytic were correct. It may even involve sharing logs from the analytics with the audit client to demonstrate actions taken to reach conclusions.

It is good practice to begin this consultation with the audit client early in the analytical process.

## Presenting results

When the auditor is satisfied the results obtained from the audit are as expected and valid, then the auditor can move on to develop the reporting for the audit. Sometimes the reporting for analytic audits will be very different from a traditional audit.

The audit report should:

- › State sources of data used in the audit.
- › Describe analysis performed.
- › Provide details of the exceptions or transactions identified for reporting.

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For some analytics audits it may be appropriate to use visualisation techniques to represent the data, while other audits may need inclusion of specific transaction references. Rarely, if ever, would there be a need to include large amounts of data transaction detail in an analytic report.

## Conclusion

### Summary

As mentioned in the introduction, audit analytics can be a powerful tool to protect and enhance organisational value. With the right approach to the analytics there is a good opportunity to:

- › Drive improvement.
- › Reduce risk.
- › Identify fraud.
- › Provide greater assurance.

When starting on the analytics journey, be sure to select an appropriate audit and have the:

- › Right objective.
- › Right data.
- › Right analytic tool.
- › Right analysis approach.
- › Right analyst or auditor to perform the analytic procedures.

With these five 'rights' in place there is good opportunity for success with audit analytics.

### Conclusion

If you believe your audit work can be improved through better analysis of data, then you may be the analytics champion needed for the audit team to make better use of analytic tools.

This white paper sets out a conceptual framework that can be followed to increase likelihood of successful performance of data analytics.

This framework, while applied here in an audit setting can be applied to:

- › Individual audits.
- › Audit planning.
- › Risk assessments.
- › General business analysis.

- › Total quality control analysis.
- › Anywhere data is used.

## Bibliography and References

### Bibliography

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### Purpose of White Papers

A White Paper is an authoritative report or guide that informs readers concisely about a complex issue and presents the issuing body's philosophy on the matter. It is meant to help readers understand an issue, solve a problem, or make a decision.

### Author's Biography

This White Paper written by:

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David is a Director of Survey Design and Analysis Services. He has been performing data analytics as part of audit teams since the early 1990s and introduced and implemented audit analytics at clients in Australia, Taiwan, United States of America and the United Kingdom. He is passionate about the value of data and the insights that can be taken from data when it is transformed into information and knowledge. David is experienced in a range of data analytics packages and programming languages, however David has mostly become well-known for his ability to communicate technical issues in data to executives and non-data specialists.

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The IIA was established in 1941 and now has more than 200,000 members from 190 countries with hundreds of local area Chapters. Generally, members work in internal auditing, risk management, governance, internal control, information technology audit, education, and security.

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