Data Analytics is the process of inspecting, cleansing, transforming and modelling raw data with the purpose of discovering useful information, drawing conclusions and supporting decision making.

Traditional audit methods served auditors for decades but as technology advances and stakeholders' expectations evolve, so does the need for auditors to innovate and transform their approaches in order to keep pace with demand. Advances in technology and software solutions like Computer Aided Audit Tools (CAATS) and Audit Data Analytics (ADA) make it possible for auditors to fundamentally change the way a financial statement audit is done.

What is new about Audit Data Analytics (ADA)?

Classical analytical procedures consist of absolute comparisons of balances with prior year balances or with budgets and forecasts, ratio comparisons and trend analyses. They may also consist of comparisons based on financial or operational data designed to predict the balance in a financial statement classification and form part of the audit judgment process by challenging financial information or the lack of such information.

Audit data analytics is much broader and deeper than traditional analytical procedures. It involves using powerful software tools and statistically complex procedures. These can include: cluster analysis; predictive models; data layering; visualizations; and "what if" scenarios that allow the exploration of new ways to analyse large sets of audit relevant data sourced from internal and external sources in order to produce audit evidence during risk assessment, analytical procedures, substantive procedures and control testing.

What benefits do ADA bring to auditors?

The advances in technologies and software solutions in ADA will enable auditors to improve audit quality in a number of ways, including:

- deepening the auditor's understanding of the entity;
- facilitating the focus of audit testing on the areas of highest risk through stratification of large populations;
- aiding the exercise of professional scepticism;
- improving consistency and central oversight in group audits;
- enabling the auditor to perform tests on large or complex datasets where a manual approach would not be feasible;
- improving audit efficiency;
- identifying instances of fraud; and
- enhancing communications with audit committees.

How ADA can enhance audit quality?

ADA techniques and methods enable audit teams to start analysing client data early in the audit process and begin identifying areas that need further investigation. This enables problems to be identified as early as possible, and audit teams can tailor the audit approach to deliver a more relevant audit by adapting their audit plans accordingly.

ADA can be used to evaluate and assess large volumes of information quickly and can result in better understanding the entity and its systems. This provides opportunity for auditors to make better informed risk assessments so that further audit procedures responsive to those risks are more focused and effective. Since more time is spent focusing on the areas where greater risk is detected, a better and more sophisticated risk analysis, fraud identification and monitoring is possible, enabling increased auditors' focus.

ADA techniques can also enable auditors to perform more frequent testing at shorter intervals, rather than concentrating audit work around year-end. Engaging in continuous testing and monitoring of data again leads to better risk identification, more accurate control assessments, and more timely and relevant audit reporting.

What is important to ensure that ADA can be used successfully?

It is important to first confirm the feasibility of ADA in an audit. The following would need to be considered:

- Availability of data
- Transportability of data
- The client's data media and format
- Costs of using ADA

Once the feasibility of ADA is confirmed the next steps would need to be taken:

- Decide which areas will be subjected to ADA (amend audit plan accordingly)
- Define the objectives of each procedure (what outcome is required?)
- Involve the IT specialists (where necessary)
- Identify the data fields that would be needed to produce the required reports
- Discuss the objectives and benefits with the client and identify a primary client contact person that will assist the audit engagement team
- Request the data files in an acceptable format
- Perform a test run (where ADA is being used for the first time) to ensure that data is correct
- Develop and run the test on the data (as developed to address audit objectives)
- Inspect reports with test results and follow up on any exceptions
- Evaluate the results and conclude
- Communicate findings to the client in an understandable manner (charts and graphs with simple notes can be used)

The following is a list with examples of how data analytics can be used in audits.

INVENTORY		
ASSERTION	**POTENTIALRISK FACTORS AND TRANSACTION TYPES**	**SUBSTANTIVE PROCEDURE**
Existence, Accuracy	Purchases recorded, goods not received.	Compute inventory total and agree the balance to the general ledger.
Completeness	Goods returned, debit note not recorded.	Summarize inventory by product line and agree the summarization to the general ledger.
Completeness	Goods shipped, cost of sales not recorded.	Summarize inventory by location and ensure that inventory at all locations is counted.
Occurrence, Accuracy	Purchases overstated	Perform a sample selection of inventory items for test counts and pricing tests.
Accuracy	Debit notes understated	Report all negative inventory items and obtain explanations for these items.
Accuracy	Cost of sales understated	Report all inventory items with a quantity on hand greater than zero but with a zero unit cost and obtain explanations for these items.
		Report inventory lines with no recorded location and obtain explanations for these items.
		Test the extension of quantity multiplied by cost on all inventory items and list all items that are incorrect.
		Report any inventory items greater than a specified amount for further work.
		Test the entire inventory file for duplicate items.
		Test the sequence of inventory count tags for gaps and duplicates.
Valuation	Inventory not correctly valued.	Age all inventory items and prepare an aged schedule.
		Report all inventory items that have not moved for a specific period or were purchased before a specified date.
		Compare all costs to selling prices and list all items that have a cost greater than the selling price.
		Summarize the inventory file into grades (if grades have been assigned to inventory items).
Valuation	Standard costs do not approximate actual costs.	Report all current-period standard costs that differ to the prior period by a set percentage for closer scrutiny.
		Produce a report of all standard costs that have unusual relationships, for example: ▪ Overhead costs with no labor cost ▪ Labor or overhead cost with no material cost ▪ Standard costs greater than selling prices. ▪ Obtain explanations for the unusual relationships.
Presentation	Presentation inadequate.	Summarize inventory by class (e.g., finished goods, work-in-progress, raw materials) and ensure the summarization agrees to the entity's records.
Purchases Cutoff	Goods received in this period, purchase recorded in next period.	Summarize purchases by month and assess whether unusual fluctuations exist at period end. Select a sample of inventory purchases in the period prior to period end for subsequent testing.

ACCOUNTS RECEIVABLE		
ASSERTION	**POTENTIALRISK FACTORS AND TRANSACTION TYPES**	**SUBSTANTIVE PROCEDURE**
Occurrence	Sale recorded, goods not shipped or service not performed.	Total all balances and reconcile the total to the general ledger.
Completeness	Goods returned, credit note not recorded. Cash received, receipt not recorded.	Perform a sample selection and automatically prepare the confirmation requests.
		Produce a report that lists all high-value balances or invoices for additional audit procedures.
Accuracy, Occurrence	Sales overstated	Test the entire sequence of invoices and delivery notes for duplicates.
Accuracy, Completeness	Credit notes understated Receipts understated	Test the entire sequence of credit notes for gaps in the sequence.
Valuation	Allowance for doubtful debts incorrectly valued.	Test the accuracy of aging categories in the aged trial balance.
		Prepare a report of all amounts in excess of credit limits.
		Prepare a report of all accounts that are older than a specific date or the due date.
		If the provision is based on recoverability percentages, reperform the provision calculation.
Valuation	Foreign currency receivables incorrectly valued.	Identify all foreign currency receivables or open invoices. Summarize the information by currency and recompute the foreign currency receivable amounts.
Presentation	Presentation inadequate.	Prepare a report of all credit balances in receivables and ensure they are correctly classified.
		Prepare a report of all amounts due 12 months after the period end.
		Prepare a report of miscellaneous receivables and ensure they are correctly classified.
Sales Cutoff	Goods shipped or service performed in next period, sale recorded in current period.	Select a sample of invoices invoiced in the period prior to period end for cutoff testing.
		Prepare a report of all invoices with a delivery note number greater than the last delivery note of the current period.
		Summarize invoices by month. Assess whether unusual fluctuations exist at period end.
Cutoff of Credit Notes	Goods returned in this period, receipt recorded in next period.	Select a sample of credit notes recorded during the first period after period end to test cutoff.
		Summarize credit notes by month. Assess whether unusual fluctuations exist at period end.

ASSETS		
ASSERTION	**POTENTIALRISK FACTORS AND TRANSACTION TYPES**	**SUBSTANTIVE PROCEDURE**
Existence, Accuracy Rights, Completeness	Purchases recorded, property not received. Property sold, sale not recorded.	Total cost, accumulated depreciation, gain or loss on disposals, and current period depreciation and trace the totals to the general ledger.
Accuracy	Purchases overstated.	Recalculate all gains or losses on disposal.
Accuracy	Sales understated.	Perform a sample selection of assets for physical inspection.
		Prepare a report that shows all additions in the current period or perform a sample selection of additions.
		Prepare a report that shows all disposals in the current period.
		Summarize assets by category.
		Summarize assets by age.
		Summarize assets by depreciation method.
		Summarize assets by depreciation rate.
		Summarize assets by location.
		Report all assets that do not have a recorded location and obtain explanations for these items.
		Test the entire file for duplicate assets.
Accuracy, Valuation	Expense recorded, depreciation not valid.	Reperform the depreciation calculation on all assets and compare the calculated expense to the actual expense.
	Depreciation expense overstated	Report all assets that do not have a depreciation rate and obtain explanations for these items.
Presentation	Presentation inadequate.	Extract the information necessary for the cash flow statement.
		Prepare a schedule by major class of assets detailing balance sheet disclosure.

INCOME STATEMENT

ASSERTION	POTENTIALRISK FACTORS AND TRANSACTION TYPES	SUBSTANTIVE PROCEDURE
Occurrence **Accuracy** **Completeness**	Expense recorded, expense not incurred.	Summarize transactions by account number for reconciliation to the trial balance.
	Expense overstated	Summarize transactions by period (e.g., quarterly, monthly, weekly).
		Summarize transactions by cost center or division.
		Perform a sample selection of expense transactions for tests of detail.
		Perform a random sample of transactions for tests of the operating effectiveness of control.
		Test the sequence of voucher numbers for duplicates.
		Summarize transactions by transaction type (e.g., standard journals, expenses).
		Select a sample of journal vouchers for testing.
		Test for gaps in the voucher number sequence
Completeness	Goods or other asset received or expense incurred, purchase/ expense not recorded.	Total all balances and reconcile the total to the general ledger.
	Disbursement recorded, cash not disbursed. Debit note recorded, goods not returned.	Perform a sample selection and prepare confirmation requests.
Accuracy **Completeness**	Purchases/expenses understated. Debit notes overstated. Disbursements overstated.	Test the sequence of debit notes for gaps and duplicates.
Valuation	Foreign currency payables balance incorrectly valued.	Identify all foreign currency payables. Summarize the information by currency and recompute the foreign currency payable amounts.
Presentation	Presentation inadequate.	Prepare a report of all debit balances in payables and ensure they are correctly classified.
		Prepare a report of all payables with a due date greater than 12 months after period end.
Purchases Cutoff	Goods or other asset received or expense incurred in this period, purchases/expense recorded in the next period	Select a sample of purchase invoices recorded in the period after period end for cutoff testing.
		Summarize purchases by month. Assess whether unusual fluctuations exist at period end.
Cutoff of Debit Notes	Goods returned in next period, debit note recorded in this period.	Select a sample of debit notes recorded in the period prior to period end for cutoff testing.
		Summarize debit notes by month. Assess whether unusual fluctuations exist at period end.

EMPLOYEE COSTS		
ASSERTION	**POTENTIALRISK FACTORS AND TRANSACTION TYPES**	**SUBSTANTIVE PROCEDURE**
Occurrence	Expense recorded, expense not incurred.	Report total of payroll files.
Accuracy	Expense overstated.	Report duplicate employees on the payroll records.
		Report all new employees for manual checking against payroll authorization files.
		Perform a sample selection of payroll expenses for tests of detail.
		Perform a random sample of pay rates for manual verification.
		Report pay rates of selected employees for manual checking against union agreements.
		Summarize the payroll by hours worked per employee.
		Summarize the payroll by department.
		Compare master file details to prior period and isolate all variances.
GENERAL LEDGER		
ASSERTION	**POTENTIALRISK FACTORS AND TRANSACTION TYPES**	**SUBSTANTIVE PROCEDURE**
Occurrence **Accuracy**	Fraudulent transactions	Report duplicate journals (same account/amount, same JE number/amount)
		Report journals with even amounts.
		Report journals processed by unauthorised user.
		Report journals processed on weekend dates.
		Report a sample of journals over a specified amount.
		Report duplicate accounts or account descriptions
		Report dormant accounts.
		Report transactions with same person initiating and authorising transaction