DATA ANALYTICS :
THE FUTURE OF AUDIT

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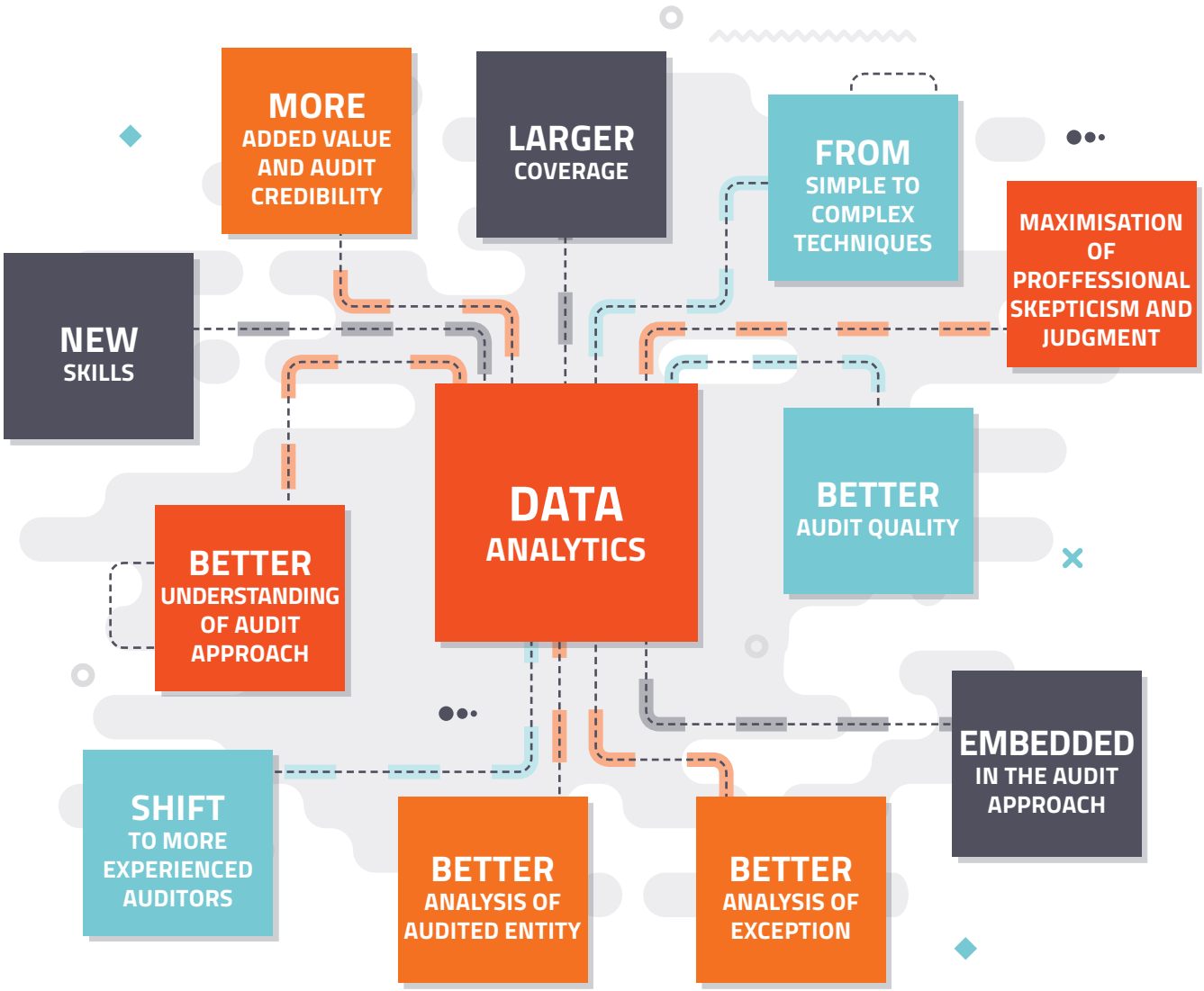
The purpose of this publication is to demonstrate that data analytics techniques are embedded in the audit approach and that data analytics offers many opportunities to improve the audit quality.

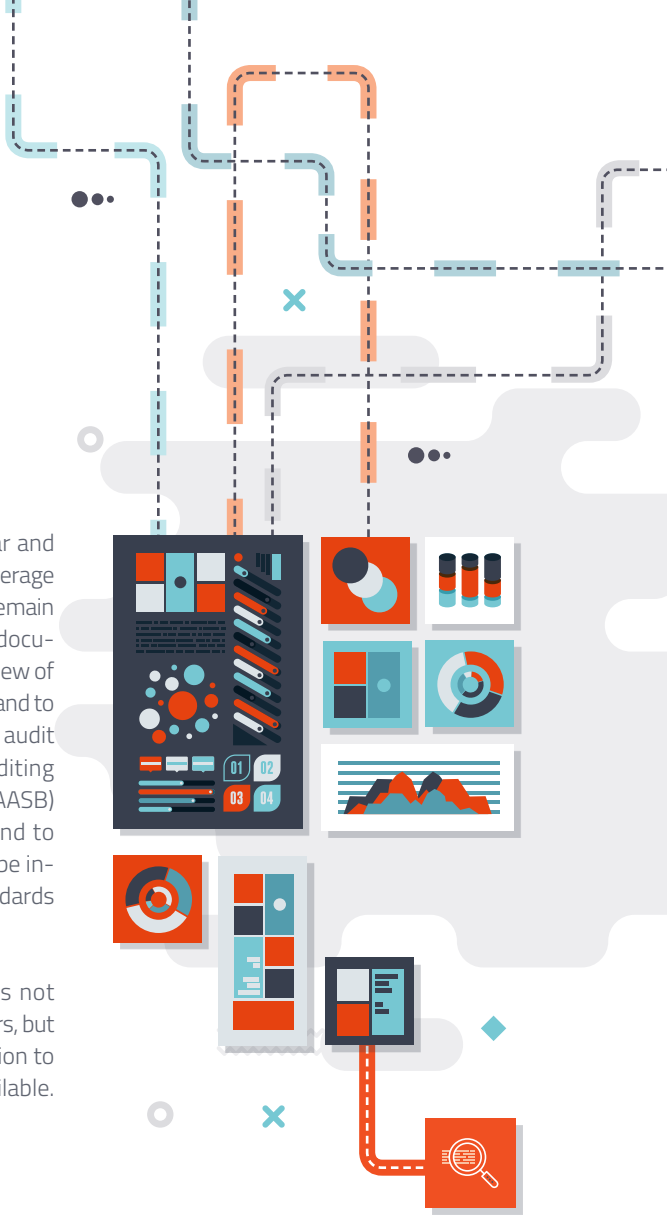
TODAY DATA ANALYTICS TECHNIQUES ARE ALREADY EMBEDDED IN THE AUDIT APPROACH

Today most of the auditors apply data analytics in their day-to-day audit activities. The techniques are sometimes basic, in other situations more complex. Basic analytics procedures are performed through softwares such as excel that used to sort information (for example top 10 customer by revenue) and match data from separate sources (for example individual fixed assets still in use in the fixed assets management system with the fixed asset as recorded in the general legder). More advanced procedures involve IT audit techniques and are used, for example, to recalculate the accuracy of trade receivables ageing balance, to realize a three way match detail testing, to isolate goods shipped without sales invoice,...

BUT DATA ANALYTICS OFFERS MANY OTHER OPPORTUNITIES TO IMPROVE AUDIT QUALITY

Data analytics is a key element in the strategy to improve audit quality. Analytics tools will assist the auditor in the identification of risks through procedures such as the search for one time vendors, direct expenditure postings, vendors with payments on multiple bank accounts, duplicated payments,...





1. DATA ANALYTICS, THE FUTURE OF AUDIT

Data analytics (DA) is the process of examining data sets in order to draw conclusions about the information they contain, increasingly with the aid of specialized systems and software. Data analytics technologies and techniques are widely used in commercial industries to enable organizations to make more-informed business decisions and by scientists and researchers to verify or disprove scientific models, theories and hypotheses.

With the increasing volume of data in business today, data analytics can be used as an audit technique to better understand and analyze large volumes of data. Equipped with a more in-depth knowledge of the entity's business, the auditor is able to focus on items of greater audit interest. Data analytics may also provide recommendations to clients.

Will sampling techniques disappear and systematically be replaced by full coverage of the population? Many questions remain unanswered. The objective of this document is to provide a high level overview of data analytics in the audit approach and to provide examples of data analytics audit procedures. The International Auditing and Assurance Standards Board (IAASB) is currently evaluating whether and to what extent data analytics should be integrated into the international standards on auditing (ISA's).

The way an audit is executed has not fundamentally changed in many years, but now it is time for the audit profession to adapt to the new technologies available.

2. ADVANTAGES AND CHALLENGES

Data analytics enhances audit quality because the population tested is larger with the objective that 100 % of the data is screened. As a result, auditors can generally derive a combination of quality and value from its use.

Data analytics provide an opportunity to maximize the effectiveness of the human element. For example, technology solutions can reduce the amount of time dedicated to manual analysis, allowing more time to be spent by the auditor on the more judgmental aspects of an analysis Data analytics increases the automation in the audit process which allows the auditor to increase his focus on the more fundamental audit procedures and the more complex and risky areas of audit. The application of professional skepticism and professional judgment is improved when the auditor has a robust understanding of the entity and its environment. In an increasingly complex and high-volume data environment, the use of technology and data analytics offers opportunities for the auditor to obtain a more effective and robust understanding of the entity and its environment, enhancing the quality of the auditor's risk assessment and response. The enhanced use of professional skepticism and professional judgment in the audit process will also impact the attractiveness of audit as a career option.

Data analytics presents an opportunity for more valuable and informed engagement and dialogue with those charged with governance within the audited entity. Modern data analysis methods also support producing more reliable information for the users. Ultimately, data analytics adds value to the audit and thus increases the credibility of the audit. While the benefits are clear, data analytics also means new challenges. The analytic techniques should be embedded in the audit approach but testing large populations often generates a high number of exceptions. What is the audit conclusion in case of numerous exceptions? Also the "acquisition" of data can take significant time for the audit team. The information delivered by the client should be in a format that can be used by the auditor and this is not always obvious. The fragmentation of the ERP systems market is also a hurdle: the format of information can be different from system to system.

The use of data analytics in the audit can encompass a wide range of techniques. The auditor of the future should be familiar with simple data analytics, but also more complex data analysis techniques. Data analytics should be embedded in the audit approach, not acquiring tools.

3. INTEGRATION OF DATA ANALYTICS IN THE AUDIT APPROACH

Data analytics is integrated in the audit approach conforming the International Standards on Auditing (ISAs). Consequently, the ISA audit approach remains unchanged.

Data analytics can be applied throughout the phases of the audit, including:

- Plan the audit.
- Perform tests of operating effectiveness of control.
- Perform substantive procedures.
- Evaluate results.

Data analytics can either be exploratory (plan the audit) or used to perform further audit procedures (i.e., tests of controls and substantive procedures).

3.1 PLAN THE AUDIT

Exploratory data analysis (EDA) is an approach to analyzing data sets to summarize their main characteristics, often with visual methods. The auditor does a first and general analysis of the information of the data in order to get preliminary insights about the data. It can be used in the planning phase and during the risk analysis. It starts with looking at the data and asking questions such as:

- What does the data indicate?
- Does the data suggest something might have gone wrong?
- Where do the risks appear to be?
- Are there potential fraud indicators?
- What assertions should we focus on?
- What models and approaches appear to be optimal for analytical procedures?

Exploratory data analytics are generally used when performing risk assessment procedures, including:

- Understanding the entity and its environment.
- Identifying and assessing the risks of material misstatement.
- Designing further audit procedures that are tailored to the risks identified.

Population analysis can also be performed through data analytics. It can help the auditor design tailored audit procedures by providing general information about a population (e.g., total distribution of debits/credits, amounts, volume, and timing of transactions) based on common fields in the general ledger. Depending on the types of statistics, this insight can be used for enhanced risk assessment. It can also be used prior to the performance of the further audit procedures when we have obtained the population and want to enhance the auditor's understanding of the population.

3.2 IMPLEMENTATION OF THE AUDIT APPROACH

When using data analytics to perform audit procedures, the techniques are more structured than exploratory data analytics and tend to be more mathematical and analytical (e.g., regression analysis).

Using data analytics to perform audit procedures can provide the auditor with sufficient appropriate audit evidence regarding the assessed risks. The following types of procedures could be supported by data analytics:

- Tests of controls.
- Tests of details.
- Substantive analytical procedures.

Tests of Controls

Inspection or reperformance of controls — Data analytics may be used to test the operating effectiveness of controls through inspection of the data for evidence of the control operating as designed. In some circumstances, data analytics can also reperform the control activity itself.

Tests of Details

Recalculations — Data analytics can be used to perform a recalculation of an entire population as opposed to only a sample of items.

Reconciliations and Roll forwards — Data analytics can be used to compare and agree information from multiple sets of data, or to roll forward data from one period to the next.

Substantive Analytical Procedures

Regression Analysis — Data analytics can be used to analyze the relationships between variables in the data to identify differences between recorded amounts and our established expectations that may warrant further investigation.

Other

Data analytics may also be useful in other ways.

Automation of Manual Procedures — Data analytics may be used to perform time-consuming and often tedious manual audit procedures.

Journal Entry Testing to Address the Risk of Management Override of Controls — Data analytics are often used for testing journal entries to address the risk of management override of controls through the use of an electronic approach.

3.3 EVALUATION OF MISSTATEMENTS

An audit allows the auditor to express an opinion about whether the financial statements are free of material misstatement. Because the auditor must limit overall audit risk to a low level, reasonable assurance must be at a high level. Stated in mathematical terms, if audit risk is 5 percent, then the level of assurance is 95 percent. When analyzing exceptions and misstatements, the auditor should always keep in mind that the main objective should be to provide reasonable assurance. However, data analytics will not lead to providing an absolute assurance.

Deviations identified through data analytics should be analyzed, sorted and clustered. Part of the deviations can often be justified. For example, when a system is configured to prevent pricing changes, a manual price change is a deviation. However, if the change has been duly approved, there is no issue from an audit point of view.

And what if data analytics identifies misstatements? Regardless of the audit technique employed to identify misstatements, once the auditor has established that a misstatement exists, he should investigate the nature and cause of any misstatements identified and evaluate their possible effect on the purpose of the audit procedure and on other areas of the audit.

In general, there are 3 different types of misstatements:

- **Factual Misstatements** are misstatements about which there is no doubt.
- **Judgmental Misstatements** are differences arising from the judgments of management concerning accounting estimates that the auditor considers unreasonable, or the selection or application of accounting policies that the auditor considers inappropriate.
- **Projected Misstatements** are our best estimate of misstatements in populations, involving the projection of misstatements identified in audit samples to the entire populations from which the samples were drawn.

When the auditor performs a data analytics as a test of details to test 100 percent of the population, he typically would not identify a projected misstatement because he has not performed an audit sample. Audit sampling procedures are used to draw inferences about the entire population based on the results of testing a sample of selected items from the population. This involves projecting factual misstatements identified in the sampled items to the remainder of the population (projected misstatement). However, when using data analytics as a test of details, there may be circumstances in which the auditor identifies a large number of exceptions such that it is not practical to investigate them all individually. If he samples the exceptions and identifies a factual misstatement in his sample, and the nature and cause of the misstatement is specific to the exception population, it is appropriate to project the identified misstatement to the population of exceptions, resulting in a projected misstatement.

For example, the use of data analytics as a test of details to perform a 100 percent match of recorded invoices to a standard price listing. In this example, the invoice prices are automatically generated at the time an invoice is created based on the standard price listing; however, there are circumstances in which deviations from the standard price listing may be approved and manually overridden. The results of the data analytic identified a number of exceptions indicating manual overrides from the standard pricing had been applied to invoices. In order to assess whether these manual overrides are properly approved, the auditor selects a sample of the exceptions to test. Upon investigation of the sample of exceptions he determines that a portion of them were not properly approved and therefore represent factual misstatements in the population. It would then be appropriate to extrapolate the identified factual misstatement over the remaining population of exceptions to determine the corresponding projected misstatement within the population.

Data analytics tools

The auditor can use classical data analytics tools but also more sophisticated techniques.

Below are examples of tools

- Excel Analytics
- ACL – IDEA CaseWare
- Softwares that can aid in performing analytical procedures by using regression analysis to model the relationship between an amount being tested and data expected to be predictive of the amount.

In analytics, the acquisition of data is key. The information used by the auditor should be validated (for example reconciled to the general ledger and/or analysis of the period covered for completeness). Any change made to the base information should be documented.

Examples of data analytics routines

Data analytics can be applied throughout the phases of the audit. Please find below some examples of data analytics routines and considerations per audit phase:

CONTROL OBJECTIVES	*EXAMPLES*
PLAN THE AUDIT	
Planning	
First inventory of data analytics possibilities. Today, the auditor always considers the use of data analytics techniques in the planning phase. The more the core processes are supported by an information system, the more data analytics possibilities there are.	The auditor must ask the following questions: ▪ To what extent are processes supported by an information system? ▪ To what extent are underlying data of transactions available? ▪ What kind of data analytics might be applied? ▪ Which tools do I have available?
Evaluation of the data quality of the general ledger whereby an attempt will be made to check whether the data is complete, honest and available for the desired period.	To deal with the following topics on the basis of interviews and first procedures: ▪ To what extent are controls available that guarantee the completeness, integrity and availability of underlying data? We think of examples such as: ▪ Access to underlying data and the possibility to make changes; ▪ Review of the underlying data by the client by, among other things, reconciliation of any subsystems to the general ledger; ▪ Does the contact (IT manager, financial manager, etc.) have enough expertise with the client to handle data extraction?
Risk assessment	
First analysis of the general ledger to determine the most important transaction flows within the organization. A good analysis can lead to a better description of the identified risks and the data analytics possibilities. In total this will lead to a more targeted approach to the risks. This data is used, among other things, for the *preliminary analytical review.*	Through data analytics procedures obtain a first insight into: ▪ Type and volume of transactions; ▪ Mapping core processes; ▪ Checking accounting transactions against expected accounting patterns (example: are all turnover entries booked directly against the trade receivables? Are there turnover entries which do not pass through the sales ledger?) ▪ Seasonality of transactions; ▪ Mapping the evolution of relevant KPIs (stock rotation, number of days of customer credit, etc.)

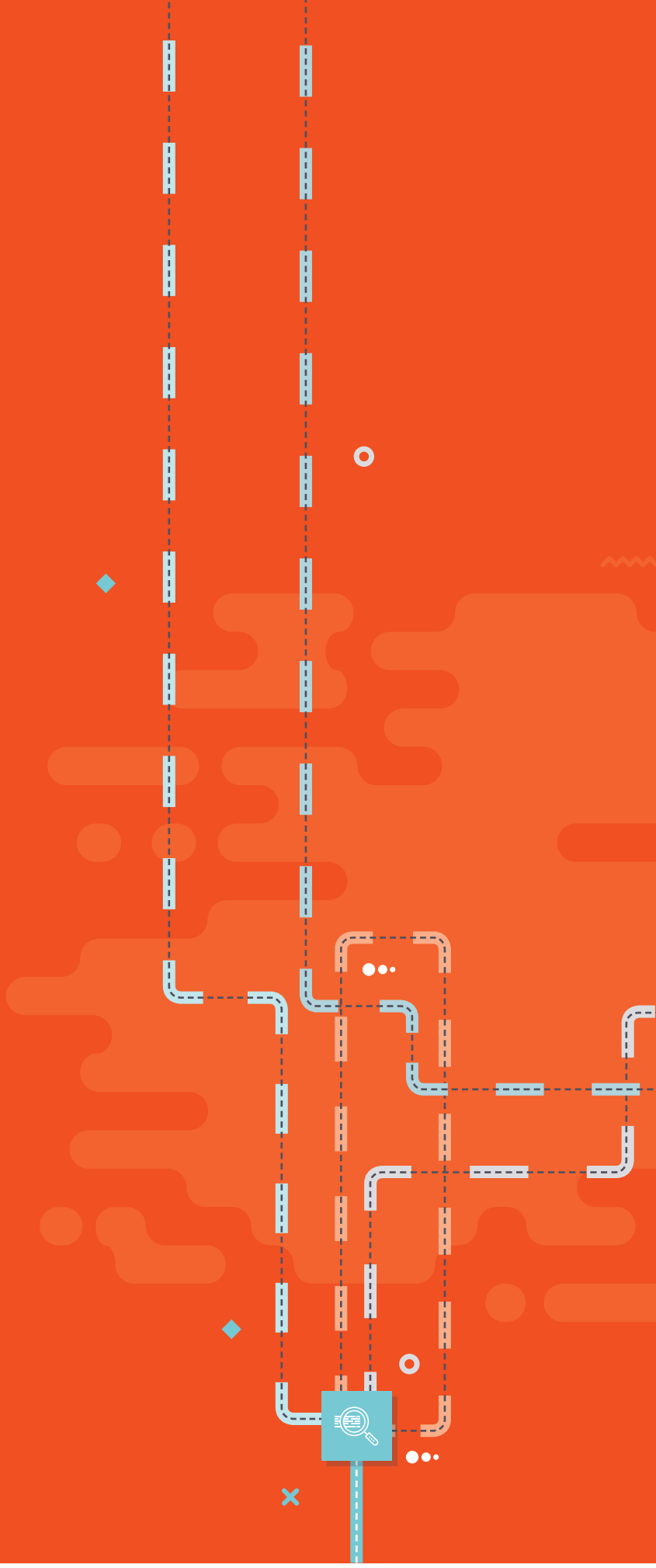
EXECUTE THE AUDIT

Tests of controls

Perform tests of controls using data analytics	Examples include the following tests of controls: ▪ Analysis of all paid invoices of the fiscal year: approval present? Timely? Correct person? ▪ Analysis of credit limits by customers: are there exceedances? ▪ SOD analysis on Order to Cash Cycle (This data analytics procedure identifies the sales processing permissions assigned to each user based on their ERP profile (on the extraction date) and compares these permissions to pre-defined expectations for how permissions would normally be assigned to prevent ERP users having incompatible duties when processing sales transactions. ▪ Analysis of access rights of users and possible changes throughout the fiscal year ▪ Preparation of the activity-role matrix (which activities relate to which roles and related statistics)

Substantive procedures

Transaction analysis of various business processes by means of data analytics techniques	Examples include: ▪ Three-way match within the order-to-cash cycle (This data analytics procedure compares information from the customer invoice details used to record revenue with the related sales order and delivery document information within the ERP (i.e., three- way match). The comparison is focused on the attributes of quantity and price). ▪ Transaction flow verification: verify whether the actual booking sequences are aligned with the designed process as described in our risk assessment. ▪ Inventory subledger data analysis (This data analytics routine perform specific subledger data analysis (balance as per year-end, costing method, manual changes and negative quantities/cost by inventory category). ▪ Analysis of payments made after period end (This data analytics procedure categorizes cash payments recorded subsequent to the period end through to the Extraction Date. The categorization is done based on the earlier of the expected delivery date (as recorded on the purchase order) or delivery date obtained from the underlying invoice or delivery document to which the payment relates, as cash payments that appear to relate to goods delivered before the period end or after the period end and also identifies the period in which the related liability was originally recorded.)



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