# DATA ANALYTICS: A GAME CHANGER FOR AUDITING

*Muhammad Imran*
*Assistant Director, SAI Pakistan*

## Introduction:

The world has witnessed the beginning of the fourth industrial revolution; global digitalization is underway. To ensure high-quality control over public money, the Supreme Audit Institutions (SAIs) should introduce modern technologies and learn to use their whole toolkit efficiently. In INTOSAI members' opinion, the entire budgetary process will depend on it, and the public sphere itself will become more transparent and open for citizens.

Before going deep into the topic, it is essential to know what big data is? It may be defined as high-volume, high velocity, and high-variety information assets that demand cost-effective, innovative forms of information processing for enhanced insight and decision-making (Gartner, 2013). From this definition, one can extract three characteristics, i.e., volume, velocity, and variety, which makes the big data unique, are referred to as Three Vs of big data. However, as Gartner explains, big data must be analyzed or processed innovatively in order to be relevant and useful for decision making. Indeed, big data as a concept is often discussed in conjunction with the analysis of the data.

Data analysis is a process of inspecting, cleansing, transforming, and modeling data with the goal of discovering useful information, informing conclusions, and supporting decision-making. Data analysis has multiple facets and approaches, encompassing diverse techniques under various names, and is used in different business, science, and social science domains. (INTOSAI, 2019). Whereas, AICPA has defined data analytics in audit as "the science and art of discovering and analyzing patterns, identifying anomalies, and extracting other useful information in data underlying or related to the subject matter of an audit through analysis, modeling, and visualization for the purpose of planning or performing the audit, "To auditors, the data in (or contents of) big data refers to collections of multiple types of data, which could include some mix of traditional structured financial and non-financial data, logistics data, sensor data, emails, telephone calls, social media data, blogs, as well as other internal and external data.

## Evolution of Audit Techniques and Tools

Despite the fact that audit strategies have been depended upon for a long time, the conventional act of auditing has been in presence for a generally brief period. Besides, the emphasis has historically been placed on a systematic, backward-looking approach whereby key events and activities are often identified long after their occurrence or merely undetected. Given that recent developments and technologies facilitated a

movement away from the historical paradigm and toward a more proactive approach, it is essential that auditors must understand what the future audit entails and how they might begin to envision a logical progression to such a state. To enhance this comprehension, it is worth mentioning how auditing has evolved from its start in the early twentieth century. In this regard, a brief history of the evolution of auditing through different computer audit applications is as follows:

| S.No | 1970's | 1980's | 1990's | 2000's and onward |
|---|---|---|---|---|
| 1 | Applications with programming languages | Applications with third-generation programming languages | Applications with fourth-generation programming languages | Web-enabled software (XBRL) |
| 2 | First-generation audit software (batch) | Second generation audit software (interactive and batch) | Third generation Audit Software (Interactive and batch based on PCs) | Continuous Audit |
| 3 | Simple parallel simulations | Extensive parallel simulations | Comprehensive testing and data analysis | Digital Analysis |
| 4 | Test Batches / Integrated Test Utilities. | Test Batches / Integrated Test Utilities. | Software Audit | Audit Assurance Software |
| 5 | Entry / exit tests | SCARF / SARF (Text Definition) | | |
| 6 | Internal Control Review | Automated internal control review questionnaires | Computerized internal control review questionnaires | Control self-assessment. |
| 7 | Flowchart Control Questionnaires | Program flow diagrams | Process flows with an emphasis on data audit | Viewing the software |
| 8 | First computer-based on a sampling of monetary units | More developed, dollar sampling unit | Various sampling options, including stratification | Less emphasis on sampling. |
| 9 | Control Matrices | Better control | Expert systems | Neural networks and artificial intelligence matrices. |

## Phases of Data Analytics

There are two phases in which the data analytics fall; exploratory and confirmatory. The characteristics and the goal that is to be achieved through these analyses are different. The exploratory analysis phase isolates the features of the data and patterns and reveals it to the data analyst. In this phase, the data analyst extracts patterns that highlight irregularities in the dataset. The process may be repeated many times of the data analyst's choice if the required reasonable assurance is not revealed.

On contrary to this, confirmatory data analysis quantifies the extent to which deviations from a model could be expected to occur by chance. The confirmatory analysis

(1) The first and foremost challenge that

uses the traditional statistical tools of inference, significance, and confidence. Confirmatory analysis tests the statistical hypotheses.

## Benefits of using Data Analytics in audits

Among many benefits of using data analytics, some are: (1) while using any of the DA technique, the auditors can check a more significant number of auditing data then they do now, (2) the quality of audit can be increased by providing greater insights into auditees business processes, (3) fraud will be easier to detect because auditors can leverage tools and technology that they already use, (4) auditors can provide services and solve problems for their auditees that are beyond current capabilities by utilizing external data to inform audits, (5) the span of execution of the audit will also be shrunk once the soft data will be in hand.

Regarding the first benefit, one way DA can improve audits is by increasing the sufficiency (i.e., the appropriate amount) of audit evidence. Currently, auditors apply a risk-based model and sample transactions to determine that account balances are fairly stated. DA will allow auditors to automate the testing of transactions, and 100% of the population can be tested. Secondly, if the domain of the analysis is expanded and the proper checks are incorporated into the data, there is a greater possibility that the business process of the auditis understood by the auditor in a better way and the events such as frauds will be detected in a lot of ease.

Besides the above, the DA provides a lot more cushion in executing the audit cycle. Such as DA can contribute to every phase of the audit:

- to pre-engage activities such as deciding whether to accept or continue an engagement;
- to conduct audit planning;
- to understand the entity, environment and assessing the risks of a material misstatement by sneaking through in the business processes of the auditee organization;
- to evaluate the design and implementation and testing the operating effectiveness of internal controls;
- to substantial testing, both analytical procedures and tests of details; and
- to conclude and report.

Moreover, DA is relevant and has the potential to significantly improve audit procedures throughout the audit; such as, by using the DA, identifying and assessing fraud risk would be a lot easier as the auditor would have access to all the relevant data and not just sampling. Secondly, performing external confirmation procedures, especially the identification of high-risk items for confirmation. Thirdly, obtaining evidence about the valuation of investments, the existence and condition of inventory, and completeness of litigation, claims, and assessments and evaluating whether there is substantial doubt about the entity's ability to continue as a going concern.

## Challenges of Data Analytics

Since data analytics is still a new phenomenon in auditing, therefore, it is facing huge impediments. The challenges can

be categorized mainly into three broad areas.

(1) The first and foremost challenge that data analytics faces is the shortage of human resources in the SAIs. The number of trained data analysts or data scientists are few in numbers. Large data sets having a significant amount of transactions of which may be non-financial, can overwhelm the information processing capabilities of traditional auditors. Skills such as pattern recognition and understanding of evaluating the anomalies through Computer Assisted Audit Techniques (CAAT) have traditionally not been the main focus of formal auditor's education or training. Typically, these skills are gained through experiences in the field or being a part of audits comprised of data analytics.

(2) Secondly, data availability, relevance, and integrity is another impediment in the way of data analytics. It has been seen that most of the auditee organizations are unable to capture data in a manner that is useful to the auditor. There are also cases in which the auditee has provided the data containing the unwanted noise. Currently, auditee organizations, especially in Pakistan, are reluctant to provide direct access to their databases to auditors. Thus, the soft data availability is in question in the case of Pakistan

The third major challenge involves how data analytics is viewed by different stakeholders. Over the years, the auditing profession has dealt with an expectations gap regarding what outsiders expect of the auditor versus what standards require auditors to deliver. The gap in expectations occurs when users of the audit report believe that auditors are providing 100% assurance that financial statements are fairly stated, while in reality, auditors are only providing a reasonable level of assurance; which, due to sampling of transactions on a test basis, is somewhat less than 100%. Given the potential to audit 100% of transactions, it is possible that data analytics could aggravate the expectations gap issue because users would be even more likely to require 100% assurance. For example; in present, the auditors may have a defense for not revealing anomaly if they have a sample happens to be free of the anomalies/frauds. However, actually, the anomaly exists in the whole data. With the capacity to audit 100% data or transactions, the defense for auditors might not work because they are traversing and auditing every transaction. Hence, the audit report users will expect the auditor to uncover every possible anomaly, which is not possible practically.

## References

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