

Audit Data Analytics Alert

AUDIT DATA ANALYTICS

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Talking to Your Audit Clients About Data Analytics

Purpose of This Publication

A recent survey of Canadian audit practitioners and its related research paper show that a significant number of companies in Canada expect their external auditors (herein, auditors) to use audit data analytics (ADAs), regardless of the size of the audit firm. Further, they show that auditors perceive a significant positive relationship between the auditor's use of ADAs and confidence in the auditor's opinion. In addition, in the view of the researchers, public accounting firms that manage to stay on top of the current implementation and use of ADAs are well positioned to make the transition to the application of ADAs to Big Data.¹ These firms will then be able to move to the next wave of ADAs based on data generated from the Internet of Things (IoT).² Firms left behind during the ADA implementation are more likely to see their situation deteriorate further with each new wave of emerging technologies. Therefore, there is a pressing need for accounting firms to develop and implement a long-term ADA adoption and use strategy that will allow them to continue with the next generation of analytics using Big Data and prepare for the use of analytics related to the IoT.³

1 Big Data is high-volume, high-velocity and/or high-variety information assets that demand cost-effective innovative forms of information processing that enable enhanced insight, decision making, and process automation. (www.gartner.com/it-glossary/big-data)

2 The Internet of Things (IoT) is the network of physical objects that contain embedded technology to communicate and sense or interact with their internal states or the external environment. (www.gartner.com/it-glossary/?s=Internet+of+Things)

3 Hampton, Clark and Stratopoulos, Theophanis C., Audit Data Analytics Use: An Exploratory Analysis (November 29, 2016). Available at SSRN: <https://ssrn.com/abstract=2877358>

This publication is intended to help chartered professional accountants (CPAs) initiate productive dialogue with their audit clients on how to make more use of ADAs in their audits of financial statements.⁴ The American Institute of Certified Public Accountants (AICPA) has defined audit data analytics 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.⁵

There is a companion piece to this publication directed at audit clients (in particular, CFOs): “*Why CFOs Should Support the Use of Data Analytics in the Audit of Their Financial Statements.*” It contains questions a CFO may ask the company’s auditor related to ADAs. For ease of reference, these questions are set out in the Appendix attached to this *Alert*.

The CPA Canada Audit Data Analytics Committee (Committee) believes that increased use of ADAs is an important initial step in helping external auditors respond to an evolving audit environment characterized by a pervasive use of increasingly sophisticated information technology (IT). Advances in IT are enabling entities of all types and sizes to use vast amounts of internal and external data efficiently and effectively to improve their strategic, financial and operational decision making.

So how should external auditors respond to this changing environment? It seems reasonable for most audit clients to expect their auditors to increase their use of IT, including ADAs. Auditors’ use of ADAs falls across a broad spectrum: some make extensive use of ADAs at a sophisticated level; others currently use them little or not at all. This latter group is the primary target of this publication. Examples of key topics to discuss with audit clients include:

- benefits of integrating ADAs into the financial statement audit
- data availability and data capture
- other implications of greater use of ADAs for both the client and the auditor.

In the view of the Committee, such dialogue could be an important part of the overall effort by the external auditing profession to not only maintain but also enhance the relevance and value of the financial statement audit in this changing environment.

Set out below are matters useful for an audit engagement partner to cover with clients when being proactive in pursuing possible expanded use of ADAs.

4 CPA Canada’s Audit Data Analytics Alert (www.cpacanada.ca/en/business-and-accounting-resources/audit-and-assurance/canadian-auditing-standards-cas/publications/audit-data-analytics-alert-pace-of-change) provides information on issues related to use of data analytics by external auditors.

5 American Institute of Certified Public Accountants, Inc., Audit Analytics and Continuous Audit, Looking Toward the Future. (New York: AICPA, 2015), pp 92-93. www.aicpa.org/interestareas/frc/assuranceadvisoryservices/downloadabledocuments/auditanalytics_lookingtowardfuture.pdf
This definition originally appeared in the AICPA White Paper “Reimagining Auditing in a Wired World”, August 2014, authored by Paul Byrnes, Tom Criste, Trevor Stewart and Miklos Vasarhelyi. www.aicpa.org/InterestAreas/FRC/AssuranceAdvisoryServices/DownloadableDocuments/Whitepaper_Blue_Sky_Scenario-Pinkbook.pdf

Questions About ADAs the Auditor Should Discuss with Clients

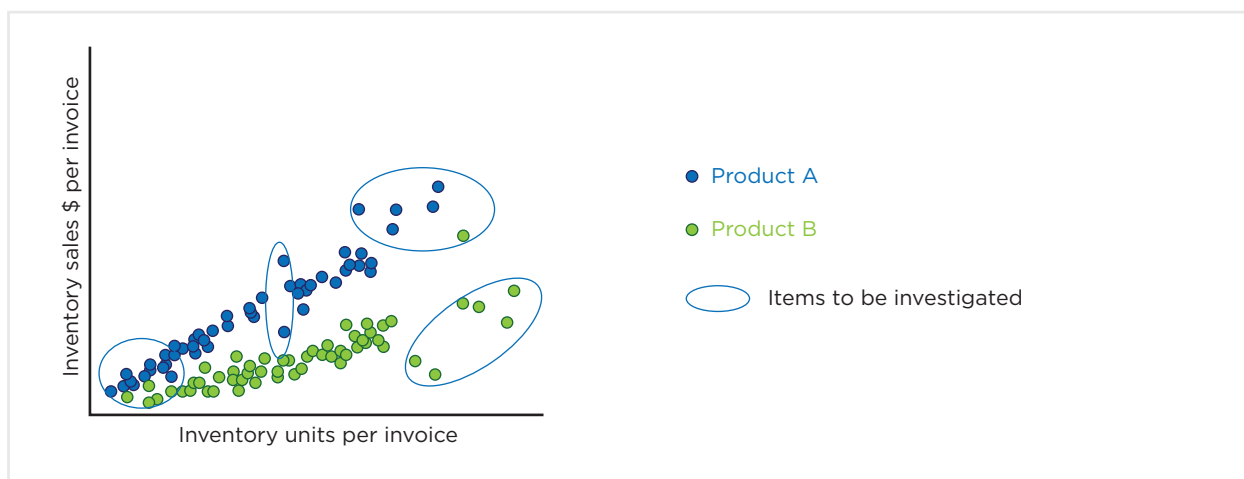
What Are ADAs?

ADAs are audit procedures used to discover and analyze patterns, identify anomalies, and obtain other useful information from data populations relevant to the audit. Because of the power of advanced analytical tools, auditors using ADAs are able to perform procedures that may, in some cases, cover 100% of the items in large data populations.⁶ The software used will typically generate graphics or tables to enable the auditor to readily see matters that require further investigation or other audit work. Such software may include, for example, business spreadsheet or visualization software, or software specifically designed for use in auditing.

The following are examples of ADAs:

Pattern analysis (e.g., data mining, trend analysis, regression analysis): The auditor analyzes various types of data (e.g., time series, cross-sectional, or cross-sectional time series (panel) data) to identify unusual patterns that may indicate, for example, a higher risk of material misstatement. Use of ADAs enables the auditor to examine extensive data sets spanning longer periods of time and at more disaggregated levels to improve the likelihood of identifying items of interest to the auditor.

An example is depicted in the graphic below. A company sells two main products, A and B. The sales prices were expected to be stable during the period under audit. Each dot on the graph represents an invoice, with its position determined by sales dollars and sales units from the invoice. Most invoices should appear on a straight line (i.e., the pattern expected), with the slope for the higher-priced product (product A) being steeper. Those invoices significantly above the straight line may represent overbillings; those significantly below the straight line may represent underbillings. The ADA links each invoice to underlying data to help enable efficient and effective follow-up audit work on items to be investigated. Even though the graphic shown is simplified, the ADA could also be used to analyze very large invoice populations.



⁶ Because of the inherent limitations of any audit, the auditor obtains a high, but not absolute, level of assurance that financial statements are not materially misstated. Examining 100% of items in a population does not enable the auditor to obtain absolute assurance that there is no material misstatement in that population.

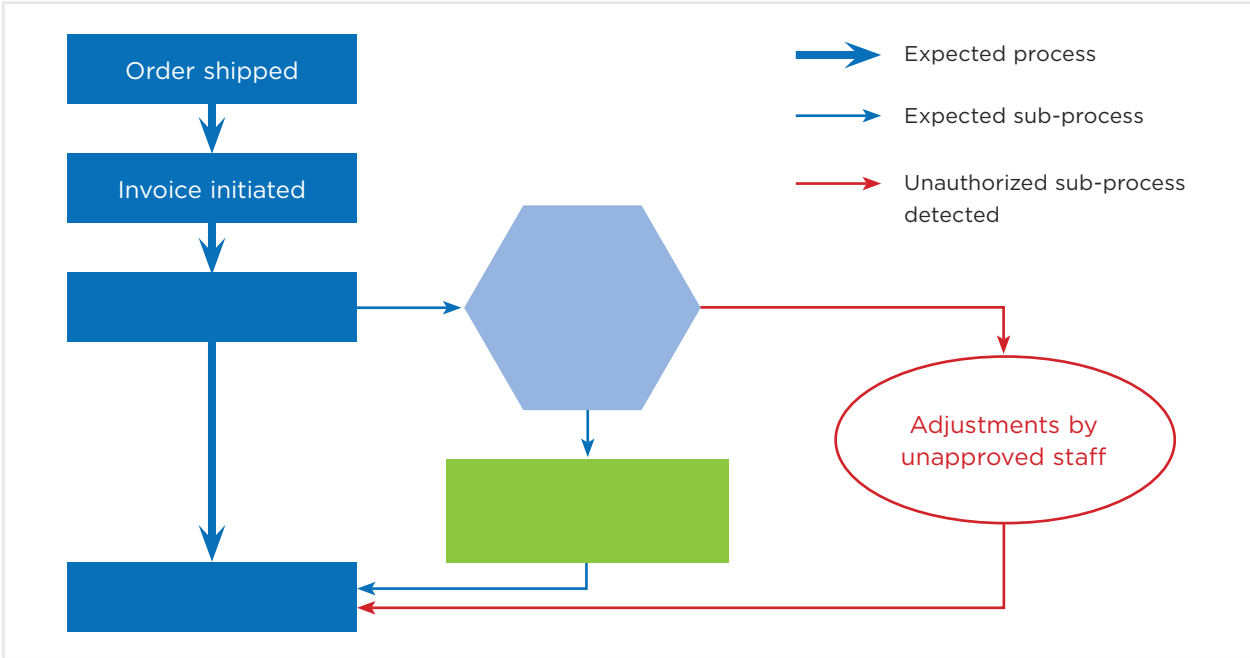
Peer analysis: The auditor compares or benchmarks key performance measures of the entity with those of entities in the same industry or otherwise comparable. This may be done for a period of time or as at a point in time. Use of IT enables broader and deeper analyses than would be practicable manually.

Three-way match procedure: The auditor compares key common fields in documents issued or received during the period under audit (e.g., quantities, prices and product identifiers in customer purchase orders, sales invoices and shipping documents). A mismatch may be indicative of a problem (e.g., a control weakness). The matching procedure often encompasses 100% of the documents issued in the period, potentially providing more in-depth knowledge of control risks.

Journal entry analytic: The auditor examines attributes of up to 100% of journal entries made during the period under audit to reveal relationships and patterns in account codes affected, the person who authorized and posted the entries, and the timing and amounts of posted entries.

Segregation of duties analysis: The auditor accesses user identifier fields for various types of transactions for the period under audit to identify instances when the same individual performed incompatible functions. For example, the ADA could be applied to all sales transactions for the year to identify instances when the same individual executed sales order and delivery document processing and applied cash receipts.

Process mining: The auditor uses software to identify, for example, whether the audited entity's system is processing transactions in a manner that will achieve effective internal control. One approach is for the auditor to use event logs from the organization's enterprise resource planning (ERP) system to trace actions performed by the system (including those initiated by employees) for significant transaction streams. An example provided below demonstrates the detection of an unauthorized sub-process using process mining.



General ledger account reconciliation: The auditor uses software to verify, for example, that opening balances agree with ending audited balances for the preceding period, that the closing balances for the current period equal opening balances plus or minus the current year's transactions and adjustments, that the general ledger is in balance and that balances in the control accounts in the general ledger are in agreement with those in the relevant subledgers.

General ledger account balance analysis: The auditor uses software to identify significant changes in account balances from prior periods, trends in balances, and to calculate key performance indicators. The software used typically generates graphics to enable the auditor to readily identify matters that likely warrant exploration.

Why Increase Use of ADAs?

More extensive use of ADAs is likely to result in benefits for both the client and the auditor, as explained under the next question. The possibility of the auditor making more extensive use of ADAs is likely to resonate most with clients who are effectively using IT to generate more robust information for their own decision making. For example, those clients are likely to want to leverage their data more effectively and to obtain maximum payback for their significant investment in IT, including the prospect of making the financial statement audit more efficient and effective.

However, this dialogue may be even more important to audit clients who are not keeping pace with changes in IT. This may represent a significant opportunity for both the auditor and the client to respond to changes in the environment and to help ensure that their respective objectives can be achieved going forward.

What Are Some Potential Benefits of Increased Use of ADAs?

A main objective of auditors who make use of ADAs is to improve audit quality. For example, some ADAs may allow the auditor to use more complex data models to increase the rigour of audit procedures. Their use may, for example, improve the auditor's ability to assess the risks of material misstatement in various accounts through analysis of up to 100% of relevant data for those accounts. But the auditor also provides a fresh, knowledgeable and objective set of eyes that may not always be available inside an organization. Use of ADAs may increase the breadth and depth of the auditor's knowledge of the organization and thereby provide a basis for more meaningful input to management, as an important by-product of the audit. Examples are set out below.

Deeper insights into an organization's systems and controls

A process mining ADA, for example, may be effective in identifying control deficiencies. The numbers and types of transaction flows may be quite different from what the organization intended. This type of ADA may also identify, for example, an unusual amount of manual intervention in automated processing or other matters that do not make sense, based on the auditor's knowledge of process flows in similar organizations. Such insights may be a valuable by-product of the financial statement audit.

Other ADAs, such as three-way matches and automated journal entry testing may also reveal system inefficiencies (e.g., overuse of manual procedures) of interest to management.

More robust performance information to supplement that obtained by management

One of the auditor's main objectives in using pattern analysis is to improve assessments and responses to risks of material misstatement. However, these ADAs may also reveal matters important to the entity's operations or even to strategic decisions. For example, in auditing accounting estimates such as allowances for doubtful accounts, inventory obsolescence or warranty provisions, the use of ADAs by the auditor that have more breadth and depth may provide valuable information on many aspects of transaction flows. These could include product inflows and outflows, customer behaviours when purchasing, payments and returns of goods including (when available) comparisons to performance measures used by the organization's peers, which operate in a similar environment.

More effective and efficient interactions among auditors and finance staff

CFOs sometimes express concern about the amount of time finance staff have to spend dealing with questions from auditors. More extensive use of ADAs may improve the relevance and specificity of questions asked by the auditor. Further, rather than focusing on what happened, audit questions may often focus more productively on why a significant matter has arisen, and its consequences. Reasons why ADAs may result in higher-quality dialogue include the following:

- ADAs may often be developed in consultation with the organization's IT department to define the types of information and reports needed. These consultations often result in more consistent data requests from year to year and fewer follow-up requests for reports from the finance team.
- Expectations, including what types of anomalies to expect, will typically be clearly defined in advance.
- Management and auditors are more likely to be talking the same language and be on the same page when discussing audit matters. However, they are also likely to bring somewhat different perspectives to the table, which is useful. Management will have its own in-depth knowledge of operations based in part on performing its own data analytics. The auditor's perspective will be objective and based on experience with other entities and informed by a knowledge of processes and controls that may not be available to the organization internally. The breadth and depth of information that may be available to the auditor through use of data analytics will often make the discussions with management and related outcomes more robust.
- As the auditor explores further and expands use of ADAs, requests may be made to management to provide data regarding matters relevant to both management and the auditor, for which the existing data sets are incomplete or otherwise of poor quality. Over time, management may decide that there is merit in closing these data gaps. The availability of better-quality data may help enable the organization to improve its own data analytics and performance reporting.

Does Using ADAs Have Ramifications for Auditor Independence?

Auditors may be asked this question because they are providing insights to management from the ADAs. Auditors are required by Canadian Auditing Standards and applicable rules of professional conduct to maintain independence of mind and independence in appearance. Independence of mind allows the auditor to act with integrity and exercise objectivity and professional skepticism. Independence in appearance means that the auditor avoids facts and circumstances that would lead an informed third party to conclude the auditor's independence has been impaired. Providing input to clients is consistent with the auditor's role and does not necessarily impair independence. The auditor's objectivity and independence are not impaired by providing more useful commentary on management's controls and risk management processes. This is specifically acknowledged in rules of professional conduct governing chartered professional accountants, as follows:

Obtaining an understanding of the client's internal controls is required by generally accepted auditing standards. Members often become involved in diagnosing, assessing and recommending to management ways in which internal controls can be improved or strengthened. Notwithstanding Rule 204.4(22) the independence of a member or firm would not be impaired by the provision of services to assess the effectiveness of the internal controls of an assurance client or a related entity and to recommend improvements in the design and implementation of internal controls and risk management control.⁷

Would the Audit Approach Need to Change Significantly?

No. Currently, the approach to the audit would not have to fundamentally change. For example, use of ADAs would not result in a need to rely on the effective operation of controls relevant to the audit in designing substantive procedures when that was not the approach taken in prior years. The auditor would still need to determine an appropriate approach to ensure the completeness and accuracy of the information used in the ADAs. ADAs can be effectively used in any phase of the audit (i.e., initial planning, risk assessment, assessment of the design and operating effectiveness of controls, substantive procedures and in forming an overall conclusion for the audit). More use of ADAs would be made when that would result in a more effective or efficient audit. CPA Canada (in collaboration with the AICPA) is developing a non-authoritative audit guide on the use of audit data analytics. It is scheduled to be published in 2017.⁸

What Training Would Be Required? Would the Composition of the Engagement Team Need to Change?

The research study referred to in the opening paragraph of this publication also obtained perceptions from auditors regarding training. The study found that management of accounting firms are motivated by clients' expectations of their auditors to use ADAs, which in turn motivates accounting firms to provide training opportunities to its staff and leads to increased use of ADAs. Training might, for example, focus on developing ADA expertise,

7 Rule 204: Harmonized rule of professional conduct — Independence (June 2016), Rule 204.4(22) to (24), Guidance — Paragraph 1 www.cpacanada.ca/en/the-cpa-profession/cpas-and-what-we-do/what-cpas-do/professional-conduct-auditor-independence-rule-204/rule-204-harmonized-standards

8 The AICPA is going to publish this guide as authoritative guidance.

including how to apply various tools and techniques developed or acquired by the accounting firm. The survey found that auditors perceive that developing ADA expertise is more productive than developing ADA tool diversity, but that there are cost trade-offs to be considered.

In the transition period when initial use of ADAs is being made, there may be more involvement of IT specialists if problems are encountered regarding the interaction of the auditor's software and the entity's systems. However, it is expected that the extent of specialist involvement would be reduced over time as non-specialist members of the engagement team gain more knowledge and experience in the use of ADAs.

What About Protecting the Integrity and Security of Client Data?

The accounting firm should have a robust process and controls in place to maintain the integrity and security of the data accessed from the client's systems, including any personal identifiable information required for purposes of the audit. The auditor's software should be designed to read and, in some cases, extract data, not alter the data. Regarding storing extracted data in audit files, the audit firm should, for example, restrict physical access to the auditor's hardware containing the audit documentation (including the client's data) and restrict remote access to authorized users only.

The use of data analytics is a journey to be undertaken by both management and auditor. It is important to have open lines of communication and discuss ways ADAs can benefit management as well as the auditor. For more information on ADAs, please refer to [CPA Canada's Audit Data Analytics Committee webpage](#).

Additional Resources

- [CPA Canada Audit Data Analytics Committee Landing Page](#)
- CPA Canada Publication — [Audit Client Briefing: Why CFOs Should Support the Use of Data Analytics in the Audit of Their Financial Statements](#)
- CPA Canada Publication — [Audit Data Analytics Alert: Keeping Up with the Pace of Change](#)
- CPA Canada Webinar — [Business Analytics Part 1: An Introduction to Analytical Thinking](#)
- CPA Canada Webinar — [Business Analytics Part 2: Implementing Analytics in Your Organization](#)
- CPA Canada Webinar — [New Insights, New Models: The Power of Big Data and Analytics](#)
- AICPA [Audit Data Standards](#) — Voluntary, recommended data standards for the extraction of information. These data extract standards do not represent authoritative auditing or accounting standards.
- AICPA Publication—[Audit Analytics and Continuous Audit: Looking Toward the Future](#)

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Appendix

Sample Questions for Auditors, included in [CPA Canada Audit Client Briefing “Why CFOs Should Support the Use of Data Analytics in the Audit of Their Financial Statements”](#)

Sample Questions CFOs May Ask Auditors About Data Analytics

Can Your Auditors Use ADAs to Give You, the CFO, More Value from Your Audit?

Auditors’ use of ADAs falls across a broad spectrum: some make extensive use of ADAs at a sophisticated level; others use them little or not at all. As a result, answers received to this question may vary significantly.

For auditors already making use of ADAs at a sophisticated level, the dialogue may focus on opportunities to go even further. The emphasis will be on continuing to improve audit quality and also on considering ways to provide even more and better insights to management as a result of the audit. This may be accomplished, for example, by capturing and analyzing new types of useful data, or looking at data in new ways.

For auditors making little, if any, use of ADAs, there will be significant opportunities to move forward. The dialogue in this case may focus on an implementation plan for appropriately integrating more ADAs into the audit over time, with the co-operation of management of the organization, particularly its finance and IT departments. Examples of low-hanging fruit, when contemplating integration of ADAs into your audits, might include procedures such as automated journal entry analysis and three-way matching of information in documents in key business processes. These types of ADAs may be relatively easy to implement but have the potential for substantial payback in terms of both audit quality and valuable insights that can be provided to management.

How Could You, the CFO, Help Your Auditors Increase Their Use of ADAs?

In some cases, a key barrier to overcome is the accessibility of relevant data by the auditor. To overcome this barrier, the co-operation and support of key personnel within the organization, including in particular IT personnel, is needed. For example, there often may be technical complexities to be addressed before the auditor can obtain data in a format suitable for performing the audit. These relate, for example, to data file and data field definitions, and data validation routines needed to assess the data completeness and integrity. This can be more complex in cases where an organization uses many different legacy systems that vary significantly in the way data is captured, managed and reported.

An effective and efficient transition to an increased use of ADAs requires both management and auditors to be open to changing processes. These changes may include, for example, management responding positively to more specific or extensive requests by auditors for data and to the auditor's use of different data-access tools.

In addition, CFOs and IT personnel may want to know how the auditor will maintain the integrity, security, and confidentiality of the data to which the auditor is given access, including any personal identifiable information required for audit purposes.

These matters may be addressed by timely and effective dialogue among the CFO, IT personnel and the auditor. Issues can be clearly set out and specific steps agreed upon to address them.

What About Audit Time and Costs?

Increased use of ADAs will not necessarily result in increased time and costs of the audit. In part, time and costs will depend on the nature and extent of the transition required to increase the use of ADAs. Realistically, in the period of transition, there may be more time and costs required to implement the changes. The benefits of the changes to both management and auditors will, in most cases, be realized in subsequent years.

Specific steps can be taken to help control audit time and costs. For example, auditors may, in some cases, have to spend considerable time "cleaning" data (i.e., dealing with missing or inaccurate data) before it is in a usable format for audit purposes. It is in the interests of the organization to ensure its data is "clean" prior to the audit.

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