

cpab exchange

Technology in the audit

Technology is changing the audit. Audit platforms are becoming more automated. Auditors are increasingly using automated tools and techniques to perform risk assessment and further audit procedures.

The Canadian Public Accountability Board (CPAB) sees promise in the use of technology to elevate the quality of audits.

We provide our perspectives on how the use of technology is enhancing the quality of audits. We also describe the challenges that are emerging, as well as our expectations of audit firms, as the use of technology comes to represent a more significant component of the audit effort.

Our views are informed primarily by our audit oversight activities. We have also been engaging more formally with third-party service providers to better understand the technological resources they are licencing to audit firms. Finally, we value the insights we obtain about audit technology from our discussions with regulators and auditing standard setters in Canada and around the world.

IFIAR’s Technology Task Force

CPAB leads the International Forum of Independent Audit Regulators’ (IFIAR) Technology Task Force.

The mandate of the task force is to enhance the understanding of IFIAR members of how technological resources used by the six largest global audit firms are impacting audit quality. The task force is engaged in discussions with each firm’s global leaders to understand their network level approaches to oversight of technological resources used in audits across their networks.

Contents	Technological resources used in audits	Page 2
	The promise of technology	Page 3
	Practical opportunities	Page 4
	Navigating the auditing standards	Page 6
	Quality management	Page 9

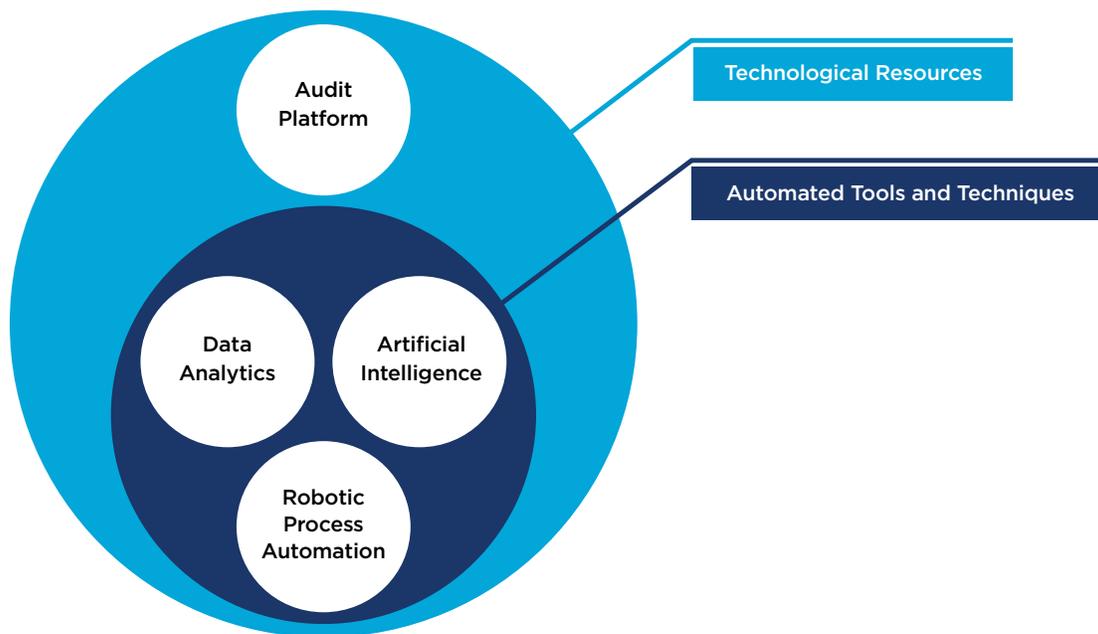
Technological resources used in audits

Technological resources¹ used in the performance of audits include:

1. IT applications used to prepare and compile audit documentation (i.e., the audit platform).
2. IT applications used for intellectual resources.
3. IT applications used as automated tools and techniques to perform audit procedures.

Audit platforms are becoming more automated. Some firms have embedded their intellectual resources (i.e., policies and procedures, ethical requirements, auditing alerts and methodologies, accounting, industry and subject-matter guides) into their audit platforms. Firms are also increasingly standardizing their audit workflows to enhance the consistency of audits. Automation of audit platforms is also allowing centralized monitoring of audits by assurance practice leaders of some firms.

Our focus in this publication is on the third category, automated tools and techniques (ATT). ATT are used by auditors to perform risk assessment procedures and/or further audit procedures (i.e., tests of controls and substantive procedures). ATT include data analytics (DA), artificial intelligence (AI) and robotic process automation (RPA)².



¹Technological resources is a sub-component of the resources component described in the International Standard on Quality Management 1 (ISQM 1), *Quality management for firms that perform audits or reviews of financial statements, or other assurance or related services engagements*. It includes, among other things, information technology (IT) applications used by engagement teams in the performance of engagements.

²Our definition of automated tools and techniques (ATT) was adapted from references to ATT in the application guidance in International Standard on Auditing (ISA) 315, *Identifying and Assessing the Risks of Material Misstatement* (Revised 2019) and other non-authoritative guidance developed by the International Auditing and Assurance Standards Board (IAASB).

The promise of technology

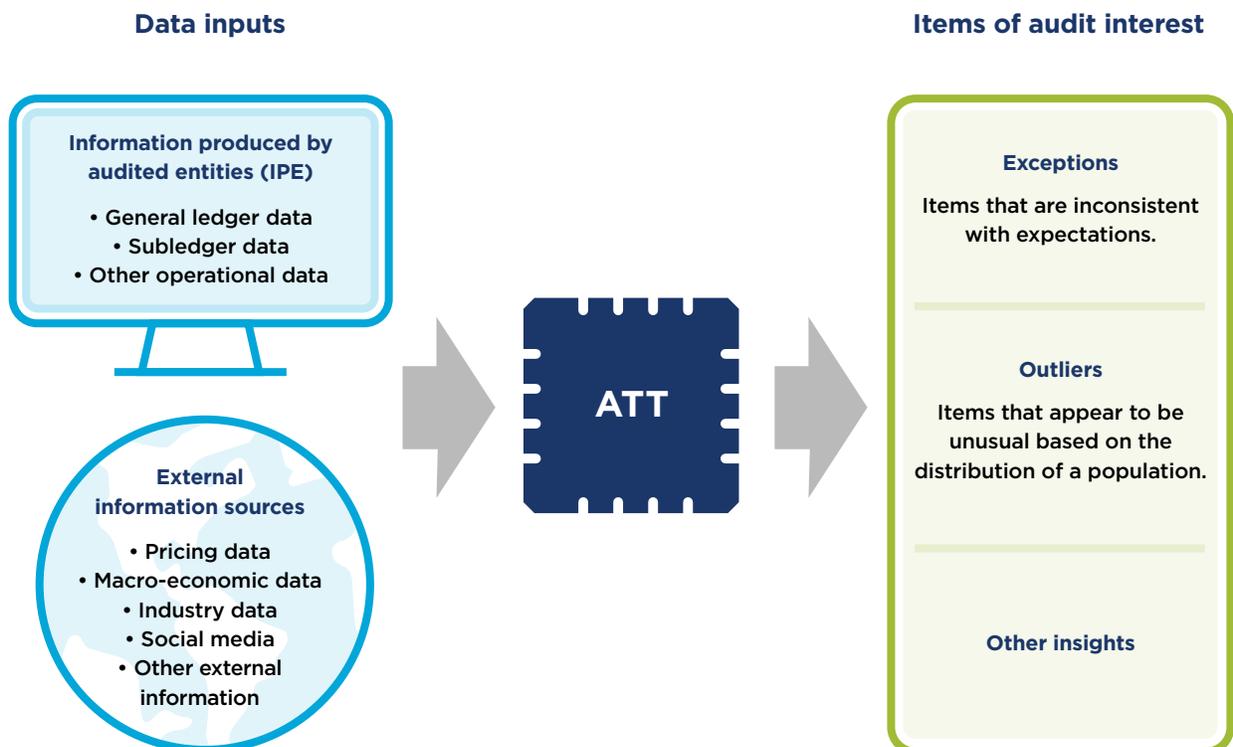
We see two significant opportunities for ATT to enhance the quality of audits. One has to do with auditors leveraging the computing power of ATT to analyze data sets. The other relates to the greater variety of relevant information, beyond entities' accounting records, that auditors can access and analyze with ATT.

Analyzing entire data sets

The use of ATT is allowing auditors to analyze large data sets (often entire populations) to obtain deeper insights, identify unusual trends and to more effectively challenge management's assertions, which enhances the ability of auditors to exercise professional skepticism. That is not to suggest that auditors are using ATT to test every item in a data set. Rather, the advantage of using ATT is that the output of the ATT becomes the auditor's sample of the population and not a randomly selected sample which may or may not contain items of audit interest³.

Beyond the entity's accounting records

Audited entities' accounting records remain the primary source of information used by auditors today. However, advancements in technology are making additional sources of relevant information more accessible, including information from both within and outside of audited entities. We anticipate that auditors will be capturing the utility of that information to enhance the persuasiveness of audit evidence they obtain in audits.



³ Auditors also evaluate whether risks of material misstatement in items of the data set that have not been identified as items of audit interest in the ATT's output. When risks are identified, auditors also perform additional testing on the remaining data set to address those risks.

Practical opportunities

We think it's useful to describe some practical examples of ATT that are being used by the firms to enhance the quality of audits.

For several years now, auditors have been using ATT to test the appropriateness of journal entries. More recently, auditors have been using ATT increasingly to perform risk assessment procedures and further audit procedures (i.e., tests of controls and substantive procedures).

Journal entry testing

Financial reporting fraud often involves management overriding internal controls to, for example, post fictitious journal entries. It has become relatively common for auditors to use ATT to filter the population of journal entries to identify entries that appear inappropriate or unusual. The filters (and the relative importance assigned to each filter) are determined by auditors based on their expectations of how fraudulent entries could arise for the audited entity (e.g., posted by senior management who seldom post journal entries, etc.).

Using ATT is more effective than visual inspection to identify journal entries of audit interest often among many thousands of entries. Importantly, however, ATT does not replace the need for auditors to exercise professional judgment. Neglecting to customize the ATT's filters to fit the unique circumstances of the audited entity will not help auditors detect fraudulent journal entries. Consequently, the auditor's fraud risk assessment continues to play an important role in the audit.

AI in the audit

We've also been monitoring the development of more sophisticated ATT designed to detect fraud in audits. The ATT use machine learning (an application of AI) to learn about how fraud can occur from experience accumulated across audits.

AI promises to enhance fraud detection. However, using AI also involves trade-offs, including reduced transparency about how the ATT is reaching its conclusions. These challenges need to be carefully managed by audit firms.

Risk assessment

An ATT that is being used more in audits is process mining⁴. This ATT helps auditors confirm their understanding of how transactions for an entity's cycles (e.g., sales, purchasing, payroll) flow through the entity's information system, including how they are initiated in the system and recorded in the general ledger⁵.

Consider, for example, the traditional risk assessment procedures that auditors perform for the purchase-to-pay (P2P) cycle. Auditors obtain an understanding of the expected path of P2P transactions through the information system by making inquiries of relevant personnel, inspecting policy or process manuals or performing a walk-through of one or more purchase-to-pay transactions. Some auditors are then using ATT to confirm the understanding they've obtained with their traditional risk assessment procedures.

⁴ This ATT is also referred to as process mapping or transaction mapping.

⁵ ISA 315 (Revised 2019), *Identifying and assessing risks of material misstatement*, paragraph A137.

Process mining can significantly enhance the quality of auditors' risk assessments. It gives auditors a more realistic understanding of how audited entities operate. Business processes seldom operate as uniformly or consistently as policy or process manuals may suggest. Continuing with our P2P example, auditors will often find legitimate reasons why transactions deviate from the path approved by management through the information system (e.g., emergency purchases from one-off vendors, etc.). However, variations to approved or expected paths may also be indicative of deficiencies in the design of an entity's internal controls and of risks of material misstatement due to error or fraud.

Substantive procedures

An example of ATT that auditors are using to substantively test revenue is called the three-way match⁶. The ATT matches attributes (e.g., dates, quantities, prices, etc.) for sales transactions recorded during the period to customer orders, shipping documents and invoices (or shipping documents, invoices and cash receipts). Attributes that don't match with supporting accounting records are regarded as exceptions and are further investigated by auditors to determine whether they are misstatements (e.g., revenue recorded prematurely, recorded amounts are inaccurate, etc.).

The three-way match routine can be quite effective at detecting errors for less complex revenue arrangements for which the timing of revenue recognition coincides with when goods are shipped to customers. It does not, however, replace the need for auditors to exercise professional skepticism. For example, auditors will need to consider whether the three-way match is adequately responding to assessed fraud risks and whether additional targeted procedures are required. Auditors may assess, for example, an elevated fraud risk that supporting accounting records used in the three-way match may be altered by management to manipulate financial results. That would require auditors to design and perform incremental audit procedures to respond specifically to the fraud risk when they test the reliability of data inputs used in their ATT.

Tests of controls

Auditors are also using ATT to analyze how some of the more complex enterprise resource planning (ERP) systems used by entities are configured, including security configurations, and how those configurations changed over the period under audit. This is helping auditors understand and test general IT controls (GITCs) that mitigate risks for the following IT processes: managing access, managing program changes and managing IT operations.

The use of this ATT can enhance the quality of GITCs testing. Auditors have traditionally relied on their own technical understanding and the assistance of the audited entity's personnel to review the configurations of an ERP system that are of interest in the audit. In contrast, the use of ATT designed specifically to analyze specified ERP systems allows firms to standardize the procedures that auditors perform and to interact more independently with the ERP system. We believe this helps auditors obtain more persuasive audit evidence.

⁶ Auditors are also using the three-way match ATT to perform risk assessment procedures.

Navigating the auditing standards

The growing use of technology in audits is giving rise to some questions that are not well addressed by the current auditing standards. This is contributing to the diversity CPAB is seeing in audit work in the following areas:

1. Testing the data inputs into ATT.
2. Testing the output of an ATT.

Data inputs

A data-driven audit can significantly enhance audit quality. That involves auditors using ATT to obtain insights from data that deserve their attention and that drive their testing. However, insufficient testing of the data which powers the approach undermines audit quality.

The auditing standards⁷ require auditors to evaluate whether information used in their audits (i.e., data inputs), including information produced by entities (IPE) and information from external sources, is relevant and reliable. An additional requirement for IPE is that auditors also evaluate whether the information is sufficiently reliable for their purposes, including as necessary in the circumstances:

- Obtaining evidence about the accuracy and completeness of the information, and
- Evaluating whether the information is sufficiently precise and detailed for the auditor's purposes.

The growing use of technology and the evolving nature and sources of information used in audits are raising questions about how to apply these requirements in current practice. These questions are being considered by the International Auditing and Assurance Board (IAASB) as they endeavour to revise ISA 500, *Audit Evidence*. However, a revised standard is not expected until June 2023 and we are concerned about the quality of testing in this area while revisions to ISA 500 are being considered.

We describe next some matters that we expect auditors to be considering when testing the reliability of data inputs in ATT used to perform substantive procedures and ATT used in risk assessment procedures.

Reliability of IPE inputs in ATT used to perform substantive procedures

When auditors use ATT to perform substantive procedures, the testing they perform on the data inputs (e.g., IPE and external information) will, in some cases, be the only testing they perform on the underlying data. That could happen, for example, when the ATT's output does not identify items in the population that deserve further investigation by auditors. It is important for auditors to be satisfied that the data they are using in their ATT is reliable (i.e., accurate, complete and valid⁸).

Auditors typically use one or both of the following two approaches to test the reliability of IPE information inputs in their ATT used to perform substantive testing procedures:

- A direct testing approach which involves agreeing details for a sample of items in the IPE data set to supporting documentation to conclude on whether the data set is accurate, complete and valid. The approach does not require auditors to evaluate the risks associated with the reliability of the IPE and accordingly, the nature and extent of work performed is unrelated to the perceived reliability of the IPE.
- Testing internal controls associated with the accuracy, completeness and validity of the IPE.

⁷ ISA 500, *Audit Evidence*, paragraphs 7 and 9.

⁸ The IAASB is considering which attributes are the most relevant to auditors when testing the reliability of information intended to be used as audit evidence (i.e., data inputs) as part of its project to revise ISA 500.

We are concerned that auditors are often defaulting to a direct testing approach to test IPE inputs in their ATT particularly because direct testing alone will not be sufficient in some cases. The auditing standards require auditors to perform a spectrum of work based on their assessment of the reliability of the IPE and whether the IPE is sufficiently reliable for their purposes.

Consider, for example, an IPE data set that consists of details of sales transactions obtained from an entity's subledger to be used as inputs in ATT to perform tests of details on revenue. Revenue is often a significant class of transactions and auditors are required to understand how the transactions are processed and maintained in the entity's information system as part of their risk assessment procedures. If significant risks are identified associated with the sales transactions, auditors are required to obtain an understanding (i.e., design and implementation) of relevant internal controls, including GITCs that mitigate risks arising from the entity's use of IT for applicable IT applications⁹. Finally, auditors are also required to understand and test relevant controls (i.e., operating effectiveness) when substantive tests alone, performed with the ATT and/or traditional audit techniques, are not expected to provide sufficient appropriate audit evidence¹⁰.

Reliability of data inputs in ATT used to perform risk assessment procedures

Auditors are increasingly using ATT to support their assessments of assertion-level risks of material misstatement for significant classes of transactions and account balances. Accordingly, ATT are helping auditors determine where to focus their further audit procedures (i.e., tests of controls and substantive procedures).

Audit firms are interpreting the required work effort to test the reliability of data inputs in ATT used to perform risk assessment procedures differently.

In our view, the work effort should depend on the significance of the ATT to auditors' assessed risks of material misstatement. As the significance of the ATT used to support assessed risks increases, so too should the work effort that auditors perform to test the data inputs. Consider an auditor that is using a risk assessment ATT as a primary source of evidence to inform their conclusions that the assertion-level risks of material misstatement for a revenue stream fall on the low end of the inherent risk spectrum. We would expect a significant work effort to test the data inputs because of the high level of significance of the ATT to the auditor's conclusions about assertion-level risks associated with that revenue stream.

Output

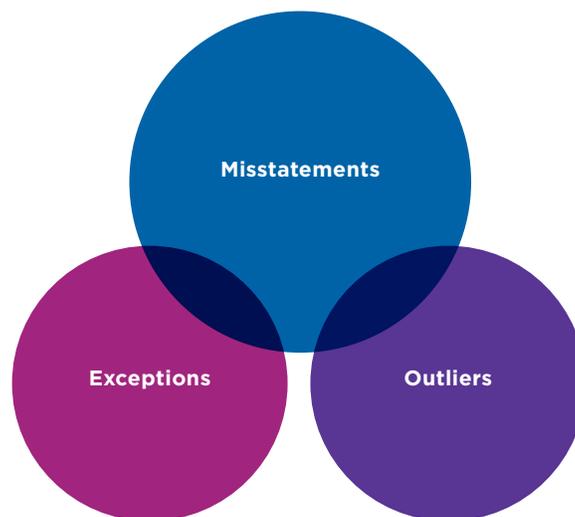
Another area that is not well addressed in the auditing standards is the work effort required to test exceptions and outliers identified by ATT.

Exceptions are items in the population that are inconsistent with the auditor's expectations. For example, a three-way match ATT may identify sales transactions that don't have matching shipping documents. Outliers, on the other hand, are items identified by the ATT that exhibit characteristics that are unusual based on the distribution of the population. For example, an ATT might identify the growth in sales for a retail store (same-store sales) as unusual when compared to an entity's other stores in a particular location.

⁹ ISA 315 (Revised 2019), *Identifying and assessing the risks of material misstatement*, paragraphs 25 and 26.

¹⁰ ISA 330, *The auditor's responses to assessed risks*, paragraphs 8 (b) and A24.

Not all exceptions or outliers identified by an ATT represent misstatements of the financial statements. Continuing with our example, the auditor may determine upon further investigation that the same-store sales for the store is well supported by audit evidence. Importantly, however, all exceptions or outliers could potentially represent misstatements in the financial statements and accordingly warrant further investigation by auditors. In our view, further investigation is required regardless of whether the exceptions/outliers are identified by ATT used to perform substantive procedures or risk assessment procedures. That's because the nature of the ATT is not relevant when the output of an ATT indicates the existence of potential misstatements that may be material, individually or in aggregate, to users of the financial statements.



Auditors will often be able to reduce the number of exceptions/outliers by adjusting the expected outcomes in their ATT to better reflect the specific circumstances of the audited entity. For example, auditors may determine that entries posted on weekends (a popular pre-set filter applied when testing the appropriateness of journal entries) are not in fact exceptions because the entity's finance staff work on weekends.

For the remaining population of exceptions/outliers, it is not appropriate for auditors to apply a sampling approach to test that population unless they are able to disaggregate the population (of exceptions/outliers) into homogenous clusters. Specifically:

- When clustering is possible, auditors should support their conclusions that the exceptions or outliers in each cluster share the same characteristics (i.e., identified as exceptions or outliers for the same reasons) which, in turn, justifies a sampling approach to test each cluster.
- When clustering is not possible, auditors should investigate all exceptions/outliers until the monetary impact of the untested population of exceptions/outliers is reduced to an amount that is below the auditor's tolerable misstatement threshold.

Quality management

Firms that develop or obtain ATT to be used in performance of audits have quality control policies and procedures that respond to the following two quality risks:

1. ATT are not designed and/or operating appropriately to meet their intended purposes.
2. ATT are not being used appropriately by engagement teams.

The first risk is primarily managed at the firm level with processes to approve ATT (referred to as certification processes) before they are rolled out and used by engagement teams. In 2019, CPAB began adding a review of certification processes to our annual assessments of the larger firms' quality control processes. The larger firms are generally developing their own ATT, although some of their ATT are obtained from third-party service providers (service providers), while other firms are generally obtaining their ATT from service providers.

The second risk is primarily managed at the engagement level by audit partners. The firms are then monitoring that ATT are being used appropriately in their inspections of completed audits.

We describe next some of the expectations that guide CPAB's regulatory assessments of the firms associated with ATT quality management practices (e.g., development, attainment, maintenance, use, etc.). Our expectations are also informed by the new quality management standards which become effective on December 15, 2022, including ISQM 1 which applies at the firm level, and ISA 220 which applies at the engagement level¹¹.

Appropriate design/operation of ATT

ATT are growing in sophistication and their relative contribution to the audit effort is also growing. CPAB will be focused increasingly on evaluating the adequacy of risk assessment processes at the firms related to the development or attainment of appropriate ATT.

ISQM 1 requires firms to establish the quality objective described to the right. We also expect firms to establish sub-objectives¹² to enhance their identification and assessment of quality risks, and design and implementation of responses. Sub-objectives will be unique to each firm based on their own circumstances.

Quality objective

Appropriate ATT are developed or obtained, implemented, maintained and used to enable the performance of audits.

(Adapted from ISQM 1, paragraph 32f.)

For firms that permit engagement teams to develop or obtain their own ATT (including, for example, complex macros in Microsoft Excel¹³), they should establish a sub-objective dealing with why that is desirable. When accountability is left to engagement teams to perform what is essentially their own certification processes, firms should have policies or procedures, similar to those followed at the firm level, that engagement teams are required to follow before the ATT can be used in audits. That includes, for example, policies or procedures for determining whether the ATT operates as designed and achieves the purpose for which it is intended¹⁴. Firms should then monitor that engagement teams are appropriately following those policies and procedures as part of each firm's monitoring activities.

¹¹The new quality management standards are:

- International Standard on Quality Management (ISQM) 1, *Quality Management for Firms that Perform Audits or Reviews of Financial Statements, or Other Assurance or Related Services Engagements*.
- ISQM 2, *Engagement Quality Reviews*.
- ISA 220 (Revised), *Quality Management for an Audit of Financial Statements*.

¹²ISQM 1, paragraphs 24 and A44.

¹³The IAASB's ISQM 1 [First-Time Implementation Guide](#) refers to Excel and macros in Excel as ATT (p. 49).

¹⁴See ISQM 1, paragraph A100 for other items that policies or procedures would require engagement teams to determine when certifying their own ATT.

We also expect firms that develop or obtain more complex ATT, including ATT that leverage AI algorithms, to have related sub-objectives. For example, some firms are developing ATT that leverage neural networks. Neural networks typically rank high on the performance scale (e.g., perform well in predicting outcomes) but low on the explainability scale because it is *hard to explain* in human terms how a neural network is arriving at its conclusions. Firms should consider how they will respond to the explainability risk, including how they will test and document (i.e., explain) whether the ATT are achieving their intended purposes.

Service providers

When ATT are obtained from service providers, firms remain responsible for ensuring the ATT are appropriate for use in the performance of audits. Quality risks will depend on, among other things, the complexity of the ATT obtained from service providers and how significant the ATT are to the audit effort.

Quality objective

ATT obtained from service providers are appropriate for use in the performance of audit engagements.

(Adapted from ISQM 1, paragraph 32h).

We understand that service providers are sometimes reluctant to share sensitive information about their ATT (e.g., the ATT source code, etc.) to protect their intellectual property which is, in turn, creating challenges for firms when evaluating whether the ATT are fit-for-purpose. Guidance from the IAASB describes that when the service provider does not provide the information needed by the firm, and the firm is unable to obtain alternative information to satisfy themselves that the service provider is appropriate for the performance of engagements, the firm may need to use an alternative service provider¹⁵. Our expectation is that firms will obtain enough information, and/or perform enough testing of the ATT, to reasonably conclude that ATT obtained from service providers are designed and operating appropriately for their intended purposes.

Appropriate use of ATT

Engagement partners are ultimately responsible and accountable for determining whether to use ATT in audits and that the ATT are used appropriately by engagement teams. Firms are responsible and accountable for providing the infrastructure to support the appropriate use of ATT including procedural manuals, training, and specialist resources and support.

We believe that the appropriate use of ATT in audits is a shared responsibility between firm leadership and engagement partners. Responses that address the related quality risks should operate at both the firm and engagement levels. An example of a combined response¹⁶ for firms is to establish policies and procedures that describe the circumstances when engagement teams should undertake consultations with suitably qualified specialists to, for example, interpret the output of a complex ATT.

¹⁵ The IAASB's ISQM 1 [First-Time Implementation Guide](#), p. 53.

¹⁶ ISQM 1, paragraphs 26 and A50.

We want to hear from you

An objective of this publication is to serve as the foundation for ongoing discussions with audit firms, auditing standard setters and other regulators.

We would like to hear from you. Please send your comments or questions to thoughtleadership@cpab-ccrc.ca.

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