

Data and Technology Research Project Update

SPOTLIGHT

Overview

Advancements in technology are affecting the nature, timing, preparation, and use of financial information. Some audit firms are making significant investments in personnel and other resources to expand their use of technology-based audit tools, including software used to perform data analytics (technology-based tools), to plan and perform audits. In light of the increasing use of technology by auditors and preparers, the Board's strategic plan highlights that we must anticipate and respond to these innovations and their corresponding opportunities and risks. The PCAOB's Office of the Chief Auditor established a [research project on data and technology](#) to assess whether there is a need for guidance, changes to PCAOB standards, or other regulatory actions.

As part of assessing whether regulatory action is necessary in response to the evolving audit landscape, we have gathered information from PCAOB oversight activities, reviewed changes to firms' methodologies, and studied relevant academic research. We have engaged with key stakeholders on their experiences with data and technology and have monitored the activities of other standard setters and regulators. Our work has also been informed by the [PCAOB Data and Technology Task Force](#) (Task Force), whose members provide additional insights into the use of technology by auditors and preparers.

This Spotlight shares certain observations from our research and outreach activities.

PCAOB Staff Activities and Observations

We began by gaining an understanding of how technology-based tools are currently being used by auditors, as well as how their use is evolving and how they might be used in the future. We also engaged with preparers to understand how they are using technology in the financial reporting process. This understanding has informed the staff's assessment of the potential implications for PCAOB standards.

The PCAOB staff has prepared this publication to provide information on PCAOB initiatives. This publication does not establish rules of the Board, nor has it been approved by the Board.

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PCAOB Spotlights

The information in this Spotlight is not staff guidance; rather, it highlights timely and relevant observations for auditors and other key stakeholders.

Recently, the staff conducted a deeper dive into how auditors are using technology-based tools to identify and assess risks of material misstatement. Our work included considering input from Task Force members, reviewing changes in firms' methodologies, holding discussions with auditors, and reviewing information gathered from PCAOB oversight activities. Our work also included analyzing the requirements of relevant PCAOB standards, including AS 2110, *Identifying and Assessing Risks of Material Misstatement*, and AS 1105, *Audit Evidence*, in the context of the use of technology-based tools.

General Observations on PCAOB Standards

To date, the results of our activities indicate that PCAOB auditing standards are not precluding or detracting from firms' ability to use technology-based tools in ways that could enhance audit quality (for example, to perform more thorough and better-informed risk assessments). But we have heard—and we acknowledge—that our current standards do not explicitly encourage the use of such tools, indicate when their use might be appropriate, or highlight related risks or pitfalls associated with their use.

We are aware that the nature and extent of the use of technology-based tools in the audit differ among firms. Some firms have made significant investments in internally-developed tools for use in the audit. We also understand that the increased availability of “off-the-shelf” technologies, such as analytical software packages, has made these tools more readily available for use by firms. While the use of technology-based tools may become increasingly common and more extensive in the future, we consistently hear that PCAOB standards will need to continue to accommodate traditional audit techniques, potentially for some time to come. We generally believe that principles-based auditing standards are more likely to be adaptable to evolving situations, such as the increasing use of technology-based tools.

Observations on Identifying and Assessing Risks of Material Misstatement

We have learned through our outreach activities and feedback from the Task Force that technology-based tools are often used in today's audits to identify and assess risks of material misstatement. Our oversight activities have further indicated that some firms, the larger firms in particular, are also using technology-based tools to perform certain substantive procedures, for example in connection with auditing certain assertions related to revenue.

We took a deeper dive into how technology-based tools are being used by auditors as it relates to the identification and assessment of risks of material misstatement and how compliance with the current requirements of our standards is being accomplished.

Our observations related to the use of these tools in identifying and assessing risks of material misstatement include:

- Technology-based tools can enhance the auditor's ability to efficiently and effectively analyze larger volumes of data, and in more depth, than

Data Analytics

The term “data analytics” is not defined in PCAOB standards. The meaning of the term can vary depending on its context, and this document does not seek to define the term. For purposes of this document, the term “data analytics” encompasses the analysis of information for purposes of identifying trends and relationships in data sets. Such analysis may include, among other things, predictive and regression analysis, visualization of data, full population analysis, or correlation analysis.

when using manual audit techniques alone. This may inform the auditor's risk assessment by providing different perspectives, exposing previously unidentified relationships that may reveal new risks, and providing more information to be used when assessing risks.

- Technology-based tools may assist the auditor in addressing requirements in PCAOB risk assessment standards. For example:
 - o Enabling the consideration of a wider range of characteristics of accounts and disclosures in financial statements.
 - o For certain automated processes, assisting the auditor in determining whether relevant controls have been effectively implemented.
- The use of technology-based tools when performing certain risk assessment procedures does not, however, diminish the importance of addressing other requirements related to risk assessment that do not necessarily lend themselves to the use of tools (for example, discussion among engagement team members regarding risks of material misstatement due to error or fraud). Nevertheless, the use of such tools may provide better information to enable compliance with such requirements in a more meaningful and productive manner (for example, by enabling a more-informed identification and assessment of risks).
- The auditor's training, experience, and understanding of the capabilities and limitations of technology-based tools are important factors to their effective use in the audit. The auditor's ability to select the appropriate technology-based tool, determine the appropriate parameters or filters to be applied, and appropriately interpret the results, in light of the facts and circumstances of the engagement, all contribute to whether or not the use of the tool enhances the identification and assessment of risks of material misstatement.

Observations on Audit Evidence

We also conducted research related to the application of the audit evidence standard. Observations related to this standard include:

- The definition of audit evidence along with the objective of the auditor (i.e., to plan and perform the audit to obtain appropriate audit evidence that is sufficient to support the opinion expressed in the auditor's report) remain appropriate irrespective of whether technology-based tools are used and whether evidence is in paper or digital form. In particular, the concepts of sufficiency (i.e., quantity) and appropriateness (i.e., quality or relevance and reliability) of audit evidence can be applied regardless of the nature or form of information being considered or evaluated as audit evidence.
- The audit evidence standard does not preclude the auditor from using technology-based tools to perform audit procedures more efficiently to obtain audit evidence, or using tools to perform audit procedures that are specifically described in the standard (for example, inspection, recalculation, reperformance).

- The audit evidence standard does not preclude the auditor from designing audit procedures, including those performed using technology-based tools, to accomplish more than one purpose. The standard indicates that audit procedures for obtaining audit evidence can be classified as risk assessment procedures and further audit procedures, which consist of tests of controls and substantive procedures. The standard, however, does not include an explicit requirement to classify an audit procedure as one of these types. The purpose of an audit procedure determines whether it is a risk assessment procedure, test of controls, or substantive procedure.
- When using information produced by the company as audit evidence, including when the information is to be used in a technology-based tool, the requirements to test the accuracy and completeness of information (either directly or by testing relevant controls) and evaluate whether the information is sufficiently precise and detailed for purposes of the audit apply. The procedures performed to address these requirements might vary in nature and extent, depending on whether the information is being used to support the auditor's risk assessment procedures or the conclusions being reached through the performance of substantive procedures or tests of relevant controls.

Observations on Firm Policies and Procedures

We observed that firms using technology-based tools have established various policies and procedures regarding the use of such tools. Generally, those firms have established expectations or requirements for determining the appropriate use of tools by engagement teams. Examples of policies and procedures include:

- Establishing and maintaining criteria (for example, specifications, guidelines, goals, or limits) for acquiring or developing new technology-based tools or making changes to existing tools;
- Maintaining an inventory of approved tools and policies and procedures regarding the use of such tools at the engagement team level;
- Establishing requirements for training necessary for engagement team members to use such tools;
- Establishing engagement team responsibilities regarding the use of such tools (for example, for entering engagement-specific parameters or filters); and
- Requiring engagement teams to involve firm personnel that have experience in the use of more complex technology-based tools.

Policies and procedures vary depending on the complexity of the technology-based tools, the engagement team's ability to change or modify such tools, and the extent to which the tools are used. Policies and procedures sometimes also address whether certain tools are available for use or are required to be used in every engagement.

We have also observed that, in addition to the development of technology-based tools to assist auditors in performing audit procedures, some firms

have applied technology to other aspects of the audit, including supervision and communication. Some firms have developed tools intended to, among other things, improve communications between the auditor and the company or among members of the engagement team (including other auditors), track information received during the audit, automate the documentation of procedures performed, and facilitate the efficiency of supervisory review.

What's Next?

To date, the results of our activities indicate that PCAOB auditing standards are not precluding or detracting from firms' ability to use technology-based tools in ways that could enhance audit quality. PCAOB staff will continue to conduct research and engage in outreach activities, focusing on:

- Assessing changes in the use of technology in auditing and financial reporting;
- Obtaining a more in-depth understanding of how auditors are using technology-based tools in responding to identified risks of material misstatement;
- Continuing to analyze how requirements in PCAOB standards apply; and
- Collaborating with other regulators and standard setters, as appropriate.

We are also considering the evolving and greater use of technology by firms in performing engagements as part of the project on potential revisions to PCAOB quality control standards.

We Want to Hear from You

These observations have been informed by our outreach efforts and input from the Task Force. However, we acknowledge that others may have different experiences with technology-based tools. We welcome the opportunity to hear from auditors and preparers about how they are using technology in the audit, in internal control over financial reporting, and in the preparation of the financial statements, as well as how the use of the tools is affected by the requirements in the PCAOB's standards. We are also interested in hearing about how technology is being used in new or different ways in light of the challenges of the current environment in relation to COVID-19. If you are interested in sharing your experiences, please contact us at TechnologyOutreach@pcaobus.org.

You can learn more about this project on the [PCAOB's data and technology research project page](#). You can also visit the [PCAOB's Research and Standard-Setting Projects Page](#) to learn about other research and standard-setting projects. We encourage you to also [sign up for project updates](#).

In an effort to continue to improve external communications and provide information that is timely, relevant, and accessible, we want to hear your views regarding this document. **Please take 2 minutes to fill out our [short survey](#).**

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