PCAOB
PUBLIC COMPANY ACCOUNTING OVERSIGHT BOARD

SPOTLIGHT

Data and Technology Research Project Update, May 2021

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OVERVIEW

Advancements in technology continue to affect the nature, timing, and preparation of financial information, including preparers' controls around financial information, and the planning and performance of audits. The Board's strategic plan highlights the need to anticipate and respond to these advancements 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.

We are issuing this Spotlight to provide transparency into our research project and share insights from our research and outreach activities during 2020. The observations highlighted in this document build upon those previously shared in our May 2020 *Spotlight for PCAOB Stakeholders – Data and Technology Research Project Update* ("May 2020 Spotlight").

PCAOB STAFF ACTIVITIES AND OBSERVATIONS

Throughout last year, PCAOB staff continued to conduct research and outreach activities as part of assessing whether regulatory action is necessary in response to the increasing use of technology by auditors and preparers. Our research focused on furthering our understanding about how auditors are using technology-based tools to respond to the identified risks of material misstatement. Our work included analyzing the requirements of certain PCAOB standards – including *AS 2301, The Auditor's Responses to the Risks of Material Misstatement; AS 2310 The Confirmation Process;* and *AS 2510, Auditing Inventories* – in the context of the evolving use of technology-based tools.

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

The nature, timing, and extent of the use of technology-based tools in an audit is dependent on the particular facts and circumstances of each engagement and may be governed by policies and procedures established by the audit firm. Accordingly, the PCAOB staff observations below should not be viewed as an endorsement of or recommendation for the use of any specific technology-based tool in any particular audit.

As highlighted in our May 2020 Spotlight, we assessed whether there is a need for guidance on, or changes to, *AS 1105, Audit Evidence*. This assessment, in conjunction with our outreach and research, suggested that guidance or changes to the standard may be needed, given the increasing prevalence of technology-based tools and the increasing availability and use of information from sources external to the company, both in financial reporting and as audit evidence. We therefore added a project related to audit evidence to our research agenda in September 2020.

As part of our ongoing research activities, we continued to gather information from PCAOB oversight activities, review changes to audit firms' policies and methodologies related to the use of technology-based tools, and consider relevant academic research. We continued to engage with preparers and

key stakeholders on their experiences with data and technology, and we 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 valuable perspectives on the use of technology by auditors and preparers, as well as the application of PCAOB standards in relation to its use.

In connection with our 2020 outreach, we inquired about the effect of the COVID-19 crisis on the use of technology by auditors and preparers. Overall, our observations suggest that the pandemic has not significantly altered the nature, timing, and extent of risk assessment procedures or the auditor's response to risks performed using technology-based tools. In some cases, auditors expanded the use of technology in areas such as facilitating supervision and review. Certain additional observations related to the effect of COVID-19 were highlighted in *Spotlight: Staff Observations and Reminders during the COVID-19 Pandemic*.

General Observations on Technology-Based Tools and PCAOB Standards

To date, the results of our activities continue to indicate that PCAOB auditing standards do not preclude audit firms' use of technology-based tools during an audit. We have heard, however, and we continue to acknowledge, that our current standards do not explicitly encourage the use of such tools, indicate when their use may or may not be appropriate, or highlight related risks or possible pitfalls associated with their use. PCAOB staff will continue to gather input on advancements in technology and changes in how auditors use technology. We will consider the effects of those changes on audit quality and determine any implications for our standards.

The nature, timing, and extent of the use of technology-based tools continue to differ among audit firms. Investment in and use of these tools are not, however, limited to only the larger audit firms. Some smaller audit firms are also making investments by developing tools internally, partnering with software companies to design and develop customized tools, or directly purchasing "off-the-shelf" tools. In addition, the auditor's use of technology-based tools is influenced by preparers' use of technology.

Audit firms continue to make progress in developing their own technology-based tools by designing tools for use in multiple audits and across multiple industries, as well as tools that are tailored for specific circumstances. For example, some tools are designed to be used in the audits of companies in specific industries (e.g., healthcare), for a particular engagement, or to assist with the auditing of specific transactions (e.g., analysis of insurance company premiums and claims). Further, we have observed that some audit firms are customizing tools for specific accounting or finance systems or for auditing certain components of a system (e.g., general ledger, inventory management, investment recordkeeping, or payroll).

Some audit firms believe that the use of technology-based tools, in certain instances, provides more persuasive evidence than traditional audit techniques. For example, as part of performing audit procedures to test the occurrence of revenue, some auditors use a technology-based tool that matches revenue transactions with subsequent cash receipts for an entire population in lieu of traditional audit techniques (e.g., manual tests of details of a sample of transactions).

Our outreach continues to reinforce our view that even as the use of technology-based tools becomes increasingly common, PCAOB standards will need to continue to address traditional audit techniques (e.g., the use of paper confirmations). This would, among other things, facilitate audits where technology-based tools are not used to perform audit procedures or the use of such tools faces challenges (e.g., data extraction or system limitations, legal restrictions, or data privacy concerns).

Service Centers

Some audit firms have established shared service centers or other specialist groups (collectively "centralized resources") that are involved in the use of technology-based tools on individual audits. Such centralized resources may, for example, extract, aggregate, analyze, format, and disseminate information to engagement teams in support of their audit procedures. While the approach to involving centralized resources in the use of technology-based tools varies among audit firms (e.g., depending on the type of tools used or availability of data), in most instances members of the engagement team test the completeness and accuracy of company data used in the tools.

Automation

Some audit firms are using technology-based tools (e.g., robotic process automation) to automate certain aspects of repetitive or less complex audit procedures (e.g., reconciling account balances to the general ledger, vouching sales transactions to subsequent cash receipts, or preparing confirmations to be sent to third parties). Certain audit firms are also using optical character recognition software to review certain company documents for specific terms selected by the auditor (e.g., reviewing lease agreements for payment terms, contracts for unusual terms and conditions, and notes to the financial statements for changes from prior periods).

Auditor's Responses to the Risks of Material Misstatement

In 2020, we took a deeper dive into how auditors are using technology-based tools in responding to the risks of material misstatement under AS 2301. That standard describes two types of audit responses: (i) overall audit responses (i.e., those that have an overall effect on how the audit is conducted such as incorporating unpredictability in the selection of audit procedures to be performed) and (ii) responses involving the nature, timing, and extent of audit procedures that address risks of material misstatement for each relevant assertion of each significant account and disclosure.

Our observations related to the use of technology-based tools in the auditor's overall audit responses include the following:

- ***Unpredictability.*** Technology-based tools can aid auditors in incorporating unpredictability in the nature and extent of audit procedures (e.g., aiding the auditor in identifying transactions outside of the traditional selection criteria). The nature and volume of information available to auditors when using technology-based tools, including company data and data from third-party sources, may allow auditors to increase the level of unpredictability in their work. For example, tools may give an auditor the increased ability to analyze, on a disaggregated basis, complete populations of transactions in new or unexpected ways, thus thwarting attempts by management to anticipate the auditor's procedures.

- ***Management Bias.*** In certain instances, technology-based tools can aid auditors in analyzing data for indicators of management bias. For example, such tools may be used to identify instances in which management consistently selects prices from the upper end of a range when valuing securities.
- ***Revisions to Planned Audit Response.*** Technology-based tools may provide auditors with new information that may suggest a need for revisions to their planned audit response. For example, through the use of a tool, an auditor may identify new or different risks of material misstatement for a certain population of transactions, which in turn may require the auditor to revise their planned audit response.

Our observations related to how technology-based tools affect the nature, timing, and extent of audit procedures performed to address risks of material misstatement include the following:

- ***Refinement of Selection Criteria within an Audit Procedure.*** Some technology-based tools enable auditors to perform multiple iterations of a test. For example, in some instances, auditors ran several iterations of an audit procedure within a tool in order to detect items (e.g., specific transactions or journal entries) that may be affected by the identified risks of material misstatement. With each iteration, the auditor would refine the selection criteria based on the information learned from previous tests.
- ***Disaggregation of Data.*** In some instances, the use of technology-based tools may enable auditors to disaggregate data to a level where the most plausible and predictable relationships are more readily identified, which in turn can improve the precision of an audit procedure (e.g., improving the precision of an expectation developed as part of a substantive analytical procedure or the precision of an independent estimate developed to test an accounting estimate).
- ***Testing Data.*** Technology-based tools have enabled some auditors to compare current period and prior period data to identify changes in specific attributes in a data population that are not expected to change (e.g., date of birth included in pension demographic data). Some auditors have used this approach to identify changes in a population compared to prior periods and focus their testing on the items that are potentially more affected by the identified risks of material misstatement in lieu of traditional audit techniques (e.g., selecting a random sample).
- ***Testing Controls.*** While technology-based tools, in their current form, are not widely used to test all attributes of a control, tools can provide evidence about certain attributes of a control's design (e.g., analyzing system configurations, such as user access rights, access restrictions, and segregation of duties), and operating effectiveness (e.g., the occurrence of an electronic signoff or the completeness and accuracy of a system-generated report), particularly if a control attribute is automated.
- ***Substantive Procedures for Significant Accounts.*** Some auditors are using technology-based tools to perform substantive audit procedures to audit certain assertions for significant accounts such as revenue, cash, trade accounts receivable, investments, and inventory. For example, some auditors are using tools as part of testing the occurrence of revenue by comparing the quantity of items ordered to

the quantity of items shipped and invoiced for an entire population.

- ***Accounting Principles and Policies.*** Some audit firms have developed technology-based tools to assist in evaluating whether accounting principles and policies have been consistently applied to the relevant populations of transactions (e.g., utilizing tools to ensure consistent application of revenue recognition across transactions).
- ***Evaluating Disclosures.*** Some audit firms have developed technology-based tools that assist in evaluating the notes to the financial statements to identify incomplete or inaccurate disclosures (e.g., the use of tools to compare the company's disclosures to those in prior periods or to industry peers).

Effect of Technology on Auditing Inventory

Our outreach has shown that some preparers have implemented or plan to implement advanced inventory management systems to monitor and facilitate the movement, counting, and recording of inventory. This increase in the use of technology in the inventory process is not limited to preparers, as auditors are increasingly using technology-based tools to assist in auditing inventory and in complying with the requirements of AS 2510. While the standards do not explicitly describe how the auditor may use technology when auditing inventory, the existing requirements remain relevant when technology is used. Our observations related to the effect of technology on auditing inventory include the following:

- ***New Controls (Including Policies and Procedures).*** At some companies, the increased use of technology in their inventory process has required the companies to develop – and the auditor to understand and evaluate – new policies and procedures and to implement new controls (e.g., new information system access controls to ensure that only appropriate personnel have the ability to manipulate electronic data, new automated controls to interface the inventory management system with the general ledger).
- ***Design and Frequency of Inventory Counts.*** Automation and advanced inventory management systems have resulted in some management and internal audit groups reassessing the design and frequency of their inventory counts based upon the enhanced accuracy of perpetual inventory systems, which may affect frequency and timing of the auditor's inventory observations.
- ***Performance and Documentation of Observations.*** Some audit firms have developed technology-based tools to assist with performing and documenting inventory observations. For example, technology-based tools can enable the auditor to make test count selections, document the test counts within the tool, and generate the resulting audit documentation.
- ***Remote Observations.*** We understand that some companies are using technology-based tools, such as location cameras and drones, to conduct inventory counts remotely. Some auditors are using similar technology-based tools to facilitate the remote performance of their inventory observation. In particular, we observed these tools being used during the COVID-19 pandemic to virtually observe inventory or physical assets. Where the tools are operated by management, internal audit, or a vendor, the auditor performs certain procedures to determine that the tools produce reliable audit evidence. This may include assessing vendor qualifications (e.g., licensing and experience).

- ***Analytical Procedures.*** Some auditors are using technology-based tools to perform analytical procedures in connection with auditing certain assertions related to inventory (e.g., to analyze how inventory composition has changed over time when testing the valuation of inventory or to select items for inventory observation when testing for existence based upon certain risk characteristics, such as new or higher value inventory).

Use of Technology in the Confirmation Process

Our outreach has shown that auditors are increasingly using technology-based tools in the confirmation process. In some instances, the tools used by auditors have been developed by their firm for their exclusive use. In other instances, the auditors use tools and services provided by external parties. Our observations related to the use of technology by auditors in the performance of confirmation procedures include the following:

- ***The Confirmation Process.*** Technology is generally used to help the auditor maintain control over the confirmation process and improve process efficiency, by facilitating certain administrative aspects of the confirmation process, such as preparing, distributing, receiving, and tracking confirmations. The use of technology may assist the auditor in communicating with management about the status of outstanding positive confirmation requests, as well as in the identification of accounts or transactions that may require additional investigation or alternative procedures.
- ***Design of the Confirmation Request.*** Our outreach has shown that the use of technology generally does not affect the design of the auditor's confirmation request (i.e., positive or negative confirmations). Many of the factors that may affect the reliability of paper confirmations – such as the form of the confirmation request, prior experience on the audit or similar engagements, the nature of the information being confirmed, and the intended respondent – are also relevant to electronic confirmations.
- ***Considerations Related to the Use of Confirmations.*** While we have observed that in certain instances the use of electronic confirmations can make it easier for the recipient to respond efficiently, new considerations have emerged related to their use (e.g., confirmation email captured by spam filter, respondent deletes or ignores the notification out of concern it is a phishing scam), which may affect the confirmation response rate.
- ***Risks Related to the Confirmation Process.*** Many of the risks that exist with the use of paper confirmations (e.g., false mailing address for the intended recipient, paper response received from someone other than the intended recipient) also exist with the use of electronic confirmations, although in a slightly different form (e.g., false e-mail address for the intended recipient, response received from false e-mail account). Regardless of the form of the confirmation, auditors perform procedures to assess the reliability of the response (e.g., telephone call to the purported sender when received electronically, internet search to verify the validity of a business or other recipient).

WHAT'S NEXT?

In 2021, PCAOB staff will continue to conduct research and engage in outreach activities, including with our Task Force, focusing on:

- Updating our understanding of changes in the use of technology in auditing and financial reporting, including how requirements in PCAOB standards affect the use of technology by auditors;
- Obtaining a more in-depth understanding of how auditors are using technology-based tools in responding to identified risks of material misstatement, focusing on, for example, substantive analytical procedures and audit sampling;
- Understanding how auditors are using technology-based tools to identify, assess, and respond to fraud risks (e.g., risk of management override of controls); and
- Collaborating with other regulators and standard setters, as appropriate.

We are also continuing to consider how PCAOB quality control standards should address the evolving and greater use of technology by audit firms.

We Want to Hear from You

These observations have been informed by our outreach efforts and input from our Task Force. We acknowledge, however, that others may have different experiences with, and perspectives on, the use of technology-based tools, particularly in light of the challenges of the current COVID-19 environment.

We welcome the opportunity to hear from auditors about how they are using technology in the audit and how the use of the tools is affected by the requirements in the PCAOB's standards. We also welcome hearing from preparers about how technology is used in internal control over financial reporting and in the preparation of the financial statements, and from other stakeholders – including audit committee members, investors, and academics – about how technology may be used in auditing and financial reporting.

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**.

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