AN OVERSIGHT TOOL FOR AUDIT COMMITTEES

EMERGING TECHNOLOGIES

CENTER FOR AUDIT QUALITY

DECEMBER 2018

Introduction

Emerging technologies, such as artificial intelligence (AI), robotic process automation (RPA), drones, and blockchain, are changing how business gets done. One study estimates that almost half of all finance tasks in corporate finance departments will be automated by 2021, up from 34 percent today.[1]

Although emerging technologies present opportunities to increase efficiency and the quality of financial reporting, these opportunities are not risk-free. To the extent these technologies impact financial reporting, audit committees play an important oversight role in how companies manage the related financial reporting risk. Audit committees should engage with management to determine whether endeavors in emerging technologies are aligned with the company's emerging technology strategy regarding financial reporting.

The Center for Audit Quality (CAQ) has developed this tool to help audit committees execute their oversight responsibilities for financial reporting impacted by emerging technologies. Leveraging the work of the Committee of Sponsoring Organizations of the Treadway Commission (COSO), this tool provides a framework for conducting effective oversight of a company's use of emerging technologies in the financial reporting process.[2] As explored in greater detail below, this framework has five key components:

I. Control Environment
II. Risk Assessment
III. Control Activities
IV. Information and Communication
V. Monitoring

"Chief financial officers are advancing the enterprise-wide digital agenda, with 77 percent heading up efforts to improve efficiency through adoption of digital technology, and 77 percent also exploring how disruptive new technologies could benefit organizations and the business ecosystem."

Accenture, "The CFO Reimagined: From Driving Value to Building the Digital Enterprise"

In addition to this five-part framework, the tool highlights two technologies—artificial intelligence and robotic process automation—which, unlike the current state of blockchain technology, are more widely used in the marketplace. Finally, the tool includes questions within each of the five components that audit committees may ask management and auditors to help inform their oversight of financial reporting.

1. See Accenture, "The CFO Reimagined: From Driving Value to Building the Digital Enterprise" (September 2018).
2. See Committee of Sponsoring Organizations of the Treadway Commission, "*Internal Control—Integrated Framework*" (May 2013).

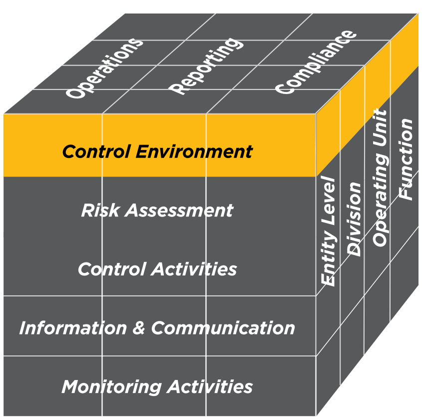
Oversight Framework for Audit Committees

Audit committees, working collaboratively with the entire board and management, play a key role in monitoring the system of internal control, taking into account emerging technologies. That is true whether the emerging technology project results in

- a change in the company's products and services,
- a change in internal enterprise resource planning (ERP) systems, or
- the use of outside providers of technology and technology services.

Audit committees of the board of directors have an oversight responsibility related to the company's financial reporting process. As a result, management and directors have a vital interest in whether the quality of the company's books and records and related internal accounting controls enable them to address their responsibilities adequately. This would include having an interest in understanding the potential risks to financial reporting objectives that may be associated with emerging technologies.

The following five-part framework, which leverages COSO's *Internal Control – Integrated Framework*, may help audit committees advance their oversight of and involvement with emerging technologies used in financial reporting. Under each component of the framework are questions audit committees can ask management to fulfill their oversight responsibilities. The questions are not intended to be exhaustive.



UNDERSTAND THE COMPANY'S EMERGING TECHNOLOGY STRATEGY AND ANY SPECIFIC TECHNOLOGIES CONTEMPLATED

The control environment is the set of standards, structures, and processes that provide the foundation for carrying out internal control across the organization. Emerging technologies not only present opportunities to increase efficiency but also the quality of financial reporting. Audit committees play a vital oversight role in helping to establish the right control environment for the adoption of risk management practices by management related to emerging technologies that impact financial reporting. In carrying out their responsibility, audit committees should be aware of the company's emerging technology strategy regarding financial reporting. It also is important that the audit committee be knowledgeable about the specific technology being contemplated, so that it can oversee its alignment with the company's strategy as well as its impact on the business and financial reporting.

In overseeing the strategy, audit committees can help monitor

- whether internal and external resources with the right expertise have been devoted to such projects;
- that technological performance and accurate reporting is evaluated in a systematic way; and
- that a commitment to integrity, ethical values,

IMPACT ON FINANCIAL REPORTING: ARTIFICIAL INTELLIGENCE

The terms *AI*, *machine learning*, and *deep learning* are often used interchangeably, although there are distinctions among them.

AI is the ability of a machine to perform cognitive tasks that are typically associated with human minds (e.g., problem solving, learning, perceiving, reasoning).

Machine learning is one approach to achieve AI. As humans gain more life experiences, they typically learn more and develop greater insights. Machine learning technology enables a computer to learn from experiences in a similar manner. This means that computers do not have to be continually programmed with fixed rules. As trends change, computers can automatically learn the changing landscape and adjust their decision making.

All AI and machine learning are captured in a *model*. **Deep learning** uses more complex models that can further capture detailed nuances from the learning experience.

While individual building blocks for AI (e.g., data, algorithms, computing storage, processing power) have been present for a long time, recent advances and convergence of these building blocks have propelled AI to reality. Typical use cases for implementing AI involve business problems that can be solved by the following processes:

1. **Classification** involves training a machine to recognize patterns in data and then categorize new data as belonging to a set of categories. Take the following example:
   - *Reconciliations* — Organizations have reconciliations between internal systems as well as with external systems. Once reconciling items are resolved, a history of actions taken also is recorded. AI systems can learn patterns based on historical actions and recommend actions to be taken for an unreconciled item.
2. **Clustering** involves training a machine to create a set of categories for which individual data instances have a set of common or similar characteristics. Take the following example:
   - *Fraud detection* — The insurance industry uses machine learning to identify clusters of fraud in historical claims and compare to new claims to determine if they may be fraudulent.
3. **Regression** involves training a machine to estimate the next numeric value in a sequence. This type of problem solving is sometimes called *prediction*, particularly when it is applied to time series data. Take the following example:
   - *Forecasting* — Companies forecast revenues and expenses based on historical indicators that may be indicative of future patterns. The forecasts can be used for budgeting or to develop forward-looking statements.

and compliance is reinforced at all levels of the company, including within components of the organization dedicated to emerging technologies.

OVERSIGHT IN ACTION: QUESTIONS FOR THE AUDIT COMMITTEE TO CONSIDER ASKING MANAGEMENT

1. What are the objectives associated with the use of the emerging technology?
   - Will the technology contribute to a business growth target, provide a competitive benefit, address an existing process risk, or reduce costs?
   - Does the use of the emerging technology indicate a change in the company's business model or strategic outlook in ways that create new financial reporting risks?
2. How does the emerging technology project integrate with management's existing digital and analytics plans?

- As one example, for an AI project, is the solution intended to work as an assisted AI (i.e., AI that improves what the business is already doing), augmented AI (i.e., AI that enables the business to do things it cannot), or autonomous AI (i.e., AI that acts on its own)?

3. Does use of the emerging technology raise tax, legal, regulatory, or financial reporting questions that require external advice?

4. What has the company done to train and maintain its internal resources and technological competencies related to emerging technologies?

IMPACT ON FINANCIAL REPORTING: ROBOTIC PROCESS AUTOMATION

RPA is driven by computer-coded, rules-based software robots (bots) that model and automate business processes. RPA follows predetermined protocols with precision, allowing for increased accuracy and cost efficiencies. Unlike AI, RPA does not learn or make judgments.

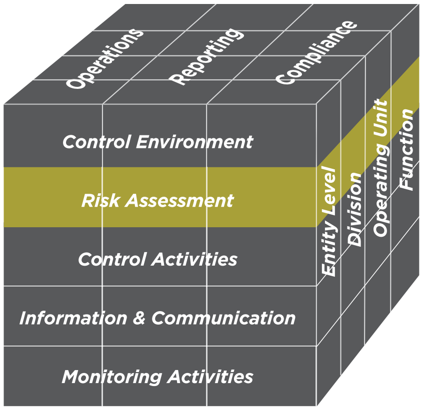
RPA operates in the user interface layer where it automates processes without being embedded in the ERP software. This makes RPAs easier and less expensive to implement compared with other automation technologies.

Based on these characteristics, bots are well-suited to provide ongoing cost savings and consistency. Another valuable benefit of RPA is the ability to migrate information across systems. For example, a bot might take information from an email, move it to a business production system, and then move it into an ERP or even a consolidation system. These “swivel chair” tasks historically required shared service resources or other personnel to move information manually across systems.

Other RPA examples include automating a workflow (e.g., open, read, and create emails), automating rule-based calculations (e.g., calculation of the depreciation charge on property, plant, and equipment), and recording the journal entry to the general ledger each month.

Certain business functions may be better suited for automation than others. An RPA strategy could be applied to business functions with the following characteristics:

- A need for a high degree of precision, accuracy, and consistency
- Repetitive, manual transaction processing
- Information being housed in multiple systems
- Dependency on manually intensive yet simple tasks such as data entry, data manipulation, and report generation



UNDERSTAND MANAGEMENT'S RISK IDENTIFICATION AND ASSESSMENT PROCESS

Risk assessment involves a dynamic and ongoing process for identifying and assessing risks in order to achieve financial reporting objectives. Audit committees might consider whether management has assessed the risks associated with changes to company processes as a result of emerging technology projects and whether controls are in place to identify new risks as they arise. Audit committees may think about whether they have adequate access to technology expertise (which could be external).

Audit committees also may consider what procedures are in place to help ensure that risk assessment of how technology impacts financial reporting is an ongoing exercise and does not become stale as technology evolves.

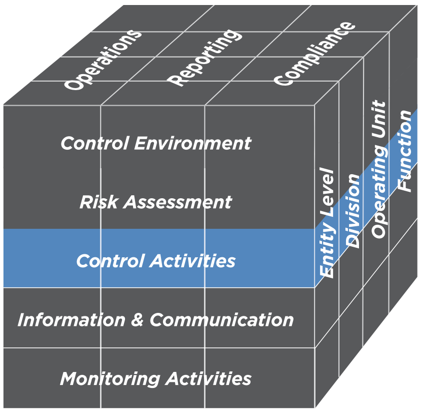
In *Director FAQ: Board Oversight of Emerging Technologies*, the National Association of Corporate Directors (NACD) recommends the following practices to support board oversight of emerging technologies:

- Consider recruiting technology experts to fill open board seats.
- Invest in technology-focused director education.
- Consider establishing a board-level technology committee or setting up a technology advisory board.
- Integrate the topic of technology disruption into discussions about strategy and risk.[3]

OVERSIGHT IN ACTION: QUESTIONS FOR THE AUDIT COMMITTEE TO CONSIDER ASKING MANAGEMENT

1. What risks associated with the use of the emerging technology have management considered?
   - How has management identified and addressed fraud risks associated with emerging technology environments?
   - Has management considered additional transparency-related risks (e.g., risks related to the identification of related parties and illegal acts). If so, what are the plans to address these risks?
   - Were any new compliance or regulatory risks introduced by using the emerging technology?
2. Has management considered the adequacy of the current risk assessment process relative to the risks introduced by the emerging technology?
3. How has management evaluated the sufficiency of existing policies and procedures related to the safeguarding of assets when implementing the emerging technology?
4. Has management identified intermediaries or third parties integral to the emerging technology functionality? If so, are current third-party risk management practices sufficient to adequately address the emerging technology?

3 See NACD, *Director FAQ on Board Oversight of Emerging Technologies* (NACD, August 2018). Used with permission from NACD.



UNDERSTAND THE CONTROL ACTIVITIES IN PLACE THAT RESPOND TO THE IDENTIFIED RISKS

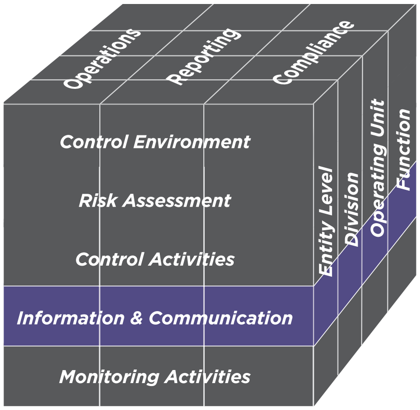
Control activities are the specific actions established to ensure that the risk of failing to meet an objective is mitigated to an appropriate level. Audit committees may seek to understand from management that control activities address

- how systems that rely on emerging technologies are ready to respond to financial reporting needs prior to deployment;
- if the technology is functioning as intended and the output is reliable;
- how emerging technologies will be tested and integrated with other systems;
- how information technology (IT) considerations regarding unauthorized access, user provisioning, and segregation of duties are controlled; and
- how important assets (including customer data and intellectual property assets) are safeguarded.

If the emerging technology involves intermediaries or third parties, audit committees may want to understand how management has satisfied themselves that such organizations also operate in a well-controlled manner and do not pose a threat to timely and accurate financial reporting.

OVERSIGHT IN ACTION: QUESTIONS FOR THE AUDIT COMMITTEE TO CONSIDER ASKING MANAGEMENT

1. How has management assessed the current control environment to determine whether new controls are needed in response to the additional risks introduced by the emerging technology?
2. Are controls in place to address the risk that the technology is not operating as intended (i.e., to assess the reliability of the outputs from the technology)?
   - For an AI project, how is the introduction of bias in the data and algorithm used by the model prevented?
3. What controls are in place to help ensure that those charged with oversight would be informed if a cybersecurity breach occurred?
4. How have contingency plans been assessed or updated to help ensure continuity of business and management of risks?



ESTABLISH INFORMATION AND COMMUNICATION PROTOCOLS

Information and communication are crucial to the dynamic process of managing risks and achieving financial reporting objectives. Managers need current, complete, and accurate information to conduct their activities. Audit committees must have confidence that controls are in place to make sure that all information needed for financial reporting purposes is captured, used, and retained in a timely and accurate manner. When new systems or processes are being developed by using a form of emerging technology, the impact on existing processes and systems, including integration risks, also should be considered.

Audit committees should have communication protocols for obtaining the information they need to effectively carry out their responsibilities, which may require the managers of large technology projects to present their progress on a periodic basis.

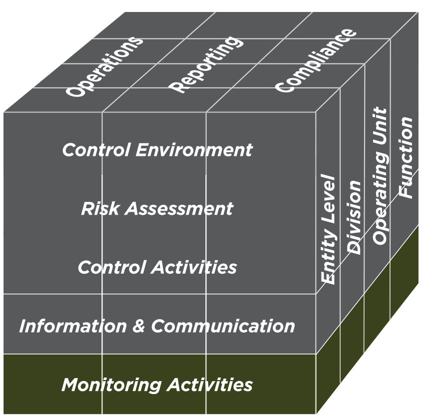
OVERSIGHT IN ACTION: QUESTIONS FOR THE AUDIT COMMITTEE TO CONSIDER ASKING MANAGEMENT

1. How will key financial reporting needs be considered to minimize potential disruptions when implementing the emerging technology?

2. How will the technology integrate with the current IT systems? Are there any integration risks that need to be addressed?

3. How has management evaluated existing IT practices to help ensure they address data management and governance for the emerging technology?

4. Do existing communication lines (internal and external) need to be evaluated to help ensure continued compliance with financial statement disclosure requirements?



MONITOR EMERGING TECHNOLOGY ACTIVITIES

Monitoring represents an ongoing process to ensure that policies, procedures, and controls are present and functioning effectively. Both management and the board will have ways to assess whether controls are operating effectively, and technology considerations should be part of those monitoring efforts. Audit committees may consider leveraging the internal audit function to probe whether emerging technology programs are operating with an appropriate level of rigor and control so that financial reporting objectives are met. If deficiencies are identified, the audit committee plays an important role in making sure appropriate corrective action is taken in a timely manner. Finally, understanding the external auditors' perspective and how they approach financial reporting risks associated with emerging technologies likely would be a part of the audit committee agenda.

OVERSIGHT IN ACTION: QUESTIONS FOR THE AUDIT COMMITTEE TO CONSIDER ASKING MANAGEMENT

1. What monitoring activities have management put in place to validate the operational consistency of the emerging technology?
2. Is the frequency of existing monitoring and reporting to the audit committee sufficient in light of the pervasiveness of the emerging technology and its impact on financial reporting?
3. What monitoring has been established by management to consider the emerging technology risks related to recording, processing, summarizing, and reporting on financial information—including management's discussion and analysis—and financial statement disclosures?
4. In the event of a failure or deficiency related to management's obligations, what processes and controls are in place to help ensure that appropriate levels of management and the audit committee are involved in the review of the related disclosures, if applicable?

Impact to the Audit: Questions for Auditors

To inform their oversight activities related to management, audit committees should have discussions with their auditors about emerging technologies used in financial reporting. The following questions may help audit committees engage with auditors on this topic:

1. Does the audit engagement team include individuals with the right expertise to assess and address risks related to the emerging technology? Is there a need to involve additional specialists? If so, will they be from within the audit firm or external resources?
2. What is the audit firm's experience with the emerging technology?
3. How has the impact of the emerging technology been considered during the auditor's risk assessment process?
4. Does the emerging technology have a significant impact on the planned audit scope?
5. Has the audit team identified any additional risks that management has not sufficiently explored?

"With all these exciting innovations, it is important to remind ourselves that the advent of emerging technologies does not change the fundamental financial reporting framework. If an emerging technology is being used to meet financial reporting or internal control requirements established by the federal securities laws, then auditors need to understand the design and implementation of that technology."

PCAOB Board Member Kathleen Hamm, remarks before the 43rd World Continuous Auditing & Reporting Symposium, November 2018

Conclusion

While emerging technologies often may be considered the domain of engineers and entrepreneurs, audit committees need to be engaged in their company's discussion related to these technologies when they could have a potential impact on financial reporting. An understanding of these emerging technologies and awareness of the opportunities and risks they present is essential for audit committees to discharge their oversight responsibilities.

WE WANT TO HEAR FROM YOU

So that we can provide resources that are informative and best address the needs of our stakeholders, we would appreciate your response to three, short questions.

SHARE FEEDBACK

Survey URL: http://thecaq.qualtrics.com/jfe/form/SV_d44SPcpTIEUs0aV

About the Center for Audit Quality

The CAQ is an autonomous public policy organization dedicated to enhancing investor confidence and public trust in the global capital markets. The CAQ fosters high-quality performance by public company auditors; convenes and collaborates with other stakeholders to advance the discussion of critical issues that require action and intervention; and advocates policies and standards that promote public company auditors' objectivity, effectiveness, and responsiveness to dynamic market conditions. Based in Washington, DC, the CAQ is affiliated with the American Institute of CPAs.

Additional Resources

- BDO: *Technologies Set to Disrupt*
- Crowe: *Four Strategies for Enabling Innovation in the Face of Risk and Compliance*
- Deloitte: *Internal Controls Over Financial Reporting Considerations for Developing and Implementing Bots*
- Deloitte: *Tech Trends 2018*
- EY: *When Boards Look to AI, What Should They See?*
- KPMG: *Are You Ready for the Next Big Wave?*
- KPMG: *Blockchain and Digital Currencies Challenge Traditional Accounting and Reporting Models*
- KPMG: *Board's-Eye View of Data and Analytics*
- NACD: *Board Oversight of Emerging Technologies*
- PwC: *Confidence in the Future*
- PwC: *What Should Corporate Boards Know about Emerging Technologies?*
- RSM: *Disruptive Technology and the Future of Business | Middle Market Businesses Must Keep Pace with Technological Changes*
- RSM: *RSM Survey Details Middle Market Digital Transformation Strategies | How CFOs Are Embracing Innovation to Stay Competitive*

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