Analytics in Auditing Is a Game Changer

With digitalization, robotics and business transformation gaining more momentum in organizations every day, internal audit needs to embrace analytics — and fast.

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Executive Summary

Data analytics will be a game changer for the internal audit profession. Organizations worldwide are undertaking business and digital transformation initiatives, enabling changes that will have far-reaching effects on every enterprise function. Not surprisingly, the ability to utilize data analytics and "big data" to achieve competitive advantage and manage operations and strategic plans ranks among the top risk issues for board members and C-suite executives worldwide.[1] Machine learning and robotic process automation are among the many emerging technologies and innovations with which internal audit functions need to keep pace or else risk being left behind.

Coupled with growing demands from boards and executive management for deeper insights into strategic risks the organization faces, leveraging analytics and robotics are front-burner priorities for chief audit executives and their teams. They are increasingly aware that businesses are becoming more data-driven and that not utilizing this data can be detrimental to the proper evaluation of risks and controls and, more importantly, meeting stakeholder expectations. Even so, as is underscored in the results of our 2018 Internal Audit Capabilities and Needs Survey, many internal audit departments are still struggling to develop a formal methodology for integrating data analytics into their work. A formal data analytics program has a mission and a purpose. It ensures

repeatability and external reliance. It also specifies how data is to be identified, acquired and analyzed to achieve the specified analytics objective.

These issues are challenging enough, but for CAEs and internal auditors, the demands don't stop there. Cyber security, enterprise risk management, fraud, vendor risk and corporate culture are among numerous areas that dominate 2018 audit plans for organizations worldwide, according to the results of our survey.

In our study this year, we again take a look at how internal audit groups are leveraging analytics in the audit process and where improvements are needed, and we delve into the many priorities internal audit organizations have for the coming year.

Leveraging analytics and robotics are front-burner priorities for chief audit executives and their teams. They are increasingly aware that businesses are becoming more data-driven and that not utilizing this data can be detrimental to the proper evaluation of risks and controls and, more importantly, meeting stakeholder expectations.

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[1] *Executive Perspectives on Top Risks for 2018*, North Carolina State University's ERM Initiative and Protiviti, December 2017, www.protiviti.com/toprisks.

Our Key Findings:

01   **The use of analytics in auditing remains in the early stages —** The maturity of using analytics in the audit process remains relatively low; many audit functions are likely using analytics tools as point solutions as opposed to part of a broader initiative to leverage analytics throughout the audit process.

02   **Audit analytics may be more advanced among European and Asia-Pacific organizations —** These companies appear to be more advanced in numerous audit analytics capabilities relative to organizations in North America, though again, the use of analytics likely is higher for point solutions versus broader programs and initiatives.

03   **There is a correlation between audit committee engagement in analytics and information the committee receives about internal audit's use of analytics —** Our results suggest that if a high level of information is shared with the audit committee regarding the use of analytics in auditing, the committee's overall engagement in the process, which can include its willingness to authorize further investments in analytics, is higher.

04   **Fraud, cyber security threats, third-party risk, ERM and corporate culture are top audit plan priorities —** Organizations are focused most on these areas in their 2018 audit plans. Internal audit functions should determine how to transition to analytics to improve their coverage of these areas.

Top 8 Audit Plan Priorities for 2018:

Overall	CAEs
Fraud risk management	Fraud risk management
Cyber security risk/threat	Cyber security risk/threat
Vendor/third-party risk management	Vendor/third-party risk management
Enterprise Risk Management — Aligning Risk with Strategy and Performance (COSO Enterprise Risk Management Framework)	Enterprise Risk Management — Aligning Risk with Strategy and Performance (COSO Enterprise Risk Management Framework)
Revenue Recognition Standard (Financial Accounting Standards Board (FASB) Accounting Standards Update No. 2014-09)	Auditing corporate culture
Agile risk and compliance	Revenue Recognition Standard (Financial Accounting Standards Board (FASB) Accounting Standards Update No. 2014-09)
Auditing corporate culture	ISO 27000 (information security)
Cloud computing	Cloud computing

Data Analytics and the Audit Process

01 The overall maturity levels of analytics activities within internal audit groups remain relatively low.

02 Based on the survey results, many audit functions are likely using analytics tools as point solutions as opposed to part of a broader initiative to leverage analytics throughout the audit process.

03 Internal audit functions in Europe and the Asia-Pacific region appear to be more mature in their use of data analytics than internal audit groups in North America.

04 There is a correlation between the level of audit committee interest in the use of analytics and the amount/level of information shared with the committee about the use of analytics to support the lifecycle of audit activities.

Note: Throughout this section, we report on results for organizations that use data analytics in the internal audit function (per the response in the table below). We also make some observations with regard to general year-over-year trends and changes based on the prior year findings from our study, as reported in our paper, *Embracing Analytics in Auditing*. However, whereas last year's study consisted primarily of respondents from North America, this year's study is more global in nature, with nearly one in three participants from Asia-Pacific, Europe, India and the Middle East. Therefore, specific year-over-year comparisons of the data would not provide an accurate view of trending in the results.

Current and Planned Adoption of Analytics in Auditing

• • • • **Does the internal audit department currently utilize data analytics as part of the audit process?**

	Asia-Pacific	Europe	North America
Yes	76%	76%	63%
No	16%	14%	27%
Unsure	8%	10%	10%

Organizations in Europe and the Asia-Pacific region are utilizing data analytics in the audit process more frequently. Overall, the number of internal audit departments using data analytics as part of the audit process is not growing — a significant number of organizations have yet to embrace this practice.

Does the internal audit department have plans to implement data analytics as part of the audit process?

Base: Respondents whose internal audit departments do not utilize data analytics as part of the audit process

Yes, we plan to do so within the next year	19%
Yes, we plan to do so within the next two years	47%
No, we do not plan to implement data analytics as part of the audit process	34%

There is a slight uptick in the number of audit groups planning to implement data analytics within the next two years, though it is surprising that one in three organizations have no plans to do so.

Commentary

- In general, the level of sustained adoption of analytics in internal audit is improving but is still not where it should be. CAEs and internal audit leaders need to adopt a mentality oriented more toward accessing and analyzing "data in the business." Currently, many do not understand what to do with analytics, especially in terms of a long-term strategy to transform internal audit into a data-driven function.

- For organizations that have yet to start the journey toward using analytics, one of the most challenging aspects is understanding where to begin. One recommendation, based on observing successful data analytics programs within internal audit, is to start in areas where internal auditors are most comfortable with the data — for example, account

reconciliations, journal entries, payables, fixed assets, payroll, human resources or threshold/limit controls. The internal audit group may find it easier to test data based on information it already knows.

- Internal audit groups continue to face a lack of skills in understanding and using analytics technologies, and more broadly, having a strong level of knowledge in data and business intelligence. CAEs need to focus on increasing the level of education in their internal audit functions, and more specifically, to move from general plans and discussions about using analytics to actually advancing and integrating analytics, robotic process automation (RPA) and other digital initiatives into the audit plan.

One of the most significant challenges CAEs face is a lack of talent with the knowledge and expertise to advance the use of audit analytics significantly and approach it in a more sophisticated manner.
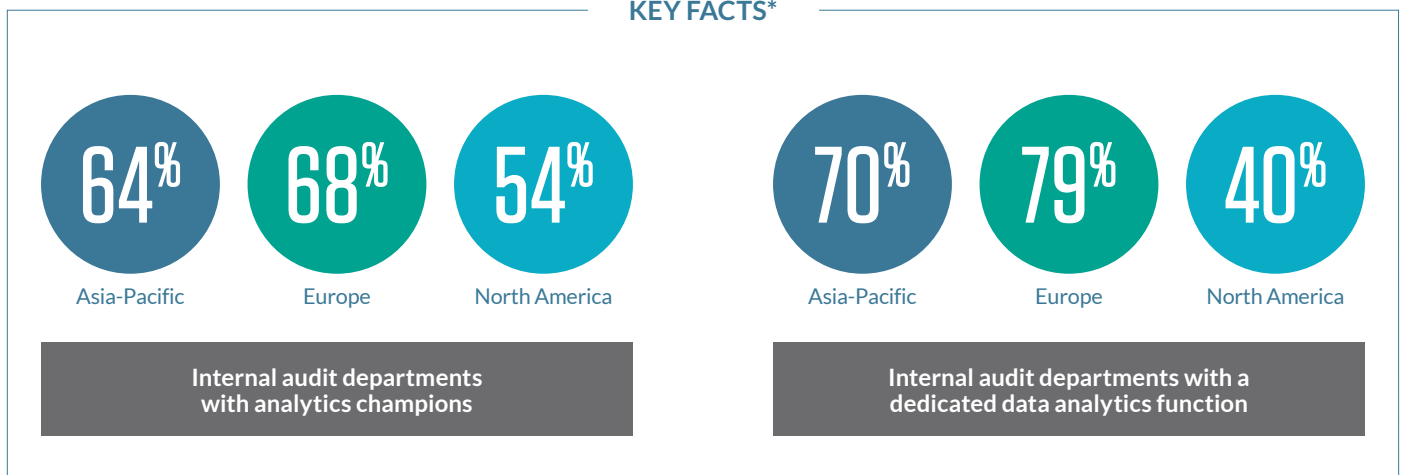
Current State of Analytics Capabilities

• • • **Which of the following statements best defines the current maturity of the data analytics function?***

	Asia-Pacific	Europe	North America
Initial: Ad hoc processes that are undocumented	25%	16%	32%
Repeatable: Process is documented sufficiently so steps can be requested	29%	31%	36%
Defined: Process is defined as a standard business process	18%	28%	18%
Managed: Process is quantitatively managed in accordance with agreed-upon metrics	22%	18%	10%
Optimized: Process management includes deliberate process improvement	6%	7%	4%

Internal audit functions in Europe and the Asia-Pacific region appear to be more advanced in the maturity of their analytics capabilities than are internal audit groups in North America-based organizations.

KEY FACTS*

64%
Asia-Pacific

68%
Europe

54%
North America

Internal audit departments with analytics champions

70%
Asia-Pacific

79%
Europe

40%
North America

Internal audit departments with a dedicated data analytics function

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* Throughout this special section, we present selected findings from organizations that have analytics champions and a dedicated analytics function, and that are at the Managed/Optimized level of maturity with regard to their data analytics capabilities.

What percentage of total audits utilize some form of data analytics?

	All organizations performing analytics	Organizations at Managed/Optimized state of analytics maturity
1%-25%	30%	10%
26%-50%	32%	31%
51%-75%	18%	27%
76%-100%	20%	32%

One in three organizations at a Managed or Optimized state of analytics maturity utilize some form of data analytics in most of their audits — significantly more than organizations at a lower level of analytics maturity.

On a scale of 1 to 10, where "10" is a high level of value and "1" is little or no value, rate the level of value that the internal audit department receives from utilizing data analytics as part of the audit process:

6.8	7.1	7.2	7.8
All organizations performing analytics	Organizations with analytics champions	Organizations with dedicated data analytics function	Organizations at a Managed/Optimized state of analytics maturity
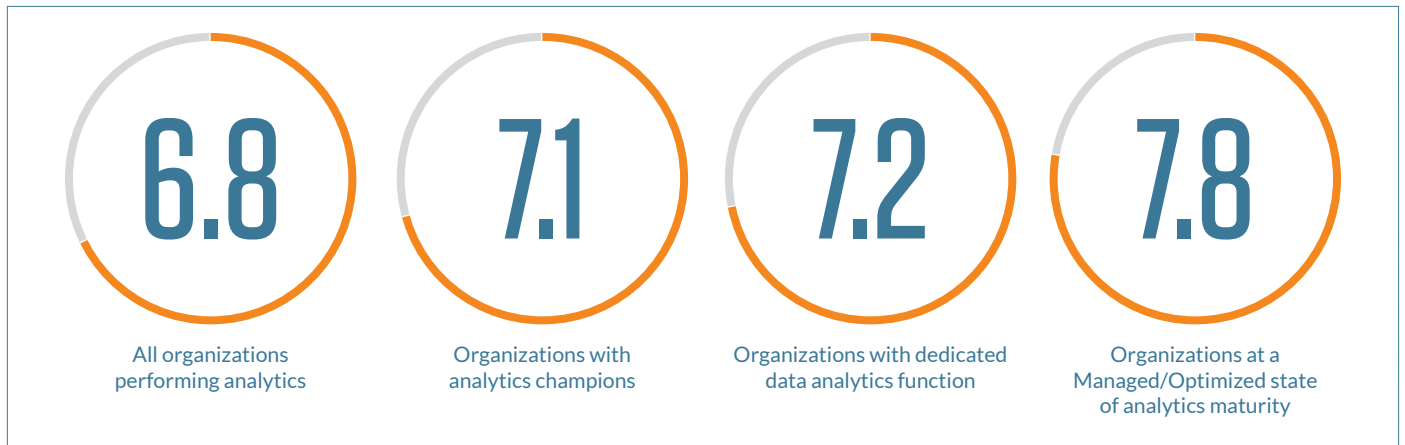
• • • **Compared to one year ago, how has the demand for data analytics services to support audits within the organization changed?**

	All organizations performing analytics	Organizations with analytics champions	Organizations with dedicated data analytics function	Organizations at Managed/ Optimized state of analytics maturity
Increased significantly	24%	30%	33%	34%
Increased somewhat	54%	55%	54%	48%
No change	20%	13%	10%	15%
Decreased	2%	2%	3%	3%

The results indicate that, similar to our prior year results, a majority of analytics functions are at a relatively immature state. While many internal audit functions are making some progress in growing their analytics capabilities, there is more work to do, as it is likely that many are using analytics for specific projects and tasks — i.e., as a point solution — rather than as a broader vision and strategy which will enable a sustainable analytics program over the long term.

Audit Committee Engagement in Analytics

• • • **How much interest has the audit committee shown in the use of analytics to support the lifecycle of audit activities (risk assessment, planning, execution, reporting, monitoring) and the value delivered from analytics?**

	Asia-Pacific	Europe	North America
High level of interest from the audit committee (e.g., routine inquiries on use of analytics and value delivered, expectations of significant use)	35%	37%	21%
Medium level of interest from the audit committee (e.g., periodic inquiries, some interest in understanding use and value of analytics)	50%	47%	39%
No interest/low level of interest from the audit committee	11%	8%	20%
Don't know	4%	8%	20%

• • • How much interest has the audit committee shown in the use of analytics to support the lifecycle of audit activities (risk assessment, planning, execution, reporting, monitoring) and the value delivered from analytics?

	All organizations performing analytics	Organizations with analytics champions	Organizations with dedicated data analytics function	Organizations at Managed/ Optimized state of analytics maturity
High level of interest from the audit committee (e.g., routine inquiries on use of analytics and value delivered, expectations of significant use)	27%	35%	39%	55%
Medium level of interest from the audit committee (e.g., periodic inquiries, some interest in understanding use and value of analytics)	41%	41%	41%	24%
No interest/low level of interest from the audit committee	17%	13%	7%	4%
Don't know	15%	11%	13%	17%

"[There] has been keen interest by the audit committee [in the use of analytics in the audit process], mainly because of external audit firms employing these techniques."

— Chief audit executive, technology company, North America

How much information is shared with the audit committee about the use of analytics to support the lifecycle of audit activities and the value delivered from analytics?

	Asia-Pacific	Europe	North America
High level of information shared with the audit committee (e.g., analytics and visualizations incorporated into routine reporting to audit committee, information about the analytics function shared routinely)	33%	33%	20%
Medium level of information shared with the audit committee (e.g., analytics embedded within broader reporting of audit observations)	57%	58%	51%
No information/low level of information shared with the audit committee	9%	7%	21%
Don't know	1%	2%	8%

	All organizations performing analytics	Organizations with analytics champions	Organizations with dedicated data analytics function	Organizations at Managed/ Optimized state of analytics maturity
High level of information shared with the audit committee (e.g., analytics and visualizations incorporated into routine reporting to audit committee, information about the analytics function shared routinely)	26%	32%	38%	53%
Medium level of information shared with the audit committee (e.g., analytics embedded within broader reporting of audit observations)	52%	53%	51%	41%
No information/low level of information shared with the audit committee	16%	10%	6%	2%
Don't know	6%	5%	5%	4%

⋅ ⋅ ⋅ Relationship between audit committee interest in analytics and level of information shared with the audit committee about the use of analytics in auditing activities:

	No interest/low level of interest from the audit committee in use of analytics	Medium level of interest from the audit committee in use of analytics	High level of interest from the audit committee in use of analytics
High level of information shared with the audit committee (e.g., analytics and visualizations incorporated into routine reporting to audit committee, information about the analytics function shared routinely)	4%	13%	59%
Medium level of information shared with the audit committee (e.g., analytics embedded within broader reporting of audit observations)	31%	71%	37%
No information/low level of information shared with the audit committee	61%	9%	1%
Don't know	4%	7%	3%

There is a clear correlation between the audit committee's level of interest in the use of analytics to support the lifecycle of audit activities and the amount of information shared with the committee about the use of analytics in auditing activities.

"We transitioned a very mature data analytics capability (four additional people) out of audit to a center of excellence, so we are now less focused on helping the business and primarily focused on meeting our audit needs."

— Chief audit executive, consumer packaged goods company, North America

Commentary

- The more information about the use of, and results from, audit analytics that is shared with the audit committee, the more interest the audit committee will have. At the same time, if the audit committee is not seeing information about the use of analytics and the results it is generating, committee members could highlight the absence of analytics to the CAE and internal audit group and direct them to use analytics more, especially as the board observes analytics and robotics employed increasingly throughout the organization.

- The use of analytics and the benefits it is delivering need to be communicated to the audit committee regularly. This is especially vital considering that audit committee members may lack extensive knowledge of analytics and their benefits. By better informing and educating the audit committee about analytics, CAEs will gain the committee's support for further investment in these capabilities, including but not limited to up-front investments to get analytics capabilities up and running.

Profile of the Internal Audit Data Analytics Function[2]

06	11	60	47	11
Average number of years that the dedicated analytics function has been in place	Average number of staff dedicated to the data analytics function	Percentage of organizations planning to add headcount to the data analytics function	Average number of data analytics function hours dedicated to audits that include analytics	Average number of days spent on training and development

Processes supported by the data analytics function:
(Multiple responses permitted)

Audit execution	65%
Audit planning	63%
Continuous auditing	57%
Continuous monitoring/dashboards	46%
Risk assessment	45%
Reporting	42%
Issue tracking/follow-up/validation	39%
Supporting fraud investigations	35%
Department governance	26%

Tasks performed by the data analytics function currently:
(Multiple responses permitted)

Issue/trend analysis	49%
Audit scoping	48%
Testing of entire populations	45%
Risk assessment	45%
Targeted sample selection	45%
Random sampling	42%
Development and/or deployment of continuous auditing tools	39%
Testing of individual controls	33%
Quantification of audit observations	33%
Model validation	33%
Code review	31%

[2] Results among organizations with a dedicated analytics function.

Strategic goals of the data analytics function: *(Multiple responses permitted)*

	All organizations performing analytics	Organizations at Managed/Optimized state of analytics maturity
Increased efficiency	68%	71%
Increased effectiveness	67%	62%
Continuous auditing	63%	68%
Increased audit coverage	59%	60%
Increased value to business	56%	56%
More robust testing	37%	39%
Targeted sample selection (e.g., attribute or risk-based)	34%	39%
Supplying management and the board with more quantifiable observations	31%	37%
Random sampling	30%	33%
Visibility to risk indicators	28%	37%
Supplying management and the board with quantifiable metrics for organizational risks	23%	34%
Meeting heightened expectations	21%	28%
External auditor's request	20%	31%
Regulatory requirement	16%	34%
Model validation	16%	32%

Along with increased maturity in analytics comes an increased focus on, and greater capability to deliver against, more advanced analytics areas, such as quantifiable metrics, regulatory requirements, modeling, etc.

81%

Percentage of organizations in which internal audit staff who are not part of the data analytics function have analytics skills that they employ on their individual audits

75%

Percentage of organizations in Europe and the Asia-Pacific region that are planning to add headcount to the internal audit data analytics function within the next year

While in a strong majority of organizations there are non-analytics internal audit professionals who employ analytics on their individual audits, this figure ideally should be 100 percent. Non-analytics team members should have enough knowledge of what can be accomplished with analytics to help scope future work and advise on opportunities to bring in the analytics group.

Average percentage of time spent by the data analytics function on the following activities:
(Multiple responses permitted)

Ad hoc requests	23%
Individual audit support	22%
Building/administering monitoring tools	18%
Administrative activities	16%
Other strategic tasks to advance the analytics function	14%
Supporting organization's data analytical needs outside of internal audit	13%

The relatively high percentage of time spent on ad hoc requests underscores the point that many analytics activities are focused on point solutions versus broader initiatives to leverage analytics throughout the audit process. However, a certain level of activity devoted to ad hoc requests is positive, as it offers opportunities for more data mining and data exploration.

• • • Average budget (in terms of hours) for the data analytics function's support:

	Asia-Pacific	Europe	North America
Less than 20 hours	11%	13%	26%
20 to 40 hours	52%	54%	40%
40 to 100 hours	33%	25%	24%
More than 100 hours	4%	8%	10%

• • • Estimated days per year invested in training and development for the data analytics function:

Less than 5 days	20%
5 to 9 days	45%
10 to 20 days	25%
More than 20 days	10%

• • • Defined data analytics groups for other functions in the organization (outside of internal audit):

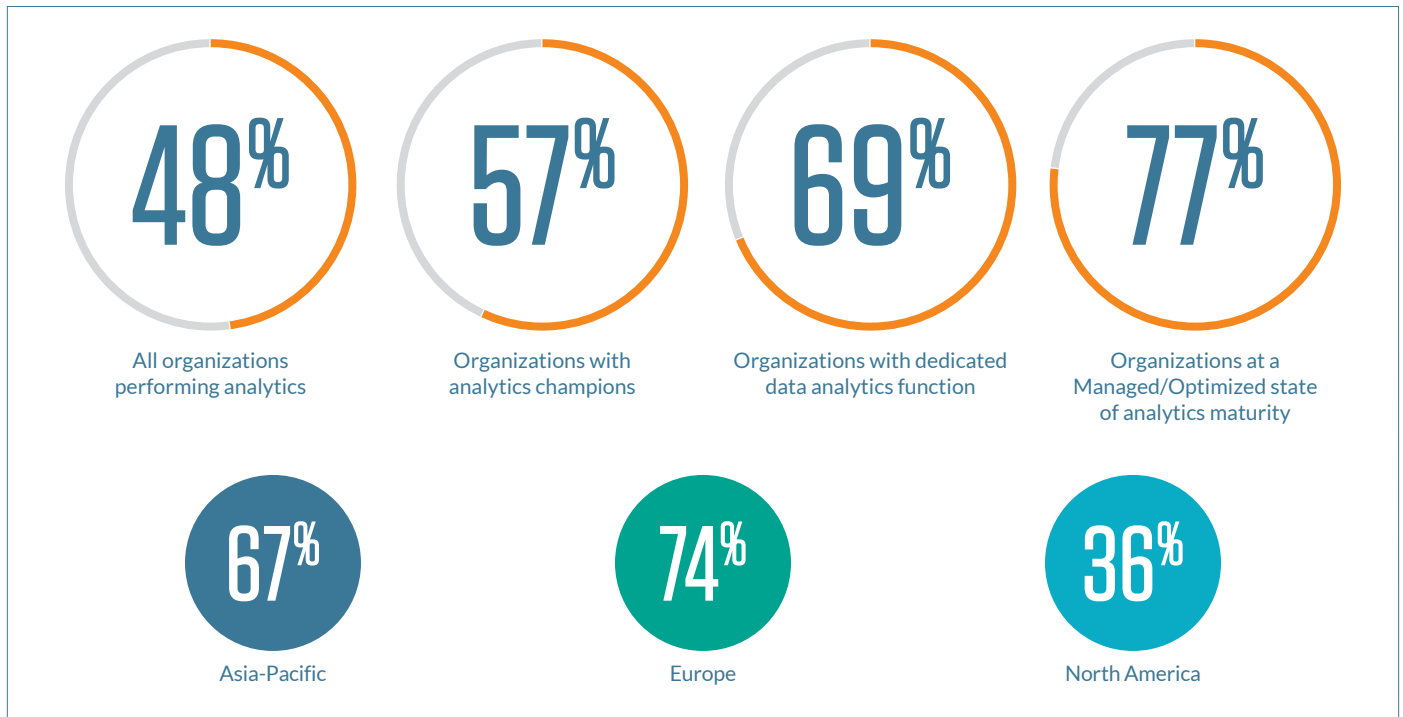|	
Compliance	40%
Risk	39%
First-time functions	37%

> External auditors increasingly are developing and employing analytics tools, thus requests from the external auditor to have internal audit use analytics in the audit process likely will increase.

Assessing Data Practices

• • • **Organizations in which internal audit has its own data warehouse, or a similar dedicated environment, for accessing organizational data:**

48%	**57%**	**69%**	**77%**
All organizations performing analytics	Organizations with analytics champions	Organizations with dedicated data analytics function	Organizations at a Managed/Optimized state of analytics maturity

67%	**74%**	**36%**
Asia-Pacific	Europe	North America

Substantially higher numbers of internal audit groups in Asia-Pacific and Europe have their own data warehouses compared with internal audit departments in North America.

• • • **Top challenges in gaining access to data within the organization:**

Coordination with corporate IT	58%
Identification of where data resides	55%
System constraints	52%
Data elements not currently captured	47%
Confidentiality/privacy safeguards	41%

How would you rate the organization's quality of available data for analytics purposes?

	All organizations performing analytics	Organizations with analytics champions	Organizations with dedicated data analytics function	Organizations at Managed/ Optimized state of analytics maturity
Excellent	11%	15%	18%	21%
Very good	27%	32%	37%	45%
Good	37%	35%	32%	29%
Fair	22%	16%	12%	5%
Poor	3%	2%	1%	0%

Organizations that rate the quality of available data for analytics purposes to be excellent or very good

59%
Asia-Pacific

58%
Europe

28%
North America
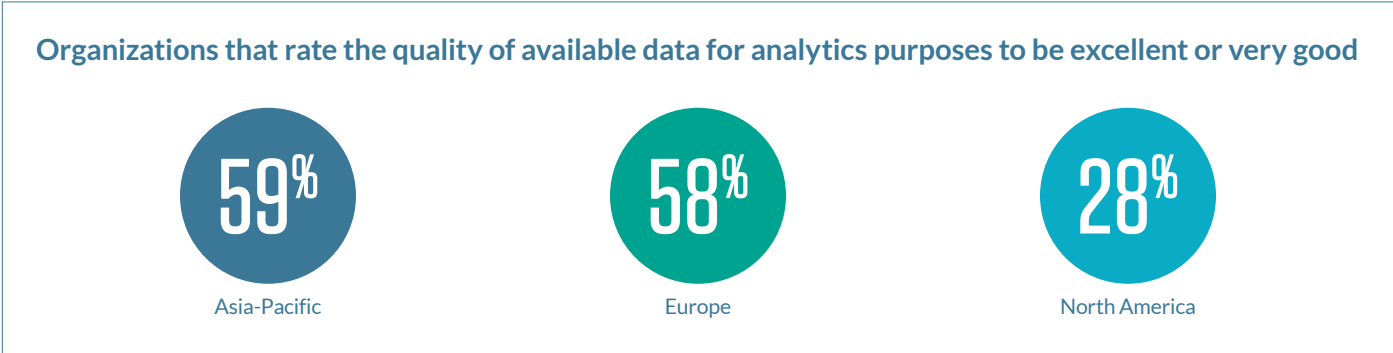
"We are working on establishing a stable and consistent data warehouse so that internal audit is able to use this information in the audit process."

— Chief audit executive, financial services company, North America

Organizations in which the internal audit department has specific and defined protocols for the extraction of data leveraged during the audit process:

58%	68%	77%	83%
All organizations performing analytics	Organizations with analytics champions	Organizations with dedicated data analytics function	Organizations at a Managed/Optimized state of analytics maturity

72%	74%	52%
Asia-Pacific	Europe	North America

Which of the following do the data extraction protocols include?

Base: Internal audit departments that have specific and defined protocols for the extraction of data leveraged during the audit process

Completeness	95%
Data quality	90%
Reliability	88%
Conformity	80%

"The problem with data analytics is that our company does not have good data. Access control and different systems prevent appropriate data analytics. Its use is limited."

— Chief audit executive, financial services company, North America

- • • **In terms of the data utilized in the analytics process, please indicate which of the following you are performing.** *(Multiple responses permitted)*

	Asia-Pacific	Europe	North America
Using internal sources only	62%	49%	87%
Leveraging publicly available external sources	45%	45%	25%
Purchasing external data for use	46%	49%	9%

General year-over-year trends indicate that more internal audit departments are leveraging external data sources, particularly in the Asia-Pacific region and Europe.

Commentary

- Internal audit functions need to partner with technology functions to develop robust processes for data acquisition. Requests for data must be specific and easily understood by technology and business functions. Audit groups that engage better with corporate IT departments and other functions in the organization perform better. Among other advantages, they become more aware of key company initiatives and strategic risks. On the other hand, internal audit groups that fail to align well with other functions are going to struggle more, particularly when it comes to gaining access to the data necessary to perform analytics.

- Another critical area to address is data elements that are not being captured. If internal audit lacks the processes to capture the data necessary to perform

analytics, its efforts will be stalled. Furthermore, considering the role of internal audit in business processes, helping to identify and understand the data required for business intelligence is critical. If internal audit consistently finds that this data does not exist or is not easily accessible, it needs to make recommendations to business leaders and management to address this issue in a timely manner.

- Overall data quality is perceived to be relatively low, though better among organizations at an Optimized or Managed state of maturity, or among those that have analytics champions or a dedicated analytics function. Data quality is another area about which internal audit has an obligation to raise concerns with management and the audit committee.

Those that fail to focus on incorporating data analytics and robotics into their auditing practices risk becoming obsolete as their organizations continue to undergo digital transformation at an increasingly rapid pace and seek analytics-related support from internal audit.

Continuous Auditing

· · · Organizations in which the internal audit department is employing continuous auditing:

58%	67%	78%	88%
All organizations performing analytics	Organizations with analytics champions	Organizations with dedicated data analytics function	Organizations at a Managed/Optimized state of analytics maturity

74%	79%	48%
Asia-Pacific	Europe	North America

> Europe- and Asia-Pacific-based companies are significantly more likely to employ continuous auditing than North America-based organizations. There may be a correlation between these companies being more likely to have their own data warehouse (see page 16) and conducting more continuous auditing, as that allows them more controllability of the data sets.

· · · Which of the following statements best describes the internal audit department's progress in building continuous auditing tools?

Base: Organizations in which internal audit is employing continuous auditing

We have a very mature process with access to usable dashboards, drilldown capabilities, etc., covering many areas of the business	30%
We have built some pilot tools that we have been using successfully and have a specific roadmap for the build/rollout of many others	51%
We have specific plans of what we are going to do, how and when, but we do not currently have something in use	19%

• • • Which of the following activities is continuous auditing used for? *(Multiple responses permitted)*

Base: Organizations in which internal audit is employing continuous auditing

Audit planning/scoping	69%
Risk assessment input	66%
Valuation of risk control self-assessments monitoring key risk indicators	50%

• • • Which of the following do you currently monitor? *(Multiple responses permitted)*

Base: Organizations in which internal audit is employing continuous auditing

Fraud risk indicators	62%
Data related to controls in-scope for compliance initiatives	56%
Important KRIs in operational processes	56%
Specific areas where there are known issues	44%
Information used for monitoring and strategic decision-making by management	41%

• • • Who provided input into determining what continuous auditing tools are being built and/or used? *(Multiple responses permitted)*

Base: Organizations in which internal audit is employing continuous auditing

Analytics team	50%
IT auditors	44%
Business process auditors	43%
Business area owners	40%
Compliance	35%
Industry peers	19%
Third-party consultants	14%

• • • **Which of the following individuals/groups provided input into determining what data is being monitored by continuous auditing tools?** *(Multiple responses permitted)*

Base: Organizations in which internal audit is employing continuous auditing

Analytics team	52%
Business process auditors	45%
Business area owners	45%
IT auditors	40%
Compliance	38%
Industry peers	15%
Third-party consultants	8%

Commentary

• The results for the level of continuous auditing in organizations, particularly for those in the Europe and Asia-Pacific regions, suggest that internal audit is recognizing the need to leverage technology and is implementing continuous auditing where it sees opportunities to do so. Yet further growth is warranted, especially in North America, considering the depth and breadth of digitalization and business transformation initiatives underway.

"The big challenge we have is the location of the data. We have multiple databases that all have different protocols. It is difficult to have requests prioritized, so we try to get data ourselves and it is difficult to validate the completeness."

— Chief audit executive, government organization, North America

10 Data Analytics Action Items for CAEs and Internal Audit

01   Recognize that the demand for data analytics in internal auditing is growing across all organizations and industries. This trend is certain to continue as more organizations undergo business and digital transformation initiatives and employ RPA, and as regulators increasingly call for organizations to use analytics.

02   Seek out opportunities to expand internal audit's knowledge of sophisticated data analytics capabilities so that the function has a more comprehensive and precise understanding of what is possible with analytics, what similar organizations are doing with analytics, as well as what progress is needed to advance these capabilities.

03   Understanding that budget and resource constraints, along with business-as-usual workloads, can limit internal audit's ability to optimize its data analytics efforts, try conducting even modest demonstrations of analytics capabilities that can set an influential tone and are positive steps toward building a stronger internal audit data analytics function.

04   Consider the use of champions to lead the analytics effort and, when appropriate, create a dedicated analytics function. Having champions helps to bridge the gap between the analytics function and operational auditors. It also encourages the use of analytics, including basic usage by the whole team. Compared to other organizations, those with analytics champions and dedicated analytics functions in place deliver more value, experience higher demand for their analytics services and obtain better access to higher-quality data.

05   Explore avenues to expand internal audit's access to quality data, and implement protocols (including those related to completeness, conformity, data quality and reliability) that govern the extraction of data used during the audit process.

06   Identify new data sources, both internal and external, that can enhance internal audit's view of risk across the organization.
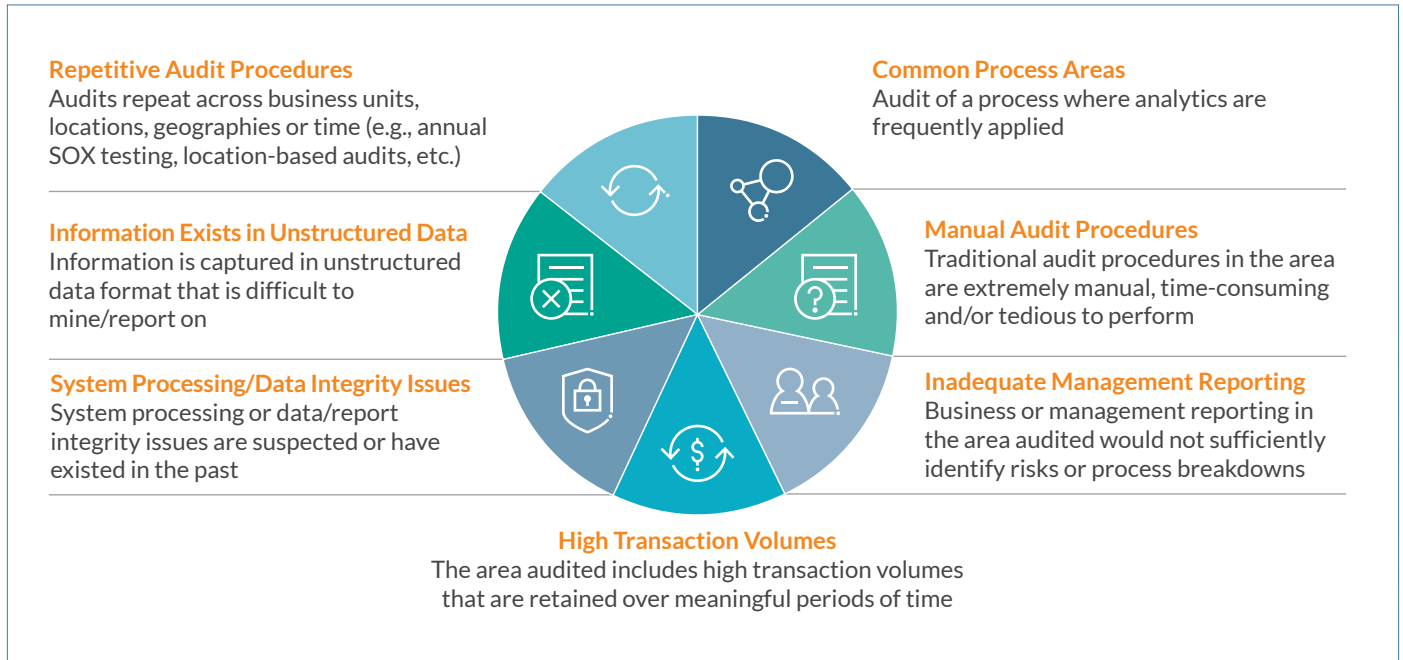
07   Increase the use and reach of continuous auditing and monitoring to perform activities such as monitoring fraud indicators, KRIs in operational processes and information used in the leadership team's strategic decision-making activities.

08   Leveraging continuous auditing, develop real-time snapshots of the organization's risks and incorporate results into a risk-based audit approach that is adaptable and flexible enough to focus on the highest areas of risk at any point in time.
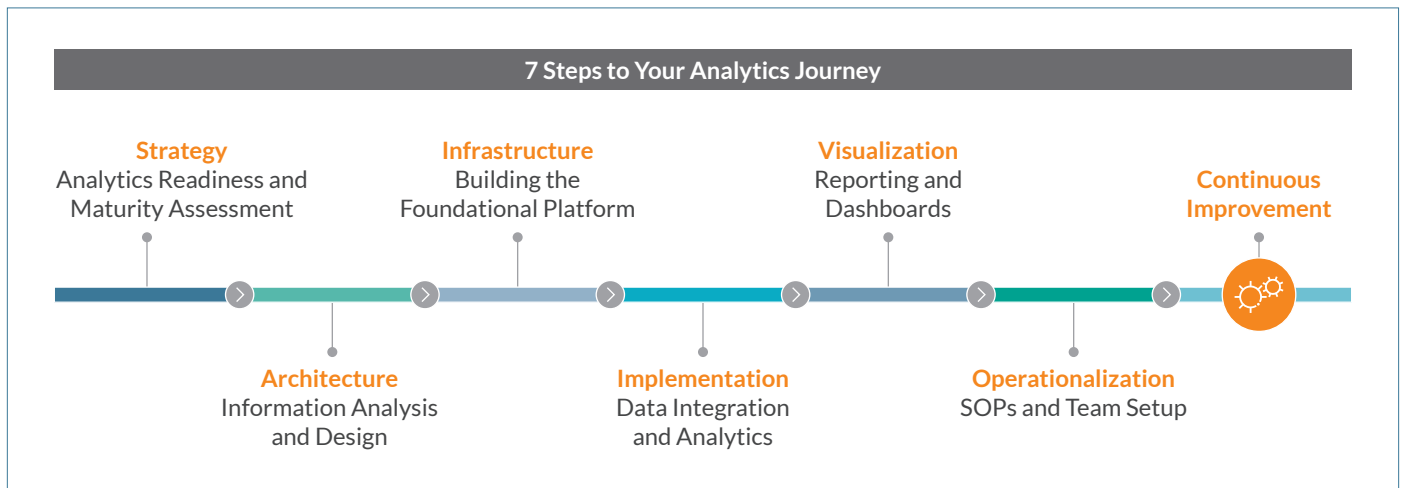
09   Seek ways to increase the level of input stakeholders provide when building and using continuous auditing tools and when determining what data should be monitored by these tools. It is important that the effort is focused on building tools that internal audit can leverage to monitor risk in the business. Many different stakeholders have important insights to help determine areas of focus.

10   Implement steps to measure the success of your data analytics efforts, and also consider the most effective ways to report success and value to management and other key stakeholders. Internal audit groups that can successfully demonstrate tangible value will build a stronger business case for increased budgets and resources dedicated to a data analytics function, as well as underscore throughout the organization the importance of analytics and, in the process, boost internal audit's reputation internally.
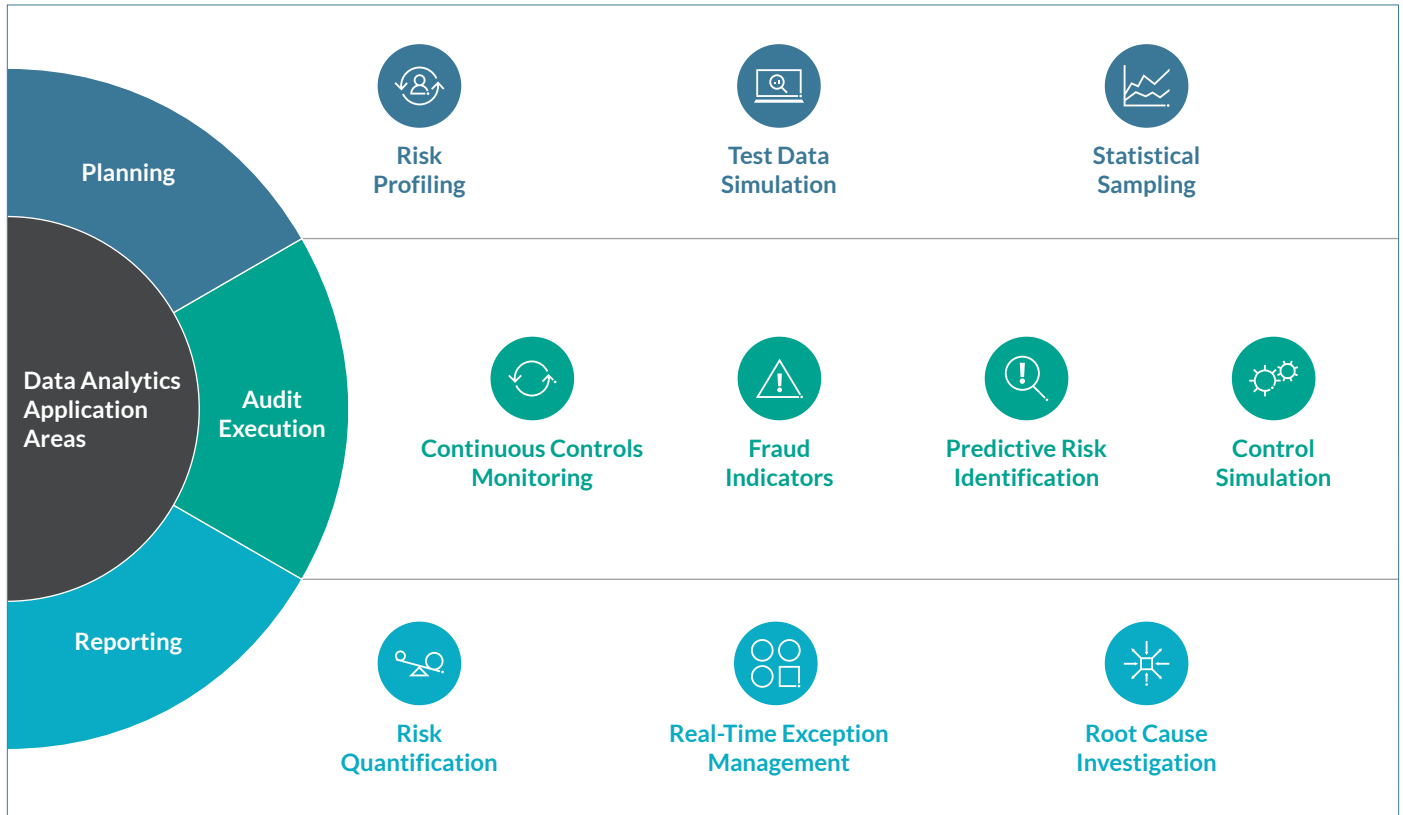
• • • Indicators of Analytics Needs

Repetitive Audit Procedures
Audits repeat across business units, locations, geographies or time (e.g., annual SOX testing, location-based audits, etc.)

Common Process Areas
Audit of a process where analytics are frequently applied

Information Exists in Unstructured Data
Information is captured in unstructured data format that is difficult to mine/report on

Manual Audit Procedures
Traditional audit procedures in the area are extremely manual, time-consuming and/or tedious to perform

System Processing/Data Integrity Issues
System processing or data/report integrity issues are suspected or have existed in the past

Inadequate Management Reporting
Business or management reporting in the area audited would not sufficiently identify risks or process breakdowns

High Transaction Volumes
The area audited includes high transaction volumes that are retained over meaningful periods of time

• • • Analytics Program Services

7 Steps to Your Analytics Journey

Strategy
Analytics Readiness and Maturity Assessment

Infrastructure
Building the Foundational Platform

Visualization
Reporting and Dashboards

Continuous Improvement

Architecture
Information Analysis and Design

Implementation
Data Integration and Analytics

Operationalization
SOPs and Team Setup

• • • **The Analytics Advantage**

Data Analytics Application Areas

Planning
- Risk Profiling
- Test Data Simulation
- Statistical Sampling

Audit Execution
- Continuous Controls Monitoring
- Fraud Indicators
- Predictive Risk Identification
- Control Simulation

Reporting
- Risk Quantification
- Real-Time Exception Management
- Root Cause Investigation

"In a digital world, the future auditor recognizes the opportunity to embrace analytics if he/she has yet to embark on that journey. The 'analog' approach to auditing has little use in an increasingly digital world."

— "The Future Auditor's Advancement of the Audit Committee Relationship," *The Bulletin* (Vol. 6, Issue 7), Protiviti, www.protiviti.com/bulletin.

METHODOLOGY

For the following sections, respondents were asked to assess, on a scale of 1 to 5, their competency in different areas of knowledge important to internal auditing, with "1" being the lowest level of competency and "5" being the highest. For each area, they were then asked to indicate whether they believe their level of knowledge is adequate or requires improvement, taking into account the circumstances of their organization and industry. In addition, for applicable areas, respondents were asked to indicate whether they are included in the organization's 2018 audit plan.

In this year's report, we have taken a different approach to presenting these results. Whereas in prior years we reported them under our standard categories (General Technical Knowledge and Audit Process Knowledge), this year we have grouped the different areas of competency under the following topics:

- **Cyber Security**
- **Analytics and Technology**
- **Culture and Fraud**
- **Strategy and Risk**
- **Accounting, Internal Controls and Audit Processes**
- **Personal Skills and Capabilities**

Cyber Security

Key Findings:

01

As expected, cyber security is included in a strong majority of audit plans this year, and most internal audit functions are adhering to a specific cyber security framework as part of these plans.

02

A majority of internal audit shops indicate a need to deepen their skills across the range of cyber security frameworks, including NIST and ISO 27000.

03

Though falling just below the top five priorities in the category, vendor and third-party risk management remains a critical issue for internal auditors, as evidenced by the frequency of its inclusion in the audit plan.
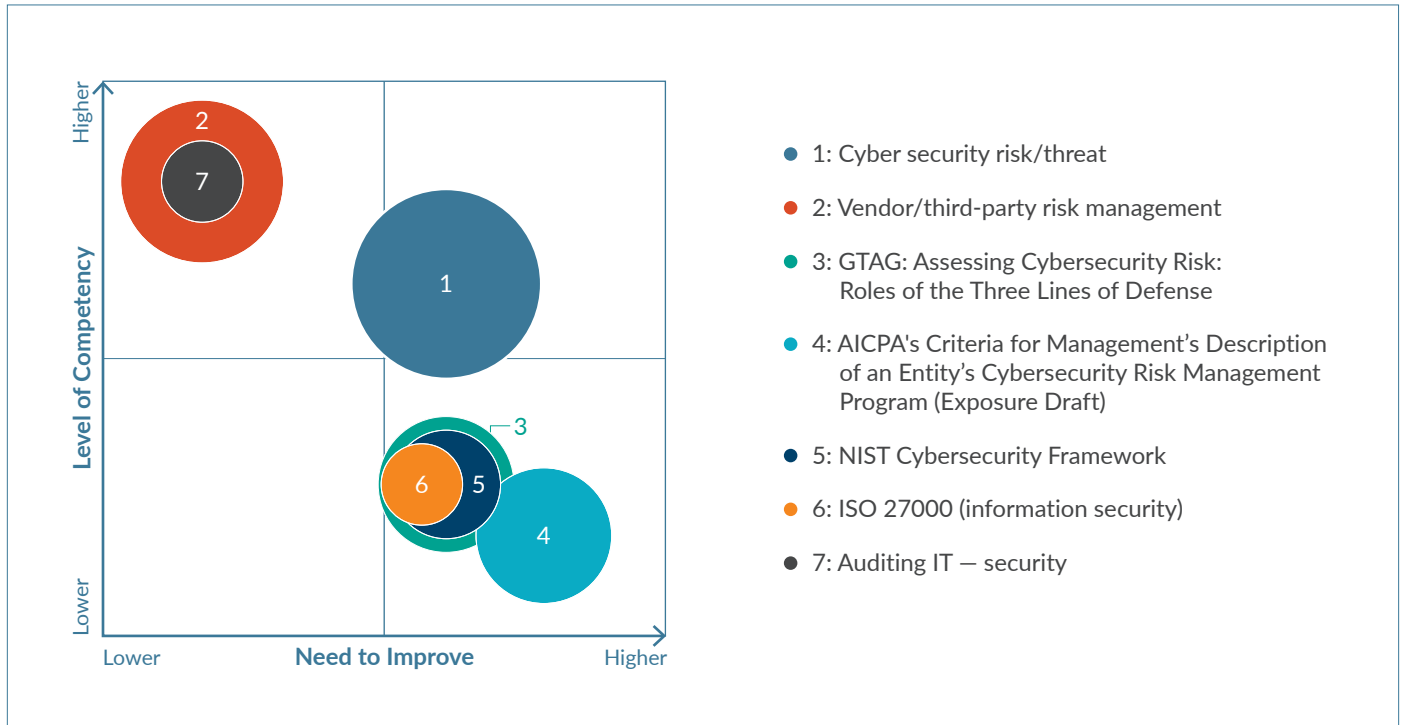
- - - **Overall Results, Cyber Security Competencies**

"Need to Improve" Rank	Areas Evaluated by Respondents	Competency Score (5-pt. scale)
1	AICPA's Criteria for Management's Description of an Entity's Cybersecurity Risk Management Program (Exposure Draft)	2.2
2	GTAG: Assessing Cybersecurity Risk: Roles of the Three Lines of Defense	2.3
3	NIST Cybersecurity Framework	2.3
4	Cyber security risk/threat	2.7
5	ISO 27000 (information security)	2.3

- - - **CAE Results, Cyber Security Competencies**

"Need to Improve" Rank	Areas Evaluated by Respondents	Competency Score (5-pt. scale)
1	AICPA's Criteria for Management's Description of an Entity's Cybersecurity Risk Management Program (Exposure Draft)	2.4
2	GTAG: Assessing Cybersecurity Risk: Roles of the Three Lines of Defense	2.6
3	NIST Cybersecurity Framework	2.6
4	ISO 27000 (information security)	2.5
5	Cyber security risk/threat	3.0

Cyber Security Perceptual Map — Assessing Audit Plan Priorities and Competency Gaps

- 1: Cyber security risk/threat
- 2: Vendor/third-party risk management
- 3: GTAG: Assessing Cybersecurity Risk: Roles of the Three Lines of Defense
- 4: AICPA's Criteria for Management's Description of an Entity's Cybersecurity Risk Management Program (Exposure Draft)
- 5: NIST Cybersecurity Framework
- 6: ISO 27000 (information security)
- 7: Auditing IT — security

This perceptual map visualizes a comparison between "Competency" and "Need to Improve" ratings. The size of each bubble indicates the overall frequency with which the area is included in the annual audit plan, with larger bubbles indicating greater likelihood the area is in the audit plan.

> Cyber security and the potential for cyber threats to disrupt core operations and damage brand reputation represents the third most critical risk for board members and C-suite executives worldwide, according to the *Executive Perspectives on Top Risks for 2018* study.[3]

3 *Executive Perspectives on Top Risks for 2018*, North Carolina State University's ERM Initiative and Protiviti, www.protiviti.com/toprisks.

Action Items for CAEs and Internal Auditors

- Work with management and the board to develop and/or validate a cyber security strategy and policy, and identify and act on opportunities to improve the organization's ability to identify, assess and mitigate cyber security risk to an acceptable level.

- Recognize that cyber security risk is not only external, but also internal. Assess and mitigate potential threats that could result from the actions of employees or business partners.

- Leverage relationships with the audit committee and board to heighten awareness and knowledge of cyber threats, and ensure the board remains highly engaged with cyber security matters and up-to-date on the changing nature of cyber security risk.

- Ensure cyber security risk is integrated formally into the audit plan.

- Develop, and keep current, an understanding of how emerging technologies and trends are affecting the company and its cyber security risk profile.

- Evaluate the organization's cyber security program against a framework such as the National Institute of Standards and Technology (NIST) Cybersecurity Framework, recognizing that because the framework does not reach down to the control level, your

cyber security program may require additional evaluations using ISO 27001 and 27002. Although these are U.S.-centric, they are viewed as leading practice approaches to assessing cyber threat management processes.

- Seek out opportunities to communicate to management that, with regard to cyber security, the strongest preventative capability has both human and technological aspects — a complementary blend of education, awareness, vigilance and technology tools.

- Emphasize that cyber security monitoring and cyber incident response should be a top management priority — a clear formal escalation protocol can help make the case for (and sustain) this priority.

- Address any IT audit staffing and resource shortages as well as any lack of supporting technology tools, either of which can impede efforts to manage cyber security risk.

- Given the widespread risks to which the organization is exposed through its relationships with vendors and third parties (as well as fourth parties, i.e., a vendor's vendors), ensure a robust vendor risk management process is part of the annual audit plan.

*"Companies today fall into two groups — those that have been breached and know it, and those that have been breached but **don't** know it."*

— "The Cyber Risk Oversight Challenge," *Board Perspectives: Risk Oversight,* Issue 101, Protiviti, www.protiviti.com/board.

Analytics and Technology

01 Robotic process automation, among the top areas in need of improvement, is drawing significant interest from CAEs and internal audit leaders seeking to learn more about how to use it from a business improvement standpoint, as well as how to audit RPA in the organization.

02 The results suggest that internal audit needs to increase its focus and skill levels in cloud computing and big data, considering that a relatively small number of audit shops are including these areas in the annual audit plan.

• • • Overall Results, Analytics and Technology Competencies

"Need to Improve" Rank	Areas Evaluated by Respondents	Competency Score (5-pt. scale)
1	GTAG: Auditing Smart Devices: An Internal Auditor's Guide to Understanding and Auditing Smart Devices	2.1
2	GTAG: Understanding and Auditing Big Data	2.2
3	Auditing process automation/robotic process automation	2.3
4	Internet of Things	2.5
5	Cloud computing	2.5

• • • CAE Results, Analytics and Technology Competencies

"Need to Improve" Rank	Areas Evaluated by Respondents	Competency Score (5-pt. scale)
1	GTAG: Understanding and Auditing Big Data	2.4
2	GTAG: Auditing Smart Devices: An Internal Auditor's Guide to Understanding and Auditing Smart Devices	2.3
3	Internet of Things	2.6
4	Cloud computing	2.7
5 (tie)	Big data/business intelligence	2.6
	Auditing process automation/robotic process automation	2.4
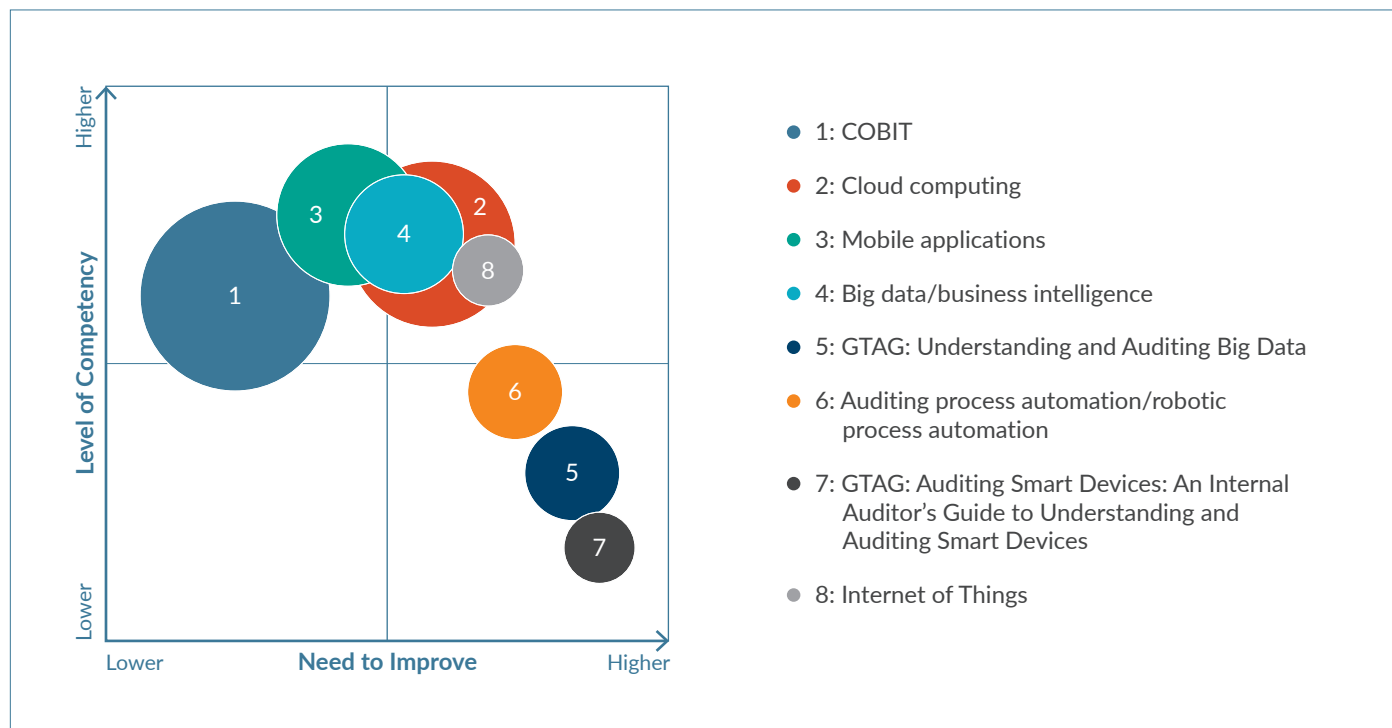
This perceptual map visualizes a comparison between "Competency" and "Need to Improve" ratings. The size of each bubble indicates the overall frequency with which the area is included in the annual audit plan, with larger bubbles indicating greater likelihood the area is in the audit plan.

Action Items for CAEs and Internal Auditors

- Develop a plan for the internal audit function to become more digital by increasing the use of automation, RPA and analytics, which will improve the function's auditing capabilities and help it transition from sampling (either paper-based or data).

- Consider that, sooner or later, performing data analytics and continuous auditing will not be limited to technical specialists. The goal should be to train all internal audit professionals in analytics and continuous auditing technologies and practices.

- Remain vigilant of new technologies being deployed in the organization, including but not limited to those coming from shadow IT and rogue IT initiatives. These may warrant internal audit's involvement from a risk-and-control (and possibly a regulatory compliance) perspective. Schedule and conduct periodic risk assessments and seek to become more involved during the pre-implementation stages.

- Assess how different functions in the organization are undertaking digital transformation initiatives, including the potential risks these projects create, and ensure management and the board are well-informed.

- According to Protiviti's latest survey on technology trends, a majority of companies are focusing on and investing in cloud adoption, digitalization and data projects. In light of this, consider if internal audit is keeping pace in terms of transforming the function and developing the requisite skills and talent.

Culture and Fraud

01 Not surprisingly, CAEs and internal audit professionals are targeting corporate culture as a top area for improvement. For many organizations, culture audits are new endeavors. Senior management and boards are looking to internal audit leaders to help the business develop the right approach for, and get the most value from, these types of audits.

02 Worldwide, fraud risk management represents the area included most frequently in the annual audit plan. In a large percentage of instances involving breakdowns in corporate culture or in the conduct at the top or throughout the organization, one or more fraud-related activities drive those issues. This underscores the need for robust fraud risk management practices, including board oversight and senior management responsibilities.
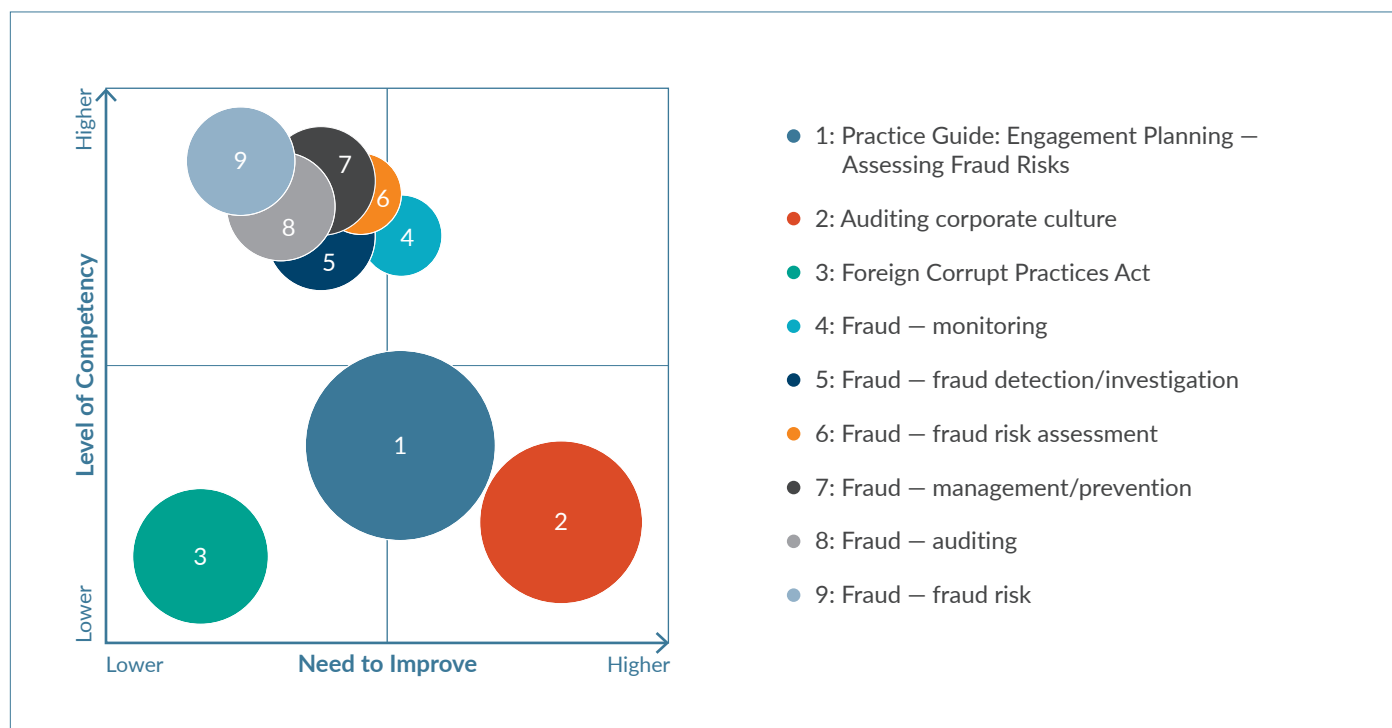
Overall Results, Culture and Fraud Competencies

"Need to Improve" Rank	Areas Evaluated by Respondents	Competency Score (5-pt. scale)
1	Auditing corporate culture	2.7
2	Fraud — monitoring	3.0
3	Practice Guide: Engagement Planning — Assessing Fraud Risks	2.8
4	Fraud — fraud risk assessment	3.0
5	Fraud — fraud detection/investigation	3.0

CAE Results, Culture and Fraud Competencies

"Need to Improve" Rank	Areas Evaluated by Respondents	Competency Score (5-pt. scale)
1	Auditing corporate culture	2.9
2	Practice Guide: Engagement Planning — Assessing Fraud Risks	3.0
3	Fraud — fraud detection/investigation	3.3
4	Fraud — fraud risk assessment	3.3
5	Fraud — monitoring	3.3

Culture and Fraud Perceptual Map — Assessing Audit Plan Priorities and Competency Gaps

Chart axes: Vertical axis labeled "Level of Competency" (Lower to Higher). Horizontal axis labeled "Need to Improve" (Lower to Higher).

Legend:
- 1: Practice Guide: Engagement Planning — Assessing Fraud Risks
- 2: Auditing corporate culture
- 3: Foreign Corrupt Practices Act
- 4: Fraud — monitoring
- 5: Fraud — fraud detection/investigation
- 6: Fraud — fraud risk assessment
- 7: Fraud — management/prevention
- 8: Fraud — auditing
- 9: Fraud — fraud risk

This perceptual map visualizes a comparison between "Competency" and "Need to Improve" ratings. The size of each bubble indicates the overall frequency with which the area is included in the annual audit plan, with larger bubbles indicating greater likelihood the area is in the audit plan.

Action Items for CAEs and Internal Auditors

- Given that corporate culture is linked inextricably with fraud risk in the organization, take steps to create a "best-in-class" fraud risk management program, including but not limited to actions such as the following:

  - Map and analyze the fraud risk management process for improvement opportunities.

  - Evaluate whether there is proper oversight and assignment of resources for fraud control activities.

  - Create or update the organization's fraud control policy.

- Conduct a survey to understand perceptions about the organization's corporate culture and fraud risk management capabilities.

- Expand documentation and visualization of the organization's fraud risk and controls matrix.

- Assess the organization's list of potential fraud exposures.

- Review the organization's fraud response plan.

- Implement a data analytics framework.

- Enhance awareness of fraud risk through communication with various organizational constituencies.

Strategy and Risk

01 Business and digital transformation stands out as a key priority for internal audit groups, as does agile risk and compliance. Of note, the rapid speed of disruptive innovation represents the top risk issue for board members and C-suite executives in 2018.[4]

02 ERM is a key long-term priority for internal audit functions seeking to become more involved in working with management and the board on the organization's strategic risks.

Overall Results, Strategy and Risk Competencies

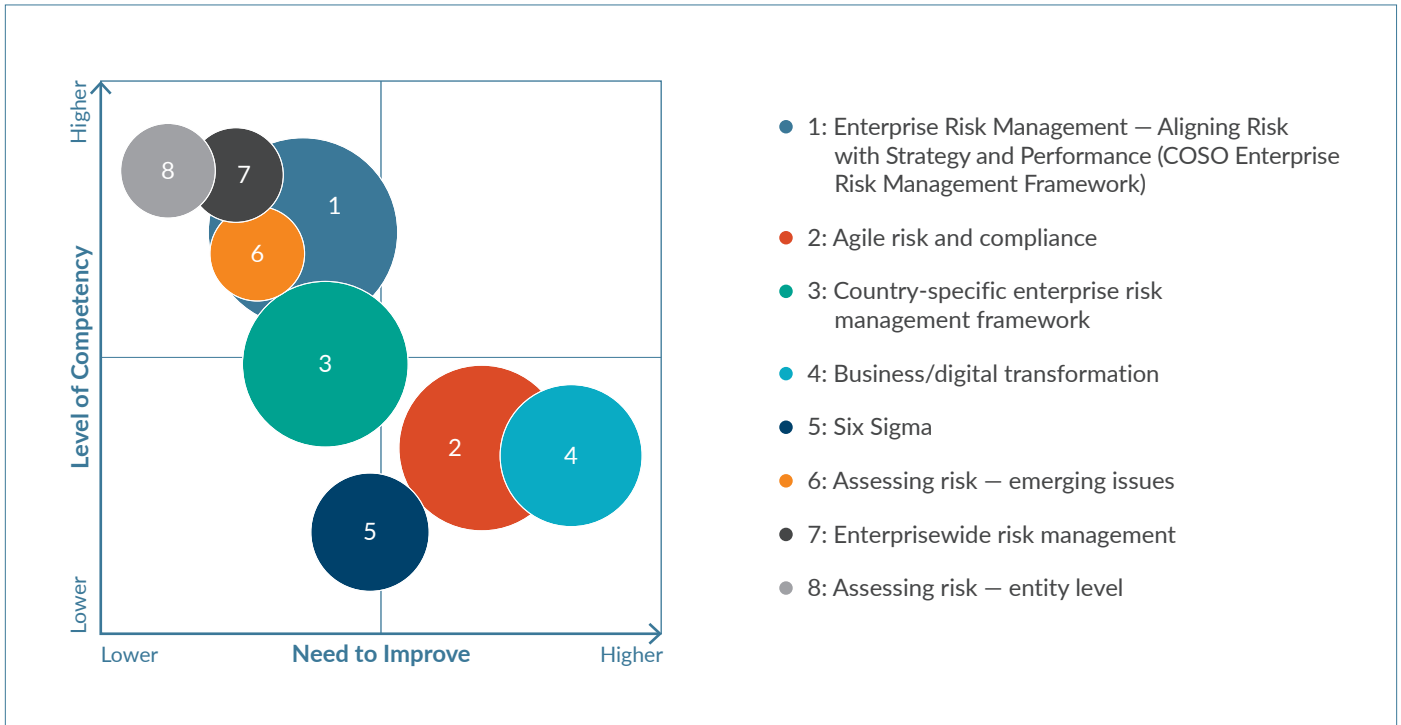| "Need to Improve" Rank	Areas Evaluated by Respondents	Competency Score (5-pt. scale)
1	Business/digital transformation	2.5
2	Agile risk and compliance	2.5
3	Six Sigma	2.3
4	Country-specific enterprise risk management framework	2.6
5	Enterprise Risk Management — Aligning Risk with Strategy and Performance (COSO Enterprise Risk Management Framework)	2.9

CAE Results, Strategy and Risk Competencies

"Need to Improve" Rank	Areas Evaluated by Respondents	Competency Score (5-pt. scale)
1	Agile risk and compliance	2.7
2	Business/digital transformation	2.7
3	Enterprise Risk Management — Aligning Risk with Strategy and Performance (COSO Enterprise Risk Management Framework)	3.3
4	Country-specific enterprise risk management framework	3.1
5	Six Sigma	2.5

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[4] Ibid.

1: Enterprise Risk Management — Aligning Risk with Strategy and Performance (COSO Enterprise Risk Management Framework)

2: Agile risk and compliance

3: Country-specific enterprise risk management framework

4: Business/digital transformation

5: Six Sigma

6: Assessing risk — emerging issues

7: Enterprisewide risk management

8: Assessing risk — entity level

This perceptual map visualizes a comparison between "Competency" and "Need to Improve" ratings. The size of each bubble indicates the overall frequency with which the area is included in the annual audit plan, with larger bubbles indicating greater likelihood the area is in the audit plan.

Action Items for CAEs and Internal Auditors

- Seek to enhance internal audit's focus on strategic risks, in part because this is what internal audit's stakeholders expect. A 2015 survey from The IIA Common Body of Knowledge reported that 7 out of 10 stakeholders want audit leaders to focus on strategic risks (as well as operational, compliance and financial risks) during an audit.[5] Additionally, internal audit is one of the few functions that is not siloed and has a view across all the pillars within the enterprise, from IT to operations and finance. For CAEs and audit leaders, the opportunity to become more engaged with strategic risks is there.

- Focus on establishing strong lines of communication with stakeholders. They are looking to CAEs to initiate and cultivate strong relationships and open lines of communication with executive management and the board of directors to ensure alignment of priorities and appropriate focus on strategic risks. Above all, regular communication with senior management is considered pivotal to the success of any ERM initiative. One of the major benefits of organizations committing time and resources to ERM is being able to reassure both internal and external stakeholders that critical risk management concerns are being addressed.

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[5] *Stakeholders' Advice to the Chief Audit Executive*, Global Internal Audit Common Body of Knowledge 2015 Stakeholder Study, The Internal Audit Foundation and Protiviti, www.theiia.org/CBOK.

- At no time in recent memory has sound ERM guidance been more critical for business success. Amid perceived risk management failures, increasing regulatory scrutiny and growing technology risks, boards are mandating that ERM be a high priority in their organizations. Internal audit should assist the organization with its ERM efforts to address its unique industry and geographical challenges. A working ERM program means that everyone in an organization understands the concepts of risks, shares a common vocabulary, and sees risk assessment, management and mitigation as part of their job. It also means that more opportunities are uncovered, discussed and acted on that will yield new products and markets, better profitability, and a more satisfied workforce.

- Internal audit should play a role in getting ERM to work and evolve to higher levels of effectiveness over time. A risk–informed approach to ERM is an important differentiator that supports an organization's chances of success in achieving its strategic objectives and performance goals. Thoughtful ERM programs help companies anticipate, adapt and respond to change, as well as focus management efforts and resources on the risks and opportunities that truly matter in terms of their impact on strategy and performance.

A Note About COSO's Updated ERM Framework

In September 2017, the Committee of Sponsoring Organizations of the Treadway Commission (COSO) released its updated ERM framework, *Enterprise Risk Management — Integrating Strategy with Performance* (www.coso.org). The framework focuses on integrating ERM with the core processes that matter. Its concept of integration is embodied within its definition of ERM: "The culture, capabilities and practices, integrated with strategy-setting and performance, that organizations rely on to manage risk in creating, preserving, and realizing value."

Accounting, Internal Controls and Audit Processes

Key Findings:

01 Understanding the cloud computing accounting standard represents a key priority for internal audit shops, with competency levels relatively low.

02 Competency levels for the new lease accounting standard are low, especially when contrasted against the level of urgency many organizations are facing to comply with the new standard by the upcoming deadline.
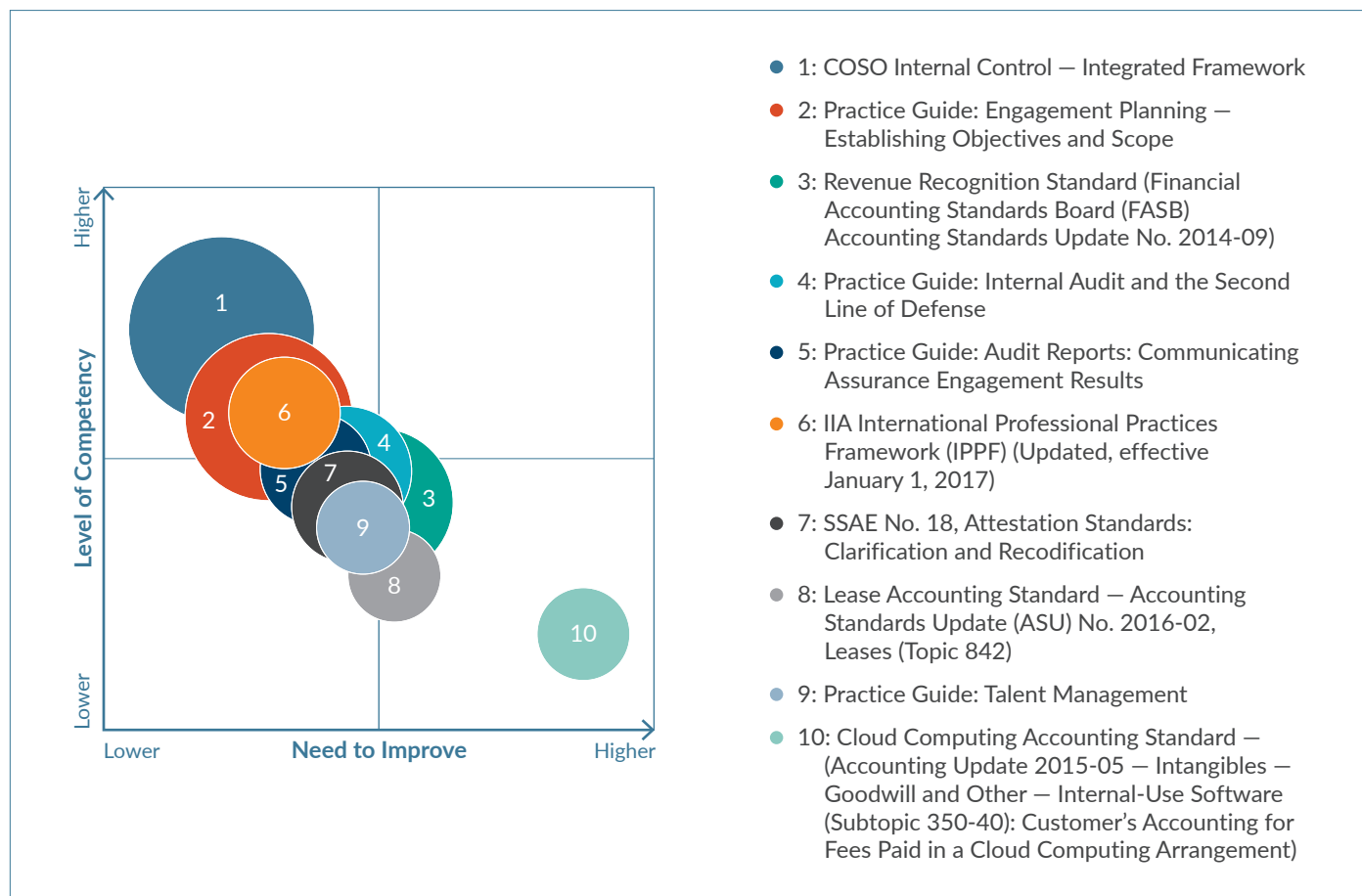
Overall Results, Accounting, Internal Controls and Audit Processes

"Need to Improve" Rank	Areas Evaluated by Respondents	Competency Score (5-pt. scale)
1	Cloud Computing Accounting Standard — (Accounting Update 2015-05 — Intangibles — Goodwill and Other — Internal-Use Software (Subtopic 350-40): Customer's Accounting for Fees Paid in a Cloud Computing Arrangement)	2.1
2	Lease Accounting Standard — Accounting Standards Update (ASU) No. 2016-02, Leases (Topic 842)	2.3
3	Derivatives and hedging — Update No. 2017-12 (Topic 815)	2.2
4	Revenue Recognition Standard (Financial Accounting Standards Board (FASB) Accounting Standards Update No. 2014-09)	2.6
5	Marketing internal audit internally	2.9

CAE Results, Accounting, Internal Controls and Audit Processes

"Need to Improve" Rank	Areas Evaluated by Respondents	Competency Score (5-pt. scale)
1	Cloud Computing Accounting Standard — (Accounting Update 2015-05 — Intangibles — Goodwill and Other — Internal-Use Software (Subtopic 350-40): Customer's Accounting for Fees Paid in a Cloud Computing Arrangement)	2.3
2	Marketing internal audit internally	3.3
3	International Financial Reporting Standards (IFRS)	2.7
4	Practice Guide: Internal Audit and the Second Line of Defense	3.0
5	Lease Accounting Standard — Accounting Standards Update (ASU) No. 2016-02, Leases (Topic 842)	2.6

• • • **Accounting, Internal Controls and Audit Processes Perceptual Map — Assessing Audit Plan Priorities and Competency Gaps**

- 1: COSO Internal Control — Integrated Framework
- 2: Practice Guide: Engagement Planning — Establishing Objectives and Scope
- 3: Revenue Recognition Standard (Financial Accounting Standards Board (FASB) Accounting Standards Update No. 2014-09)
- 4: Practice Guide: Internal Audit and the Second Line of Defense
- 5: Practice Guide: Audit Reports: Communicating Assurance Engagement Results
- 6: IIA International Professional Practices Framework (IPPF) (Updated, effective January 1, 2017)
- 7: SSAE No. 18, Attestation Standards: Clarification and Recodification
- 8: Lease Accounting Standard — Accounting Standards Update (ASU) No. 2016-02, Leases (Topic 842)
- 9: Practice Guide: Talent Management
- 10: Cloud Computing Accounting Standard — (Accounting Update 2015-05 — Intangibles — Goodwill and Other — Internal-Use Software (Subtopic 350-40): Customer's Accounting for Fees Paid in a Cloud Computing Arrangement)

This perceptual map visualizes a comparison between "Competency" and "Need to Improve" ratings. The size of each bubble indicates the overall frequency with which the area is included in the annual audit plan, with larger bubbles indicating greater likelihood the area is in the audit plan.

Action Items for CAEs and Internal Auditors

- Recognize that in regard to accounting and financial reporting, internal auditors are operating in a more dynamic environment than at any time in recent memory. Gone are the days of so-called traditional accounting standards, practices and guidance, when IT operates on one side of the organization and audit another. Cloud computing and cyber security are among many technology issues about which internal auditors are challenged to keep apprised and well-informed. They also must stay up-to-date with major changes such as derivatives hedging and the new revenue recognition and lease accounting standards.

- Emphasize the critical importance of building knowledge of and expertise in each of the following financial reporting challenges that organizations face in 2018:

  - **Revenue recognition** — The new revenue recognition accounting standard is now in effect for most public companies, with all companies expected to comply by the end of the year. In 2018, audit committees will be monitoring implementation to make sure management is getting the job done during quarterly filings so that there are no surprises or failures when full year financials are reported. Internal audit should consider a pre- or post-implementation review of the adoption of the new standard from two vantage points — whether or not the new revenue recognition rules are being applied appropriately, and whether or not the company has operated, and is operating, a robust methodology for dealing with accounting changes of any kind.

  - **SEC priorities** — In 2017, the U.S. Securities and Exchange Commission (SEC) issued guidance

to audit committees focused on a number of areas. In 2018, internal audit functions should be focused on the stated SEC priorities, which include diversity, non-GAAP disclosures, valuation issues, asset impairments and cyber disclosures. Non-U.S filers can also benefit from understanding these areas of focus for the SEC.

  - **PCAOB audit issues** — Changes to the Public Company Accounting Oversight Board (PCAOB) inspections scope and standards, adopted in 2017, may influence the audit process, which in turn may affect the audit of the company's financial statements. Although the PCAOB does not regulate companies directly, it does regulate external auditors, with a flow-down effect on the companies they audit. External auditors will, for example, need to begin to identify, and publicly disclose, critical audit matters that could affect a company's financial condition. Changes from other international audit regulators are similarly affecting non-U.S. companies.

  - **Lease accounting** — Though not formally in effect for another year, the new lease accounting standard will revolutionize lease accounting for lessees, affecting all companies and organizations — whether public, private or not-for-profit — that lease assets such as real estate, airplanes, ships, and construction, office or manufacturing equipment. The new standard amounts to a significant change in accounting for leases by lessees. Internal auditors need to familiarize themselves with the new standard and get educated as to its impact on the reporting of financial position, statement of earnings, cash flow and required disclosures.[6]

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[6] For more information, read "Here We Go Again — Transitioning to the New Leases Standard," Protiviti, March 1, 2016, available at www.protiviti.com/US-en/insights/transitioning-new-leases-standard.

- When creating risk-based audit plans, CAEs and their audit functions should ensure these plans consider relevant and emerging financial reporting and internal control issues. The pace of change demands internal auditors be more anticipatory, change-oriented and highly adaptive, particularly with respect to how business and IT issues are impacting the world of financial reporting and internal control.

- Given the magnitude and pervasiveness of changes most organizations are undergoing, including the effects of business transformation initiatives driven by advances in digital technology, there is an increased emphasis on internal audit to consider risk-focused activities as part of their operations. The IIA's *Practice Guide: Internal Audit and the Second Line of Defense* offers guidance and recommendations for CAEs and audit practitioners to ensure independence and objectivity

are not compromised in situations where internal audit may be responsible for second line of defense activities. With regard to performing consulting and risk-focused activities while also ensuring independence and objectivity, consider the following actions:

- Leverage technology-enabled auditing to broaden audit and risk coverage and enable more audit emphasis on strategic issues and critical enterprise risks (e.g., self-assessment tools, continuous auditing and computer-assisted auditing techniques, data-mining tools, advanced analytics, and automation of ongoing controls monitoring and issue tracking).

- Evaluate the control structure and identify opportunities to eliminate, simplify, focus and automate controls to maximize cost-effectiveness while also providing reasonable assurance that control objectives are achieved.

The pace of change demands internal auditors be more anticipatory, change-oriented and highly adaptive, particularly with respect to how business and IT issues are impacting the world of financial reporting and internal control.

Personal Skills and Capabilities

Key Findings:

01
For CAEs as well as all internal audit professionals, the top priority for personal skills development is fostering relationships with other board committees (beyond the audit committee).

• • • **Overall Results, Personal Skills and Capabilities Competencies**

"Need to Improve" Rank	Areas Evaluated by Respondents	Competency Score (5-pt. scale)
1	Developing other board committee relationships	2.8
2	Presenting (public speaking)	3.1
3	Negotiation	3.0
4	Using/mastering new technology and applications	3.0
5	Persuasion	3.0

• • • **CAE Results, Personal Skills and Capabilities Competencies**

"Need to Improve" Rank	Areas Evaluated by Respondents	Competency Score (5-pt. scale)
1	Developing other board committee relationships	3.2
2	Using/mastering new technology and applications	3.2
3	Presenting (public speaking)	3.4
4	Negotiation	3.3
5	High-pressure meetings	3.4

Action Items for CAEs and Internal Auditors

• Focus on building effective relationships with the audit committee and other board committee members. Strong relationships with the board and senior management are key to addressing many of the internal audit challenges and priorities detailed in our report.

Methodology and Demographics

More than 1,500 respondents (n = 1,511) completed questionnaires for Protiviti's Internal Audit Capabilities and Needs Survey, which was conducted online in the fourth quarter of 2017.

The survey consisted of a series of questions grouped into four divisions:

- Data Analytics and the Audit Process

- General Technical Knowledge

- Audit Process Knowledge

- Personal Skills and Capabilities

Participants were asked to assess their skills and competency by responding to questions concerning nearly 200 topic areas. Respondents from the manufacturing, U.S. financial services and U.S. healthcare industries were also asked to assess industry-specific skills (these findings are available upon request). The purpose of this annual survey is to elicit responses that will illuminate the current perceived levels of competency in the many skills necessary to today's internal auditors, and to determine which knowledge areas require the most improvement.

Survey participants also were asked to provide demographic information about the nature, size and location of their businesses, and their titles or positions within the internal audit department. These details were used to help determine whether there were distinct capabilities and needs among different sizes and sectors of business or among individuals with different levels of seniority within the internal audit profession. All demographic information was provided voluntarily by respondents.

• • • Position

Chief Audit Executive (CAE)	12%
Director of Auditing	9%
IT Audit Director	4%
Audit Manager	20%
IT Audit Manager	7%
Audit Staff	22%
IT Audit Staff	5%
Corporate Management	4%
Management Consultant	2%
Audit Services Contractor	2%
External Public Accountant	1%
Other	12%

Size of Organization (outside of financial services) — by gross annual revenue in U.S. dollars

$20 billion +	12%
$10 billion – $19.99 billion	9%
$5 billion – $9.99 billion	10%
$1 billion – $4.99 billion	25%
$500 million – $999.99 million	13%
$100 million – $499.99 million	16%
Less than $100 million	15%

Financial Services Industry — Size of Organization (by assets under management in U.S. dollars)

More than $250 billion	15%
$50 billion – $250 billion	18%
$25 billion – $50 billion	11%
$10 billion – $25 billion	12%
$5 billion – $10 billion	12%
$1 billion – $5 billion	16%
Less than $1 billion	16%

Industry

Financial Services (U.S.) — Banking	14%		Consumer Packaged Goods	2%
Government/Education/Not-for-profit	10%		Services	2%
Technology (Software/High-Tech/Electronics)	8%		Hospitality	2%
			Power and Utilities	2%
Healthcare (U.S.) — Provider	5%		Real Estate	2%
Insurance (excluding Healthcare Payer)	5%		Transportation and Logistics	2%
Manufacturing (other than Technology)	4%		Biotechnology/Life Sciences/Pharmaceuticals	2%
CPA/Public Accounting/Consulting Firm	4%			
Financial Services (U.S.) — Asset Management	4%		Financial Services (U.S.) — Broker-Dealer	1%
			Telecommunications	1%
Financial Services (U.S.) — Other	3%		Distribution	1%
Financial Services (Non-U.S.) — Banking	3%		Financial Services (Non-U.S.) — Asset Management	1%
Healthcare (Non-U.S.)	3%			
Retail	2%		Chemicals	1%
Automotive	2%		Financial Services (Non-U.S.) — Other	1%
Oil and Gas	2%		Media	1%
Construction	2%		Other	6%
Healthcare (U.S.) — Payer	2%			

• • • Certification

Certified Public Accountant (CPA)/Chartered Accountant (CA)	36%
Certified Internal Auditor (CIA)	34%
Certified Information Systems Auditor (CISA)	23%
Certified Fraud Examiner (CFE)	14%
Certification in Risk Management Assurance (CRMA)	9%
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• • • Type of Organization

Public	42%
Private	37%
Not-for-profit	11%
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Other	2%

• • • Organization Headquarters

North America	69%
Europe	14%
Asia-Pacific	8%
Middle East	3%
India	3%
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