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Business and Digital Transformation's Effects on IT Audit Groups

A Global Look at IT Audit Best Practices — Assessing the International Leaders in an Annual ISACA-Protiviti Survey

Executive Summary

Digital transformation. Migration to cloud. Data compliance. Agile development. Cyber threats. The volume, magnitude and speed of the technological changes underway in organizations today continue to increase in dramatic fashion, from business and digital transformation to the growing complexity of data management. Many of these changes give rise to new risks, which ultimately demand more from IT audit groups: more knowledge, more skills and training, more advanced auditing technology and approaches, more resources, and more interaction between the IT audit function and other business leaders, executives and board members.

The results of the latest global **IT Audit Benchmarking Study** from ISACA and Protiviti paint a vivid picture of the ways IT audit leaders and professionals are succeeding, as well as where they need to "step up their games," especially given the omnipresent nature of digital transformation efforts, cyber security risk and technological advancements. This year's results identify several areas of progress. However, there is still work to be done in order for IT audit functions to deliver the strategic insights and real-time risk advice key stakeholders expect, and also help their organizations address the transformation of legacy technologies and the rapid rise in the number and severity level of cyber security risks.

The analyses of this year's ISACA-Protiviti survey findings will help IT audit leaders and professionals understand and address gaps in their capabilities, elevate IT audit's focus beyond check-the-box compliance, strengthen valuable partnerships with the board and business leaders, demonstrate value in strengthening organizational cyber security, and ultimately, help ensure IT is delivering on current and future business needs while also managing risk to within organizational appetite.

Many IT audit functions concentrate on the basics in IT auditing with regard to areas of focus and frequency. Given the pace of digital transformation and organizational change, however, IT audit groups need to become more agile, dynamic and progressive in the ways they assess potential risk areas in IT initiatives and the overall IT environment.

— Andrew Struthers-Kennedy, Managing Director, Global IT Audit Leader, Protiviti

Our Key Findings

01

Digital transformation and cyber security are influencing IT audit plans significantly — The importance IT audit functions place on security and privacy issues is hardly unexpected, yet the magnitude of this priority has never been greater. IT audit leaders and professionals continue to identify cyber security and privacy as the top technology challenge their organizations face. Furthermore, IT audit plans are being assessed and updated more frequently to address digital transformation efforts under way in most organizations.

02

There is greater visibility and awareness of IT audit's role and responsibilities — Likely driven by the growing volume of technology and digital initiatives, more organizations have a designated IT audit director, and the number of IT audit reports issued relative to all audit reports has risen dramatically in recent years.

03

More partnering and collaboration are needed to counteract silo mindsets and behaviors — The accelerating pace of digital transformation initiatives, the increasing speed with which businesses must exploit new opportunities in the market, the rise of "shadow IT" applications, and the growing use of Agile and DevOps, among many other related factors, require IT audit leaders and professionals to strengthen their collaborations with the IT function, IT compliance groups, other parts of the organization, and the board.

04

IT audit needs to move the needle in boosting engagement with major technology projects — As new technology implementations soar, especially those related to digital transformation, cloud migration, cyber security and mobile, IT audit's involvement throughout the entire project lifecycle is crucial, as is the need for IT audit to have the right technical talent to allow for high-value engagement in these critical activities.

05

Co-sourcing is on the rise, reflecting ongoing resource challenges — The number of companies co-sourcing the IT audit function increased significantly over the past year. That said, a surprisingly high portion of IT audit groups are not tapping external resources or technical specialists (via co-sourcing, outsourcing and/or the use of guest IT auditors) to complement in-house IT audit teams by helping address growing and more complex workloads and alleviate internal skills and expertise shortages. This could represent a barrier to boosting engagement with major technology projects.

Methodology

ISACA and Protiviti partnered to conduct the 7th Annual IT Audit Benchmarking Study in the third and fourth quarters of 2017. This global survey, conducted online, consisted of a series of questions grouped into seven categories:

- Emerging Technology and Business Challenges
- IT Implementation Project Involvement
- IT Audit in Relation to the Overall Audit Department
- Risk Assessment
- Audit Plan
- Cyber Security and the Audit Plan
- Skills, Capabilities and Hiring

More than 1,300 (n = 1,323) executives and professionals, including CAEs as well as IT audit vice presidents and directors, completed our online questionnaire. Detailed respondent demographics can be found on pages 64–66.

Since completion of the survey was voluntary, there is some potential for bias if those choosing to respond have significantly different views on matters covered by the survey from those who did not respond. Therefore, our study's results may be limited to the extent that such a possibility exists. In addition, some respondents answered certain questions while not answering others. There is also a disparity in the number of responses from each geographic region. Despite these inherent limitations, we believe the survey results provide valuable insights regarding IT audit practices in organizations today.

Today's Top Technology Challenges

Asked to identify their top technology challenges, IT audit leaders and professionals cited IT security and privacy/cyber security as their top concerns — by an exceptionally wide margin. This mirrors the findings of a recent global survey of board members and executives, in which cyber threats rank among the top risk issues for organizations.[1]

Other pressing technology challenges include infrastructure management, emerging technology and infrastructure changes (transformation, innovation, disruption), and resource/staffing challenges. In addition to how they are perceived as top technology challenges, these areas portray an interrelated dynamic. Emerging technologies and digital transformation place greater pressure on existing IT infrastructure while giving rise to new cyber security and privacy risks. IT audit functions are becoming increasingly pressed to develop new skills and to acquire additional specialized resources amid fierce competition for this expertise in the market.

IT audit needs to play a central role in helping to fortify organizational cyber security at a time when security risks pervade throughout the entire organization and also extend to third-party vendors and partners. It is incumbent upon the IT audit function to assert and clearly articulate its role — to the rest of the business, executive leadership, and up to the audit committee and board of directors — in periodically testing and evaluating the company's cyber security capability. Of note, our research indicates that in one out of three organizations and nearly half of all large companies, the board has a high level of interest and engagement in information security risks (see page 9).

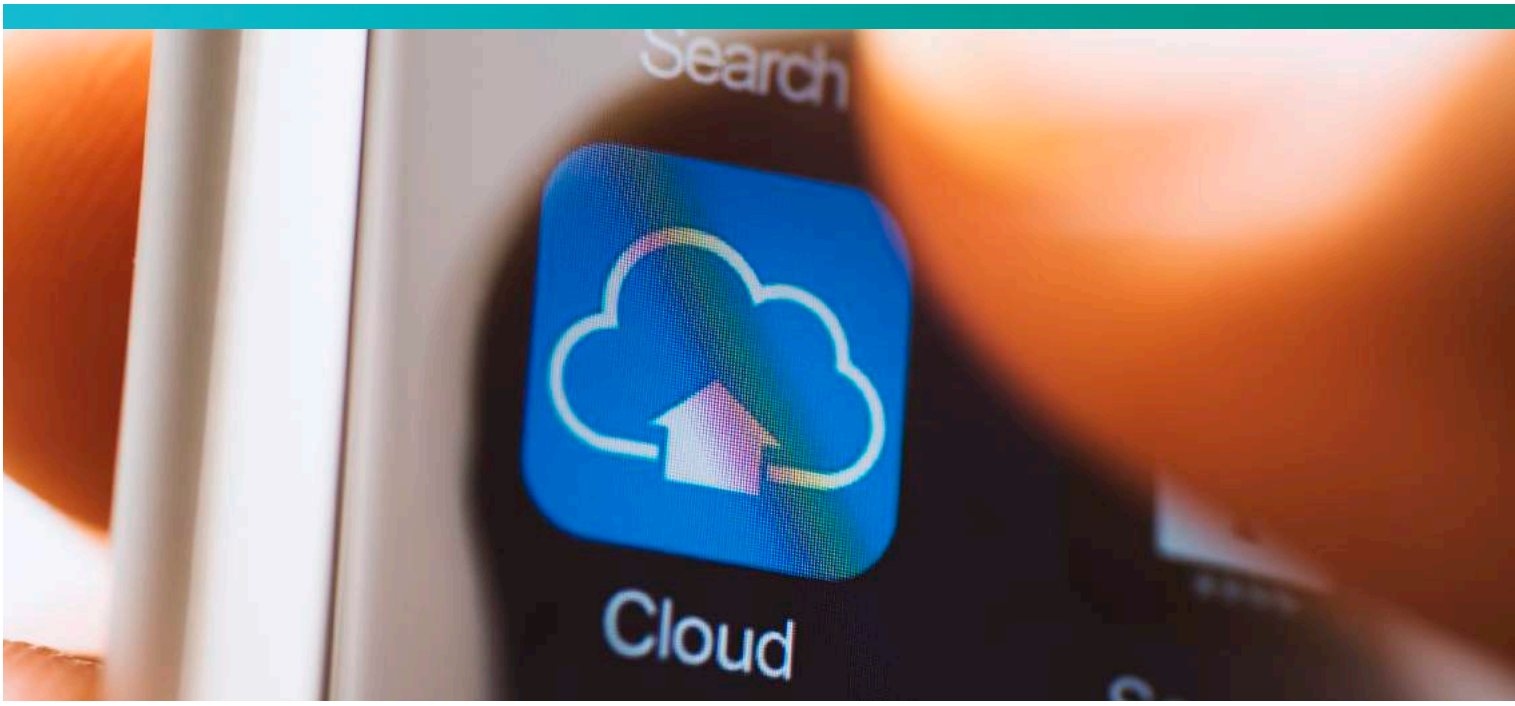
[1] *Executive Perspectives on Top Risks for 2018*, North Carolina State University's ERM Initiative and Protiviti, www.protiviti.com/toprisks.

Cyber security concerns also have brought more attention to vendor risk management, according to the latest Vendor Risk Management Benchmark Study from the Shared Assessments Program and Protiviti.[2] IT auditors are intensifying their scrutiny of vendor- and third-party-related risk. Last year's IT Audit Benchmarking Study marked the first time third-party/vendor management ranked as a top technology challenge, and it ranks even higher this year. This is understandable and a positive development given many companies' growing dependence on cloud-based storage and external data-management vendors. It behooves IT auditors to work closely with business partners — in the IT function and beyond — who increasingly are relying on these vendors to manage data and services and ensure security.

Data management and governance is another technology challenge that has increased in significance over the past year. Technologies and business activities create and capture volumes of data that far exceed the pace at any time previously. As more organizations strive to enhance their data classification and management frameworks, in part to fortify cyber security as effectively and efficiently as possible as well as to ensure their ability to turn masses of data into meaningful business information, IT audit is taking a closer look at the methods deployed for data governance, and also for identifying and protecting the organization's crown jewels — i.e., its most vital and sensitive data.

Current	YOY Trend	2016
IT security and privacy/cyber security	⇔	IT security and privacy/cyber security
Infrastructure management	⇔	Infrastructure management
Emerging technology and infrastructure changes — transformation, innovation, disruption	⇔	Emerging technology and infrastructure changes — transformation, innovation, disruption
Resource/staffing/skills challenges	⇔	Resource/staffing/skills challenges
Regulatory compliance	⇔	Regulatory compliance
Budgets and controlling costs	⇔	Budgets and controlling costs
Cloud computing/virtualization	⇔	Cloud computing/virtualization
Third-party/vendor management	↑	Bridging IT and the business
Project management and change management	⇔	Project management and change management
Data management and governance	↑	Third-party/vendor management

[2] *2017 Vendor Risk Management Benchmark Survey*, The Shared Assessments Program and Protiviti, www.protiviti.com/vendor-risk.



Privacy, Data and Security Are Shaping IT Audit Plans

Management and protection of organizational data, together with the enduring risk of cyber security threats, are among the most pressing concerns for executive teams and boards of directors around the world.[3] These issues are being compounded by emerging challenges presented by digital transformation and other innovations organizations are pursuing. Our results suggest that a significant number of boards have a high level of engagement in the organization's information security risks. Yet, many directors and executives with corporate governance responsibilities are growing *less*, rather than more, confident in their organization's ability to protect important data.[4] Given these concerns, many IT audit functions continue to prioritize security and privacy, both of which appear to be having significant impacts on their IT audit plans.

Throughout most enterprises, there is a growing awareness that more value, as well as increasing risk, resides in the vast and growing supply of organizational data as digital transformation efforts gain momentum. Global regulators are also aware of this dynamic, and they are responding by establishing new compliance requirements for privacy and information security, including but not limited to the EU's General Data Protection Regulation (GDPR), which is effective in spring 2018.[5] More IT audit leaders recognize that effective management and protection of organizational data requires knowing what data the organization possesses, where it resides, and the importance that should be ascribed to governing and protecting various data sets based on their value to the organization.

[3] *Executive Perspectives on Top Risks for 2018.*

[4] "Boards Seek Bigger Role in Thwarting Hackers," *The Wall Street Journal*, Jan. 10, 2018, www.wsj.com/articles/boards-seek-bigger-role-in-thwarting-hackers-1515596400.

[5] *General Data Protection Regulation (GDPR)*, www.protiviti.com/US-en/general-data-protection-regulation-gdpr.

Our results show that strong majorities of IT auditors view cyber security and privacy, IT governance and risk management, and emerging technology and infrastructure changes (e.g., transformation, innovation, disruption) to be affecting their current audit plans. Not surprisingly, most audit plans for the coming year include cyber security–related areas, as well as areas tied to the technology challenges detailed earlier.

However, more progress is needed. A significant number of organizations are not addressing cyber security in any way in their audit plans. Given the enterprisewide threats that cyber security gaps pose to organizations today, every audit plan in every company should include cyber security in some fashion. Resource constraints (people, skills and/or auditing tools) represents the most commonly cited reason why audit plans fail to address cyber security. Such shortcomings need to be addressed with urgency.

• • • Which of the following top technology challenges impact your 2018 audit plan?

Company Size (Annual Revenue)

	Greater than US$5 billion	US$1 billion – US$4.99 billion	US$100 million – US$999.99 million	Less than US$100 million
IT security and privacy/cyber security	81%	82%	80%	75%
IT governance and risk management	67%	75%	67%	64%
Regulatory compliance	63%	66%	63%	63%
Emerging technology and infrastructure changes — transformation, innovation, disruption	67%	66%	60%	60%
Cloud computing/virtualization	65%	55%	48%	57%
Project management and change management	47%	52%	50%	57%
Third-party/vendor management	59%	45%	49%	47%
Infrastructure management	55%	48%	49%	44%
Resource/staffing/skills challenges	49%	51%	47%	49%
Bridging IT and the business	48%	44%	48%	41%
Big data and analytics	51%	43%	37%	49%
Budgets and controlling costs	40%	46%	43%	41%
Lack of successful ERP implementations and knowledge	23%	30%	24%	34%

• • • Which of the following top technology challenges impact your 2018 audit plan?

Region

	Africa	Asia	Europe	Latin America/ South America	Middle East	North America	Oceania
IT security and privacy/cyber security	71%	82%	84%	82%	64%	79%	96%
IT governance and risk management	65%	75%	68%	76%	68%	67%	72%
Regulatory compliance	68%	65%	65%	74%	45%	63%	60%
Emerging technology and infrastructure changes — transformation, innovation, disruption	74%	60%	59%	61%	55%	66%	76%
Cloud computing/virtualization	56%	55%	59%	45%	45%	56%	84%
Project management and change management	68%	53%	46%	53%	55%	50%	64%
Third-party/vendor management	44%	62%	47%	45%	32%	51%	76%
Infrastructure management	44%	51%	49%	63%	50%	49%	52%
Resource/staffing/skills challenges	65%	51%	39%	45%	27%	51%	80%
Bridging IT and the business	62%	51%	45%	39%	64%	43%	52%
Big data and analytics	50%	51%	45%	53%	45%	42%	56%
Budgets and controlling costs	65%	38%	36%	42%	59%	41%	52%
Lack of successful ERP implementations and knowledge	44%	38%	22%	29%	36%	26%	24%

Across region and organization size, cyber security and privacy are impacting audit plans.

• • • How engaged is your board of directors with information security risks relating to your business?

Company Size (Annual Revenue)

	Greater than US$5 billion	US$1 billion – US$4.99 billion	US$100 million – US$999.99 million	Less than US$100 million
High engagement and level of understanding by the board	45%	28%	29%	32%
Medium engagement and level of understanding by the board	35%	49%	44%	35%
Low engagement and level of understanding by the board	15%	15%	23%	24%
Don't know	6%	8%	4%	9%

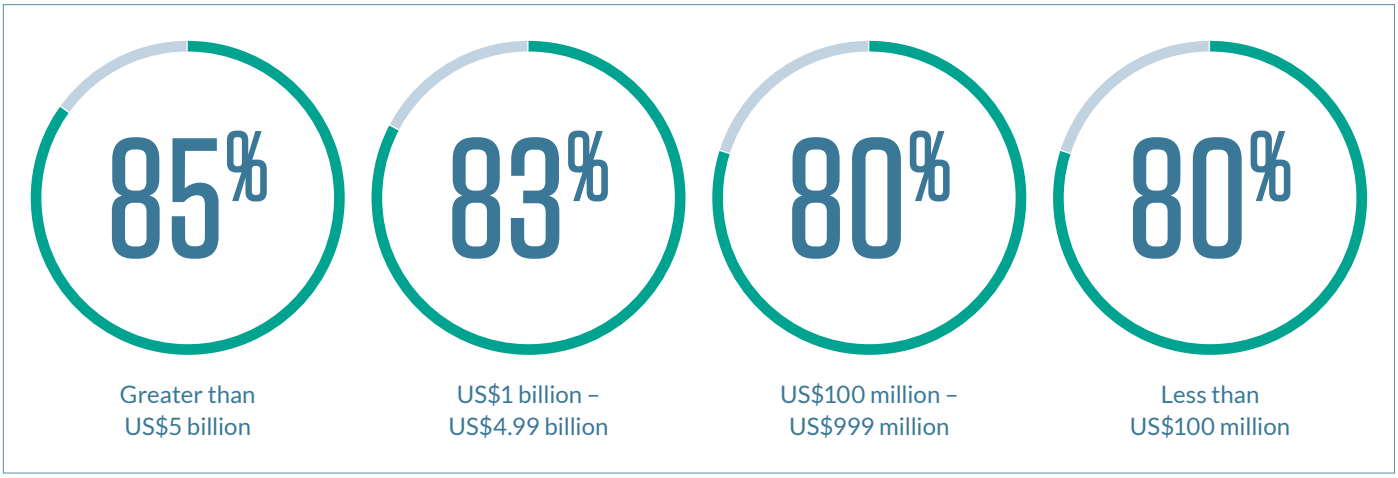
Region

	Africa	Asia	Europe	Latin America/ South America	Middle East	North America	Oceania
High engagement and level of understanding by the board	26%	26%	34%	22%	29%	38%	36%
Medium engagement and level of understanding by the board	47%	43%	41%	43%	38%	41%	28%
Low engagement and level of understanding by the board	27%	25%	20%	30%	14%	15%	28%
Don't know	0%	6%	5%	5%	19%	6%	8%

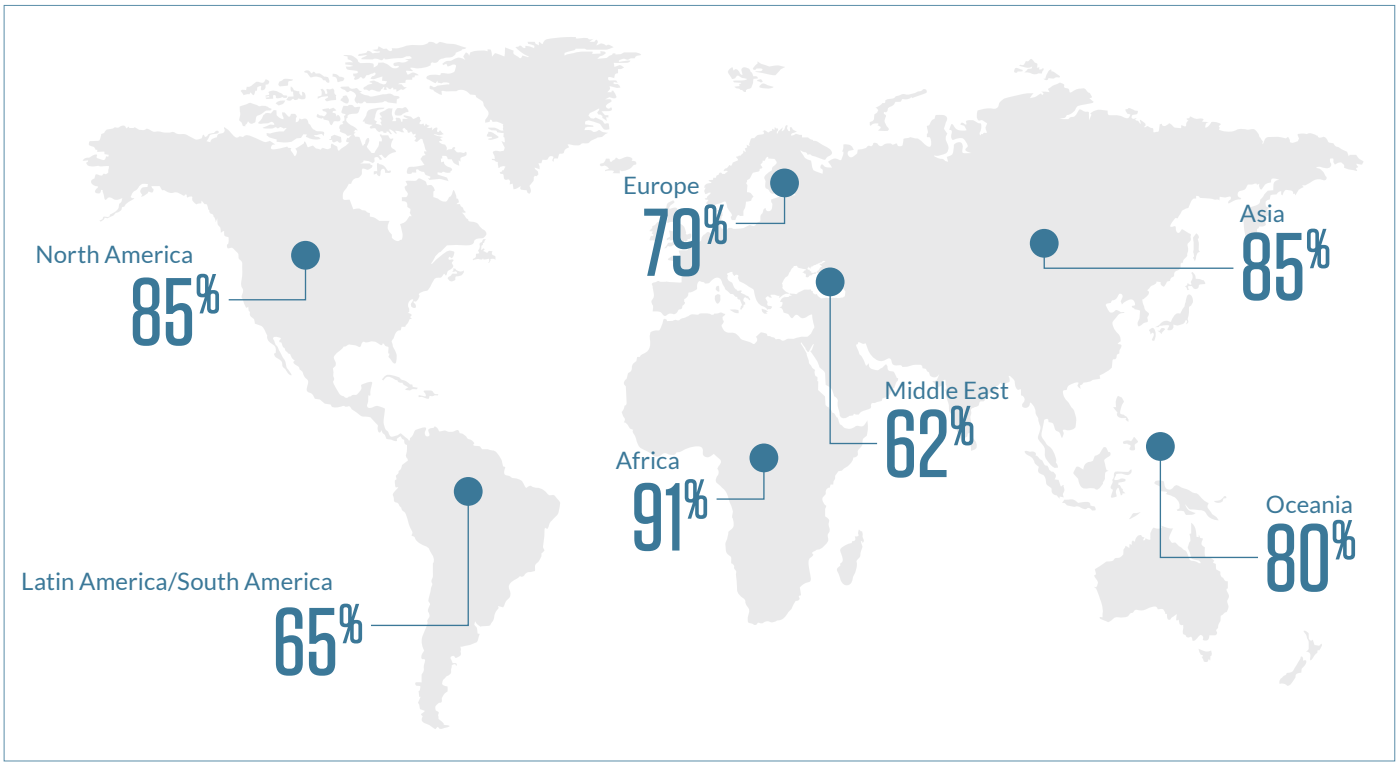
Boards show a significant level of engagement in and understanding of the organization's information security risks.

- - - **Has recent press coverage on cyber warfare and/or cyber security affected your interest in, and focus on, the subject of information security? (Shown: "Yes" responses)**

Company Size (Annual Revenue)



Region

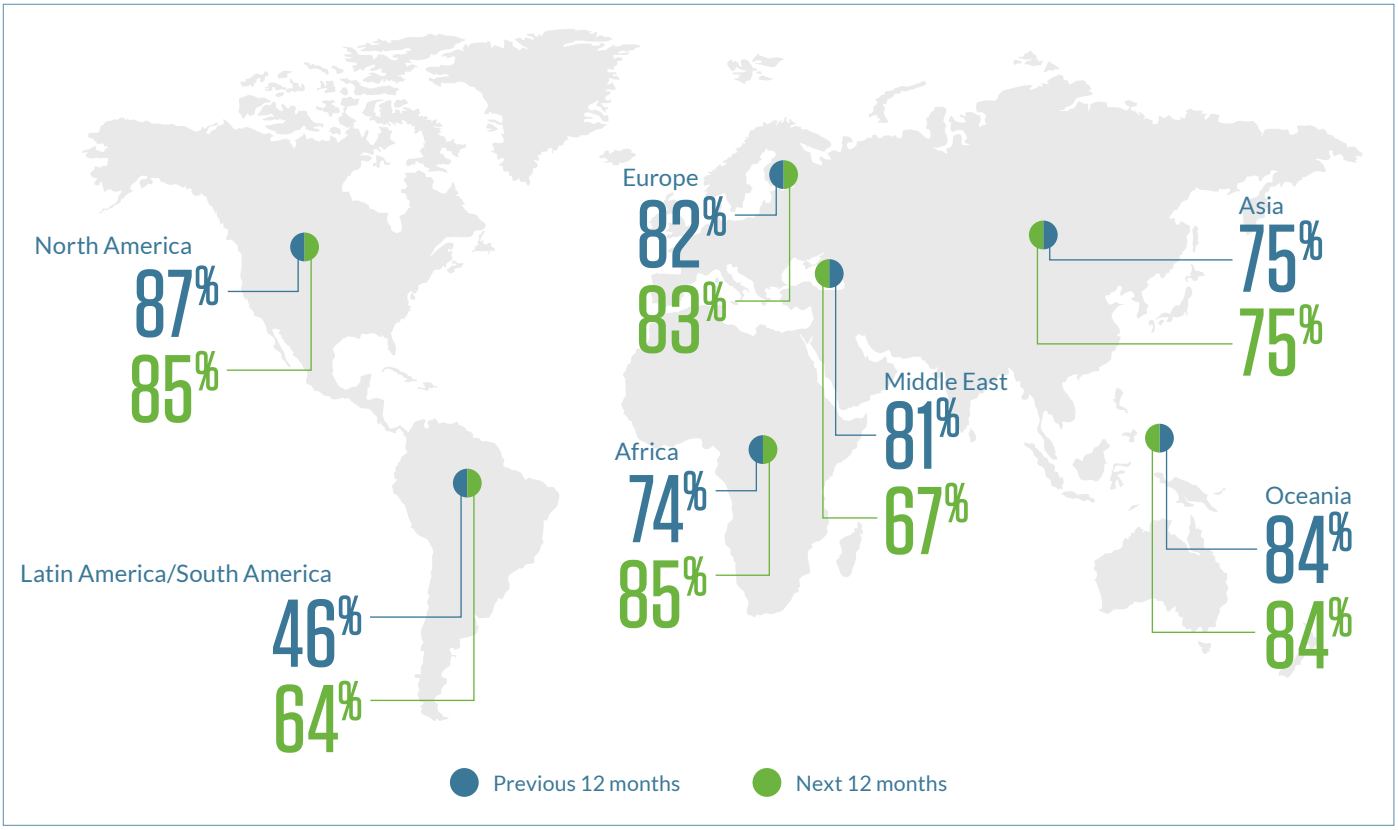


• • • Cyber security included in the audit plan (Shown: "Yes" responses):

Company Size (Annual Revenue)

	Greater than US$5 billion	US$1 billion – US$4.99 billion	US$100 million – US$999.99 million	Less than US$100 million
Previous 12 months	89%	87%	76%	69%
Next 12 months	89%	81%	78%	78%

Region



Cyber security continues to garner a high level of attention and interest, yet a number of organizations still do not include it in the audit plan.

Which of the following frameworks does the audit function use in performing assessments of the organization's cyber security posture/maturity? (Multiple responses permitted)

NIST Cybersecurity Framework	59%
COBIT	53%
ISO 27000	44%
NIST 800-53	24%
CIS Top 20	14%
FFIEC Cybersecurity Assessment Tool	13%
AICPA Trust Service Criteria	5%

What cyber-related audit activities have been performed? (Multiple responses permitted)

Security program assessment/framework gap analysis	70%
Privileged access management	65%
Technical assessments (vulnerability assessment, penetration testing, "red team")	53%
Security incident response — simulation/tabletop	46%
Data loss prevention (identification of "crown jewels")	43%
Social engineering	26%
Cyber breach kill chain	10%

KEY FACT

Among organizations that are not addressing cyber security as part of audit activities, the percentage of those that cite a lack of qualified/available resources (people or tools) as the primary reason

• • • How are cyber security audits typically resourced? (Multiple responses permitted)

Company Size (Annual Revenue)

	Greater than US$5 billion	US$1 billion – US$4.99 billion	US$100 million – US$999.99 million	Less than US$100 million
Exclusively with in-house (IT audit) resources	50%	38%	33%	41%
Co-sourced using external subject-matter experts	37%	30%	32%	29%
In-house resources with support from technical IT/information security resources	38%	33%	26%	29%
Outsourced	8%	19%	24%	22%

Region

	Africa	Asia	Europe	Latin America/ South America	Middle East	North America	Oceania
Exclusively with in-house (IT audit) resources	35%	45%	43%	53%	33%	40%	28%
Co-sourced using external subject-matter experts	29%	25%	33%	19%	14%	36%	40%
In-house resources with support from technical IT/information security resources	24%	34%	35%	17%	48%	33%	20%
Outsourced	26%	17%	14%	11%	10%	17%	36%

Significant numbers of organizations are co-sourcing cyber security audits with external subject-matter experts used to provide technical and comparative insights.

IT Audit Needs to Become More Engaged With Technology Projects

Given the increasing volume of technology system and application implementations, as well as their evolving nature, IT auditors should become involved with these projects earlier, more often and in a more integrated fashion. However, this year's results point to a slight decline in IT audit's involvement in technology projects compared to last year's survey results. These findings are surprising given the high levels of change underway in many organizations.

One key to strengthening IT auditors' involvement in technology projects hinges in great part on human factors, such as the function's reputation with IT and business partners, its ability to articulate clearly the value it provides on these projects, and the quality of its partnerships throughout the organization.

IT audit functions can fulfill a valuable role throughout the entire technology project lifecycle, beginning with project concept and business case development, into planning and design phases, development and testing, and continuing throughout the implementation and post-implementation phases. As part of this work, IT auditors can evaluate numerous components and dimensions of the technology project, not only in areas where IT audit has traditionally focused (e.g., project governance, development and testing, data conversion, documentation and training), but also in areas that are not always a focus but often lead to issues in project delivery (e.g., strategic and process alignment, corporate culture, stakeholder engagement, human capital, and organizational change readiness). IT audit functions that are involved early and throughout the technology implementation lifecycle can help to ensure project risks are more likely to be identified, escalated, evaluated and acted upon as close to real-time as possible, enabling projects to stay on track. However, despite the value that IT audit's contributions can deliver, our results indicate that this type of comprehensive IT audit involvement in technology implementations remains the exception rather than the rule.

The importance of risk advisory and independent monitoring and testing during major technology and digitalization projects has further increased as more of these initiatives are conducted outside of the IT department/organization. These include, but are not limited to, "shadow IT" projects as well as sanctioned projects by newly formed functions outside of IT (for example, finance and marketing). There also is the increased use within the IT function of Agile development methodologies. These developments can give rise to new risks, including those related to project updates (in response to changing business requirements), governance shortcomings, the absence of a defined project management methodology, and ill-defined goals, among many others. Such shortcomings routinely thrust technology and digitalization projects over budget and extend their planned timelines, which spark other costly business disruptions. They also imperil the achievement of long-term objectives for these projects. Of note, many organizations do not have a formal process in place to determine whether to continue or postpone an IT implementation project if new risks arise during the implementation.

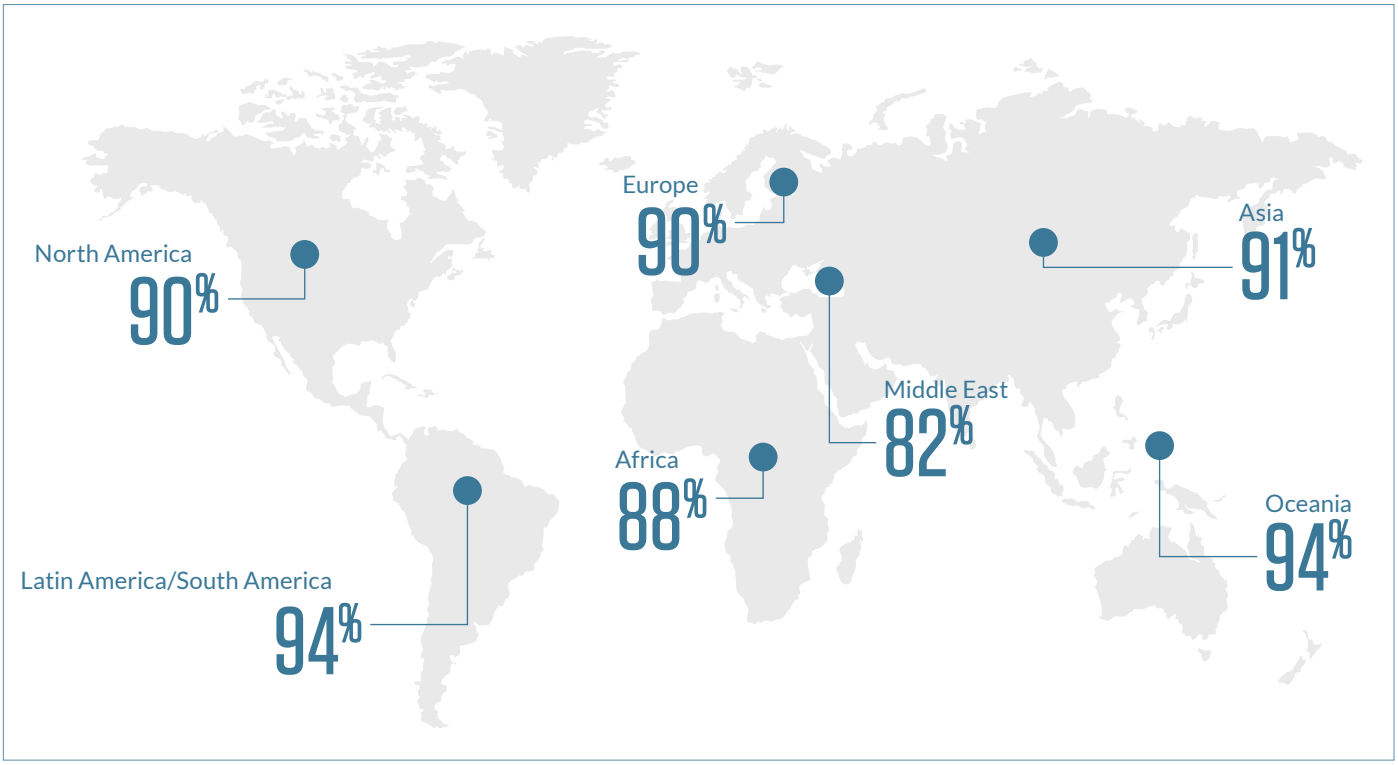
IT audit functions can fulfill a valuable role throughout the entire technology project lifecycle, beginning with project concept and business case development, into planning and design phases, development and testing, and continuing throughout the implementation and post-implementation phases.

When it comes to becoming more engaged in the organization's major technology projects, IT audit leaders face an important challenge. First, they should focus on building strong relationships with those leaders and subject-matter experts in the organization who can provide valuable top-down direction to others that IT audit should be engaged in such key technology projects. IT audit's role also hinges on their reputation in the organization. They must be able to add value and insight through their engagement, particularly as project environments are often high-stress. They need to build reputations as capable risk advisers who help ensure that guardrails are in place to assure technology projects are managed in a risk-savvy manner, without unduly impeding progress and innovation. This is especially vital as organizations increasingly transition to an Agile environment, necessitating that IT auditors learn how to engage and audit Agile projects. That process occurs through effective partnering and collaboration with the IT function, IT compliance teams and line-of-business leaders. Building strong relationships with executive management and the audit committee also helps spread the word about the IT audit function's capabilities and the benefits of involving IT audit early in the technology implementation lifecycle.

• • • Has your company implemented an IT system or application in the last three years?

	Current	2016
Yes	90%	88%
No	7%	8%
Unsure	3%	4%

Region ("Yes" responses)



Most organizations have implemented an IT system or application in the last three years.

What was the primary purpose of the IT implementation project?*

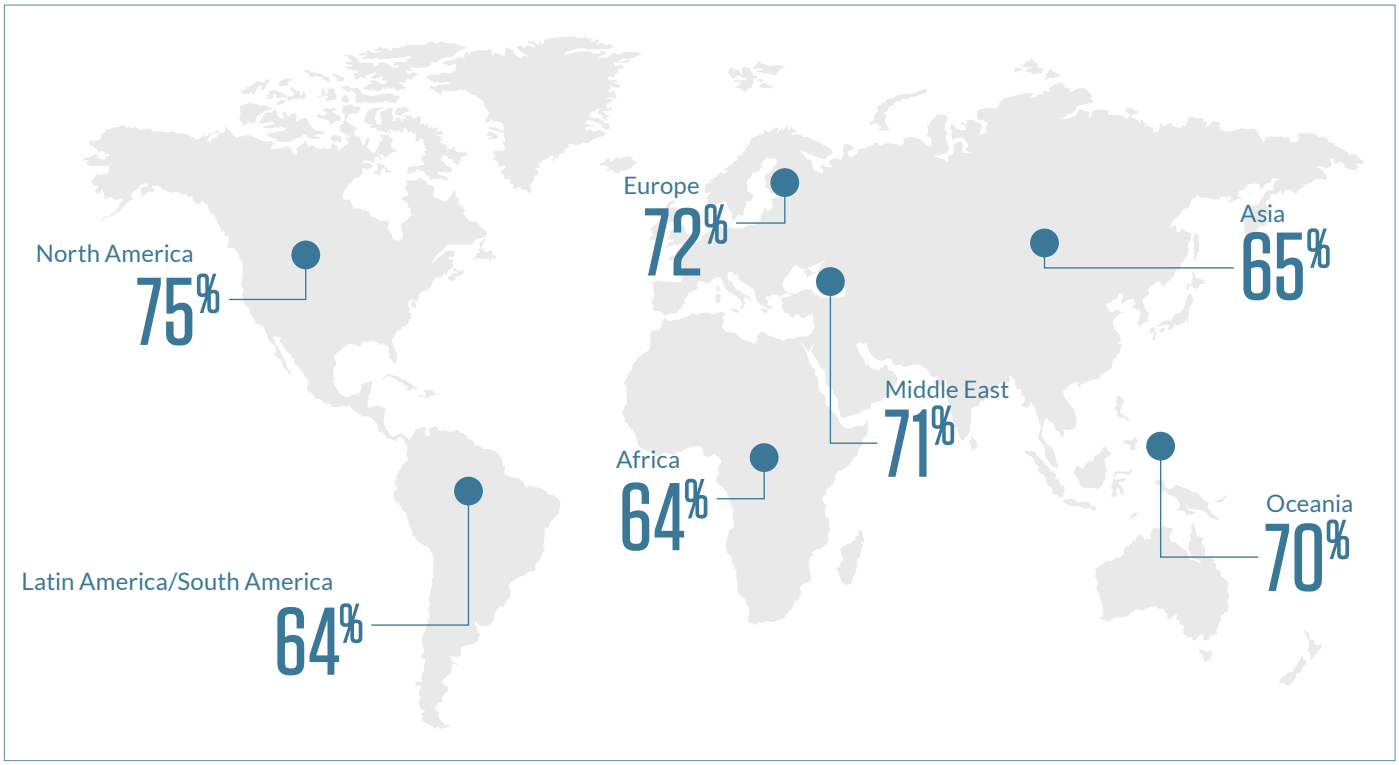
Region

	Africa	Asia	Europe	Latin America/ South America	Middle East	North America	Oceania
Process automation	44%	40%	35%	41%	50%	30%	30%
Core/foundational infrastructure improvement	33%	34%	25%	27%	21%	32%	23%
Customer interface: ease of use	6%	15%	9%	14%	11%	11%	17%
Business intelligence	6%	6%	10%	14%	11%	9%	7%
Collaboration	0%	0%	3%	0%	0%	4%	10%
Customer interface: personalization	0%	0%	2%	0%	0%	3%	10%

* Not shown: Percentage of "Other" responses.

From the perspective of the board of directors or senior management, was the IT implementation project successful in advancing organizational objectives?

Region ("Yes" responses)

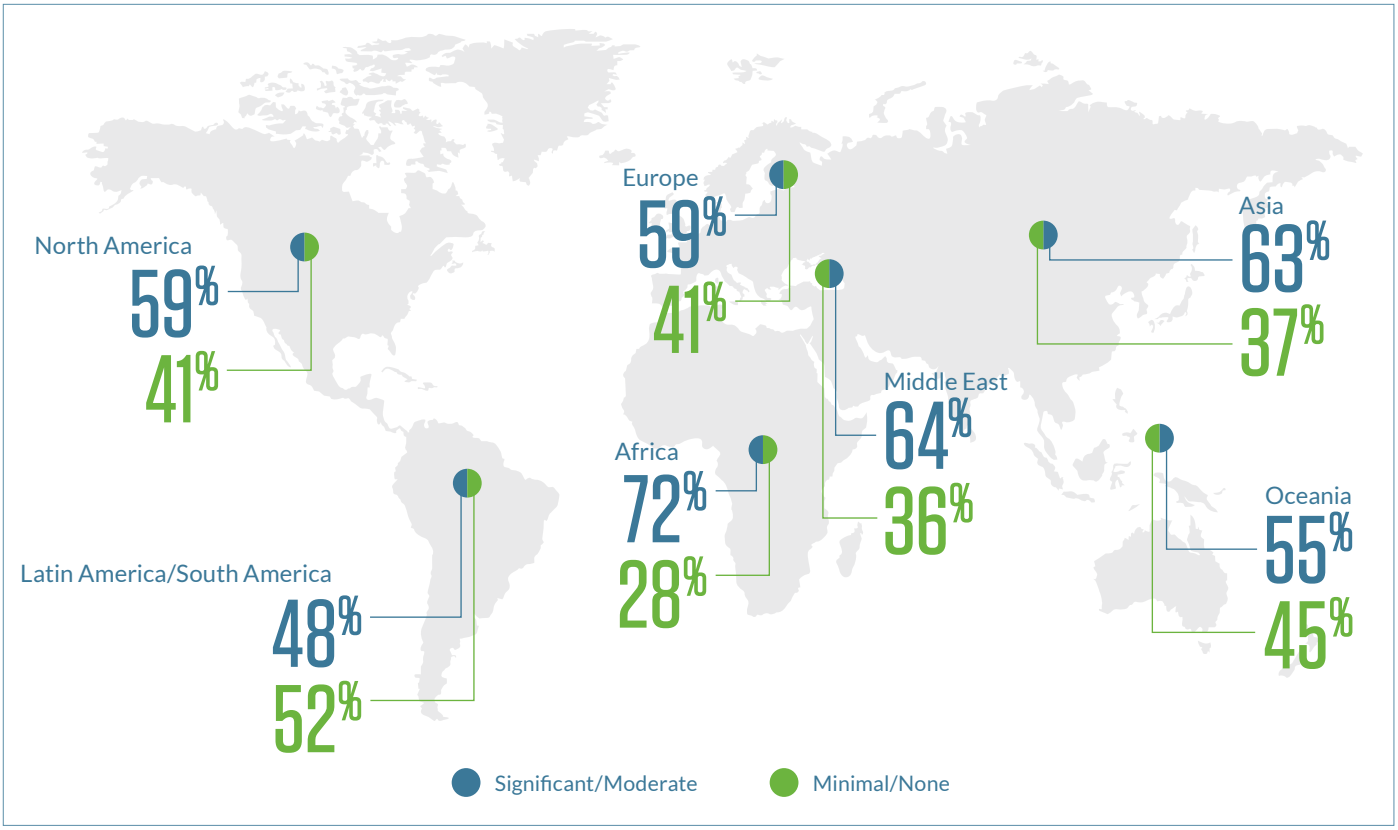


• • • What level of involvement does IT audit have in significant technology projects?

Company Size (Annual Revenue)

	Greater than US$5 billion	US$1 billion – US$4.99 billion	US$100 million – US$999.99 million	Less than US$100 million
Significant	16%	20%	20%	21%
Moderate	45%	35%	41%	40%
Minimal	33%	42%	26%	26%
None	6%	3%	13%	13%

Region



When does IT audit become involved in significant technology projects? (Multiple responses permitted)

	Current	2016
Planning	41%	43%
Design	37%	35%
Testing	38%	38%
Implementation	40%	37%
Post-implementation	68%	65%
No involvement	10%	12%

Region

	Africa	Asia	Europe	Latin America/ South America	Middle East	North America	Oceania
Planning	44%	33%	32%	30%	40%	46%	48%
Design	31%	37%	38%	27%	20%	39%	34%
Testing	61%	46%	30%	30%	20%	41%	38%
Implementation	50%	49%	31%	41%	32%	42%	45%
Post-implementation	69%	70%	69%	73%	64%	66%	79%
No involvement	11%	9%	12%	14%	16%	9%	3%

GLOBAL LEADER
Africa

72% of IT audit functions have a significant or moderate level of involvement in major technology projects.

Internal audit gets involved in all major projects. We attend project steering committees, IT governance committees and IT strategy committees. [We also] integrate key IT processes in our business process reviews, such as application security and user access rights.

— Chief audit executive, small financial services company, Oceania

For IT implementation projects that occurred in the last three years, which of the following did IT audit evaluate? (Multiple responses permitted)

Project governance	52%
Test phases	50%
Post-implementation project review	50%
Data conversion process	50%
System development lifecycle (SDLC)	49%
Project risk management plan	48%
Documentation and training	46%
Interfaces	44%
Project plan	44%
Alignment of project success measures to desired business outcomes	43%
Project requirements	41%
Communication plan — project plan	32%
Reporting integrity	28%
Communication plan — stakeholders	27%
Project budget	27%
Define project success measures	26%
Organizational readiness	26%
Stakeholder identification	21%

It is interesting to find that "organizational readiness" is evaluated infrequently by IT auditors. This represents a key reason why projects do not deliver their intended results. Whether organizational readiness is addressed by IT audit or other auditors, it should be evaluated.

For IT implementation projects that occurred in the last three years, which of the following did IT audit evaluate? (Multiple responses permitted)

Region

	Africa	Asia	Europe	Latin America/ South America	Middle East	North America	Oceania
Project governance	43%	71%	45%	53%	50%	43%	60%
Test phases	48%	36%	45%	47%	56%	48%	36%
Post-implementation project review	52%	71%	59%	48%	67%	52%	40%
Data conversion process	39%	43%	50%	38%	56%	39%	32%
System development lifecycle (SDLC)	34%	46%	52%	43%	33%	34%	44%
Project risk management plan	45%	54%	43%	53%	61%	45%	48%
Documentation and training	45%	43%	45%	49%	61%	45%	36%
Interfaces	32%	21%	38%	37%	33%	32%	32%
Project plan	43%	46%	39%	42%	56%	43%	44%
Alignment of project success measures to desired business outcomes	45%	54%	50%	49%	47%	45%	48%
Project requirements	27%	39%	32%	40%	39%	27%	32%
Communication plan — project plan	25%	36%	36%	31%	36%	25%	40%
Reporting integrity	18%	29%	23%	22%	19%	18%	36%
Communication plan — stakeholders	16%	36%	23%	25%	31%	16%	36%
Project budget	41%	36%	30%	33%	39%	41%	24%
Define project success measures	30%	39%	20%	30%	39%	30%	24%
Organizational readiness	18%	32%	23%	26%	28%	18%	32%
Stakeholder identification	18%	29%	18%	19%	22%	18%	28%

What is the most significant risk factor for IT implementation projects within your organization?

Frequency of updates to project goals and outcomes based on changing business requirements	27%
Absence of a defined and documented project management methodology	11%
Goals and objectives are not clearly defined	10%
Lack of a formal project governance structure	10%
Frequency of change in project specifications without formal assessment	9%
Lack of stakeholder engagement	9%
Capabilities and skills of the project manager and/or broader project team	7%
Lack of a defined SDLC	4%
Level of employee turnover on project teams	3%
Other	10%

The most significant risk with IT implementation projects is the frequency of updates to project goals and outcomes based on changing business requirements. Auditors should be very focused on this as well as upfront activities related to requirements gathering and stakeholder engagement.

Business decisions made 5 to 10 years ago are impacting today's capability to address existing and future security threats.

— IT audit director, large healthcare provider organization, North America

• • • Is there a formal process to determine whether to continue or postpone the IT implementation project if new risks are identified while the implementation process is underway?

Company Size (Annual Revenue)

	Greater than US$5 billion	US$1 billion – US$4.99 billion	US$100 million – US$999.99 million	Less than US$100 million
Yes, a formal process exists to determine whether to continue or postpone the IT implementation project	56%	51%	46%	39%
No, a formal process does not exist to determine whether to continue or postpone the IT implementation project	29%	36%	42%	52%
Unsure	15%	13%	12%	9%

Many organizations lack a formal process to determine whether to continue or postpone IT implementation projects if new risks are identified midstream. Larger companies are more likely than smaller organizations to have such a process in place, often because the business case evaluation processes (initial and ongoing) are much more mature and they have a greater willingness to stop a project if new risks are identified.

Legacy systems are continuing to become burdensome to support. Solutions aren't obvious and departments want results without helping the replacement along.

— Chief audit executive, large government organization, North America

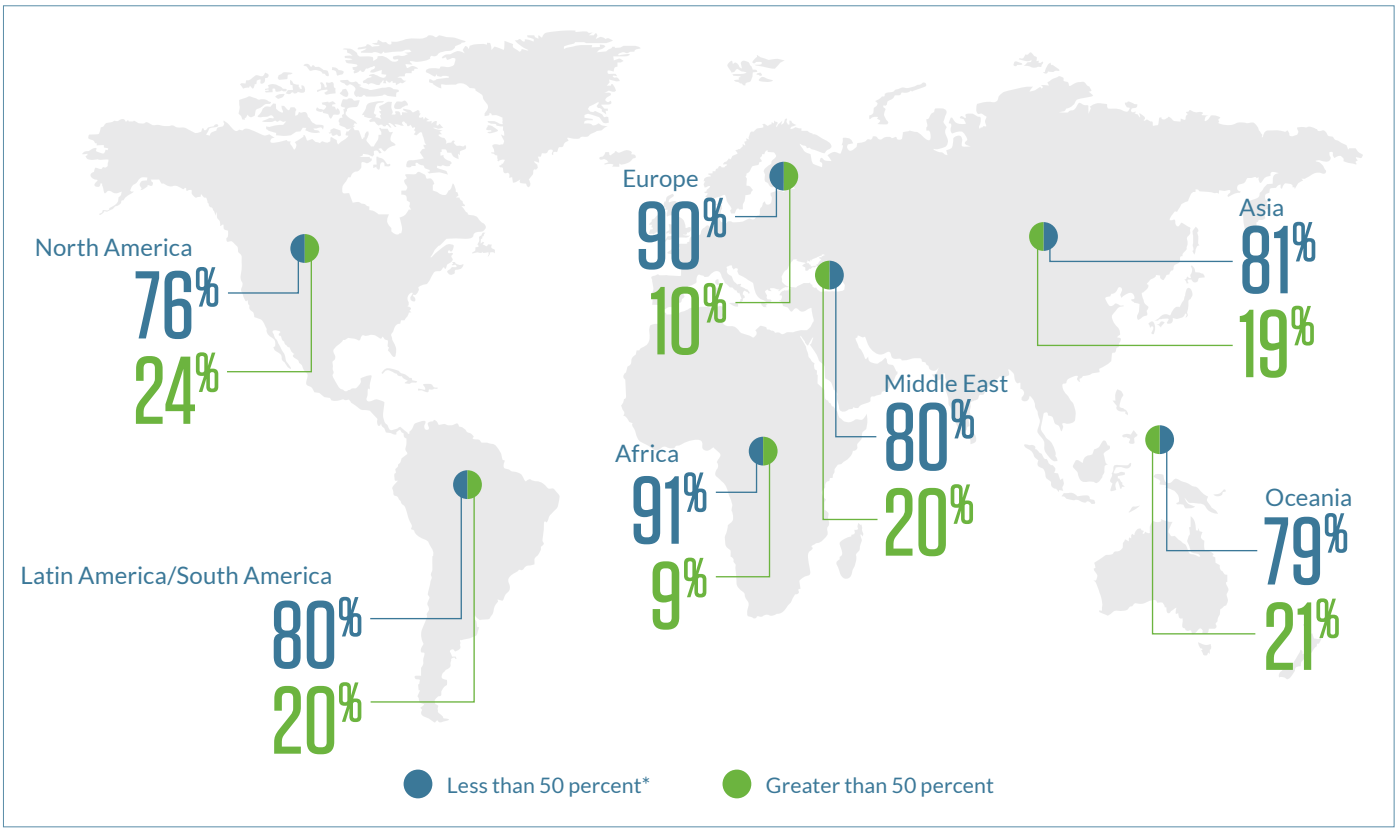
• • • What portion of IT audit's role in the IT implementation project involves a partnership with the IT department?

Company Size (Annual Revenue)

	Greater than US$5 billion	US$1 billion – US$4.99 billion	US$100 million – US$999.99 million	Less than US$100 million
Less than 50 percent*	80%	79%	83%	81%
Greater than 50 percent	20%	21%	17%	19%

* Includes "Don't know" responses

Region



* Includes "Don't know" responses

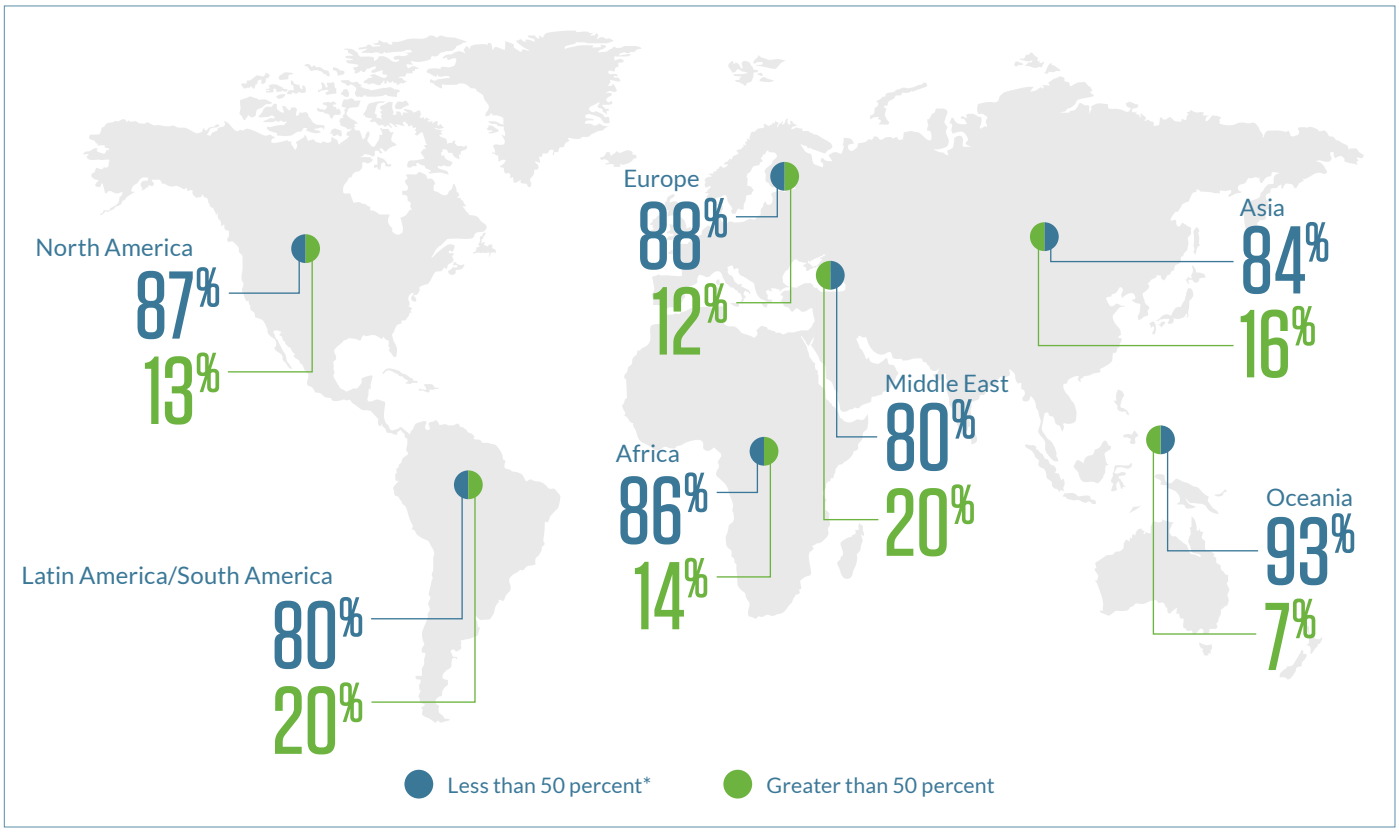
• • • What portion of IT audit's role in the IT implementation project involves a partnership with the IT compliance function?

Company Size (Annual Revenue)

	Greater than US$5 billion	US$1 billion – US$4.99 billion	US$100 million – US$999.99 million	Less than US$100 million
Less than 50 percent*	89%	86%	87%	81%
Greater than 50 percent	11%	14%	13%	19%

* Includes "Don't know" responses

Region



* Includes "Don't know" responses

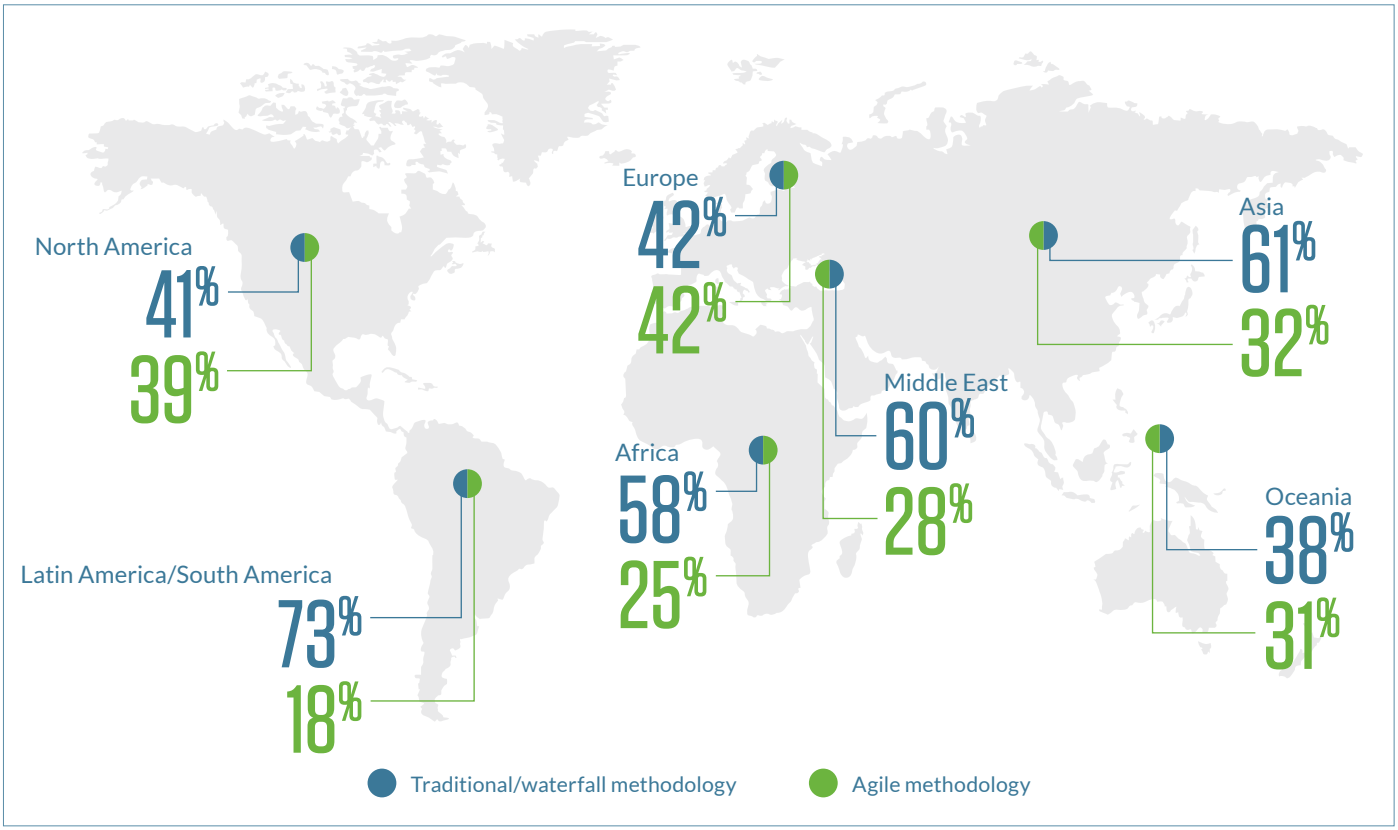
A majority of IT audit groups lack strong partnerships with the IT department or IT compliance function.

• • • Which of the following methodologies does your organization use for the IT project implementation?

Company Size (Annual Revenue)

	Greater than US$5 billion	US$1 billion – US$4.99 billion	US$100 million – US$999.99 million	Less than US$100 million
Traditional/waterfall methodology	30%	47%	54%	61%
Agile methodology	46%	38%	32%	25%
Other	24%	15%	14%	14%

*Region**



* Not shown: "Other" responses

Profiling IT Audit's Growing Role

IT audit's role, and importance, within the internal audit department and the organization is increasing, according to several measures. This is encouraging news. Yet a difficult question persists: *Is IT audit moving as fast as reasonably possible to evolve skills, leverage new tools and develop deeper stakeholder relationships, given the organization's rapidly growing reliance on technology and data and the risks associated with ongoing technology and digital transformation?* Although the answers vary across organization size, region and, naturally, individual companies, our findings suggest that more progress is needed, especially with regard to breaking down organizational silos and fortifying IT audit's relationships with stakeholders throughout the organization and on the board.

From a leadership perspective, the results are encouraging. This year marks the first time in our survey's history that at least half of all organizations have a designated IT audit director (or equivalent position). Just five years ago, only 33 percent of organizations had a designated IT audit director. In more than two-thirds of the companies with a dedicated IT audit director, the individual is a direct report of the chief audit executive (CAE). In addition, the percentage of IT audit reports relative to the total number of audit reports issued has increased substantially over the past several years and has reached a high point this year, indicating that the importance of having involved and capable IT auditors is increasing — no surprise given the broader technology (and related) trends discussed earlier.

Our research findings point to a valuable opportunity with regard to how the IT audit function is viewed by business partners and board members. For example, despite the aforementioned growth in IT audit's activities, fewer than half of IT audit directors regularly attend audit committee meetings. This figure remains surprisingly low in light of the audit committee's soaring interest in the state of the organization's cyber security, data governance capabilities and technology-involved business transformation. IT audit possesses valuable insights into these and other areas of risk, as well as the organization's progress in addressing them. Given the board's growing hunger for this type of information, more IT audit directors should strive to share their insights directly with audit committee members on a regular basis.

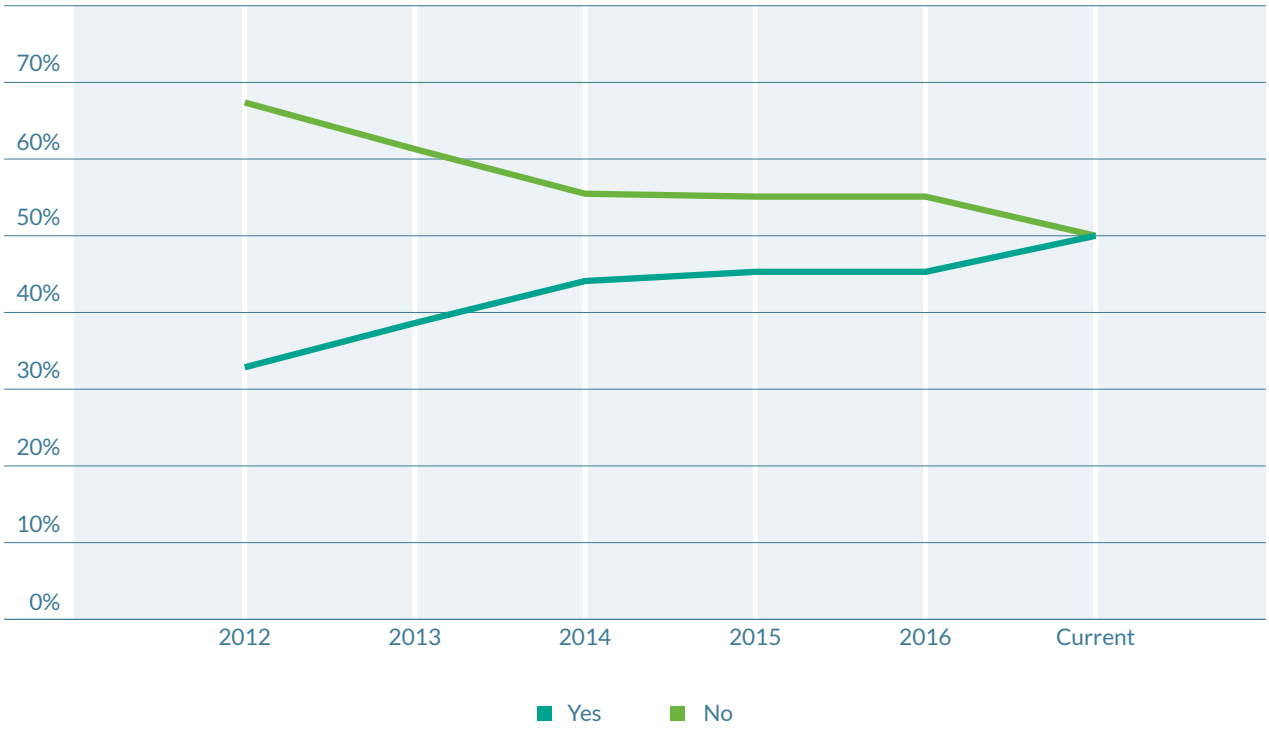
IT audit's work and relationship with its partners in the IT function is another significant opportunity for growth. This relationship is vital, yet only half of respondents indicate that their CAE or IT audit director regularly meets with the CIO while developing the audit plan. Even fewer CAEs and IT audit directors regularly attend meetings focused on large-scale IT-enabled projects, IT department staff topics or IT portfolio reviews. Nearly one in five respondents indicate that their CAE or IT audit leader does not regularly attend *any* of those meetings.

IT audit's role, and importance, within the internal audit department and the organization is increasing, according to several measures. This is encouraging news. Yet a difficult question persists: Is IT audit moving as fast as reasonably possible to evolve skills, leverage new tools and develop deeper stakeholder relationships, given the organization's rapidly growing reliance on technology and data and the risks associated with ongoing technology and digital transformation?

CAEs and IT audit leaders need to find ways to become regular participants in these meetings for two reasons. First, the growing adoption of Agile and DevOps methodologies (along with the increasing development and purchase of technology outside the IT function) means that the pace of technological change — and the nature of technology risks — is increasing. Regular interactions with IT leaders, as well as all parts of the organization where development and delivery of IT services occur, can help IT auditors maintain a current and accurate understanding of emerging technology risks and build these into the audit plan. Second, regular meetings with board members, IT leaders and other business leaders can help strengthen IT audit's reputation and more effectively convey throughout the organization the value it can deliver.

Finally, when it comes to resources, IT audit groups should evaluate whether they have the right skills to deliver against the evolving and increasingly technical IT risk landscape that most organizations face, either through enhancing their skills or internal resources, or augmenting their staffs with external expertise. A majority of organizations currently invest in some level of external IT audit expertise via outsourcing, co-sourcing and/or the use of guest auditors. Co-sourcing is the most frequently used form of accessing IT audit expertise outside of the IT audit function. The use of outside IT audit resources reflects an understanding of the IT audit group's expanding workload and a willingness to invest in the resources and expertise needed to conduct this work. In fact, given the widespread need for IT audit resources and the growing competition for this type of talent, it is surprising that 40 percent of responding organizations are not augmenting their IT audit staffs with any outside expertise.

• • • Do you have a designated IT audit director (or equivalent position)?



Half of all organizations now have a designated IT audit director. It is noteworthy that there has been a significant increase among large companies that have this position, likely reflecting a recognition among them that a designated IT audit director is needed more than ever.

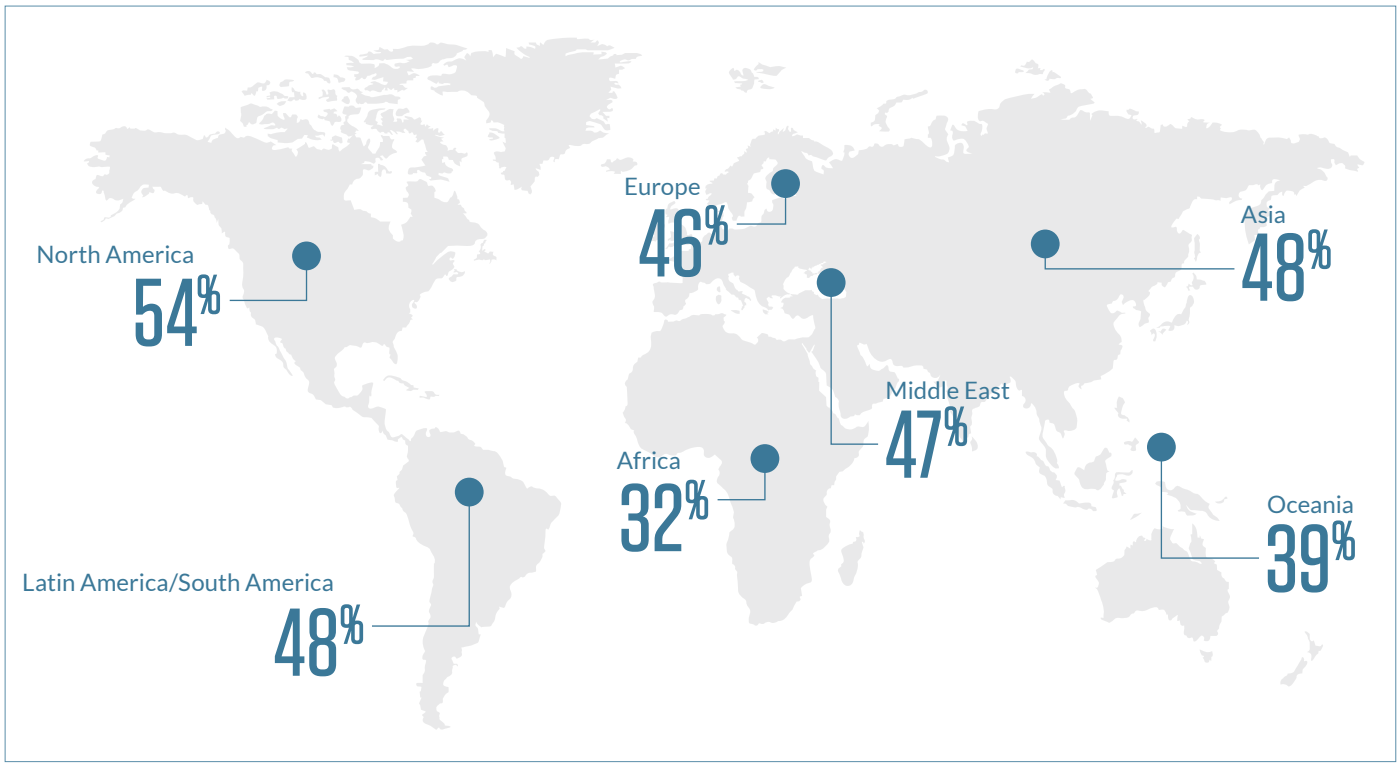
*Company Size (Annual Revenue)**

	Current	2016	2015	2014
Greater than US$5 billion	71%	59%	60%	59%
US$1 billion – US$4.99 billion	46%	44%	40%	37%
US$100 million – US$999.99 million	31%	36%	31%	39%
Less than US$100 million	45%	38%	41%	37%

* Shown: Percentage of "Yes" responses.

• • • Do you have a designated IT audit director (or equivalent position)?

Region ("Yes" responses)



GLOBAL LEADER
North America

54% of organizations have an IT audit director or equivalent position.

Data analytics is a challenge for our organization. Leveraging the data we consume to make timely and accurate business decisions is a must have.

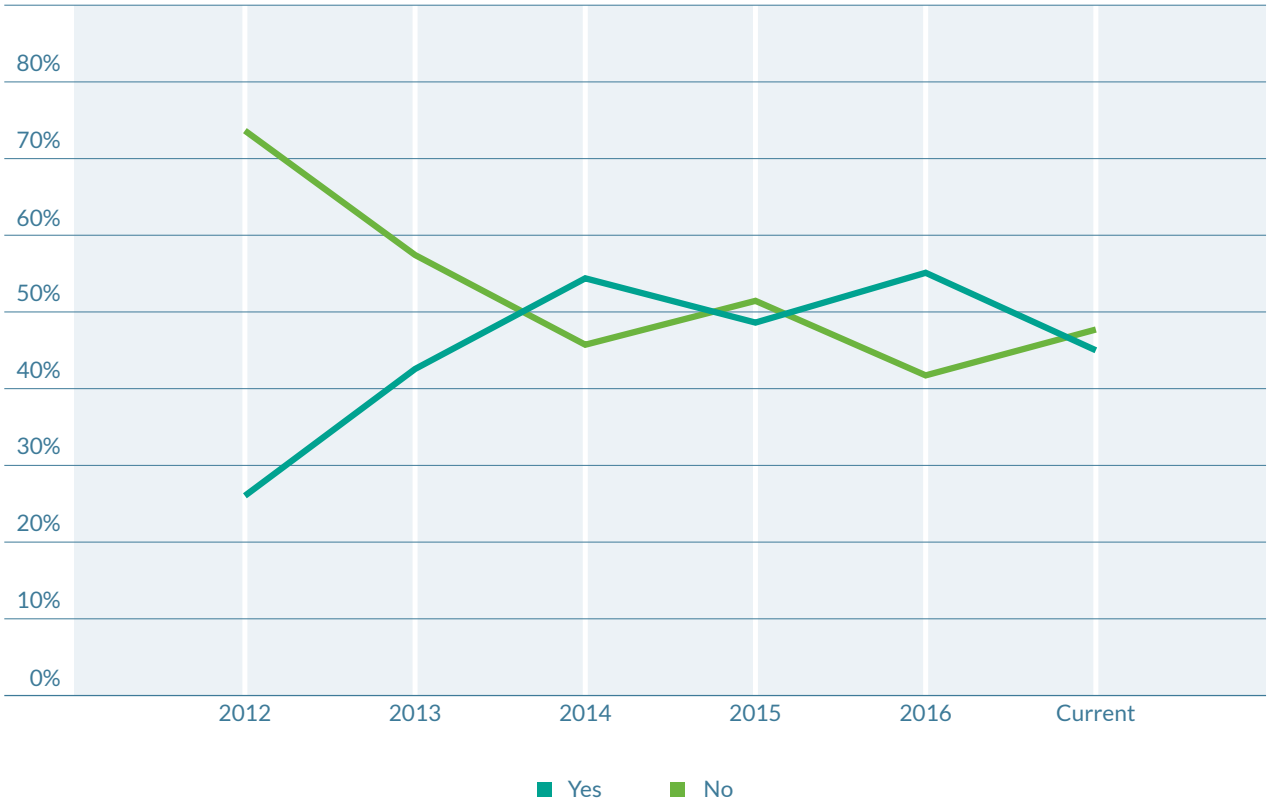
— IT audit director, large healthcare provider organization, North America

To whom within the organization does your IT audit director report?

Region

	Africa	Asia	Europe	Latin America/ South America	Middle East	North America	Oceania
Chief Audit Executive	69%	57%	65%	82%	43%	70%	83%
Chief Executive Officer	15%	30%	16%	5%	14%	8%	0%
Report through some other function	8%	10%	8%	5%	21%	12%	8%
A director under the CAE	8%	3%	6%	8%	7%	8%	0%
Chief Information Officer	0%	0%	5%	0%	15%	2%	9%

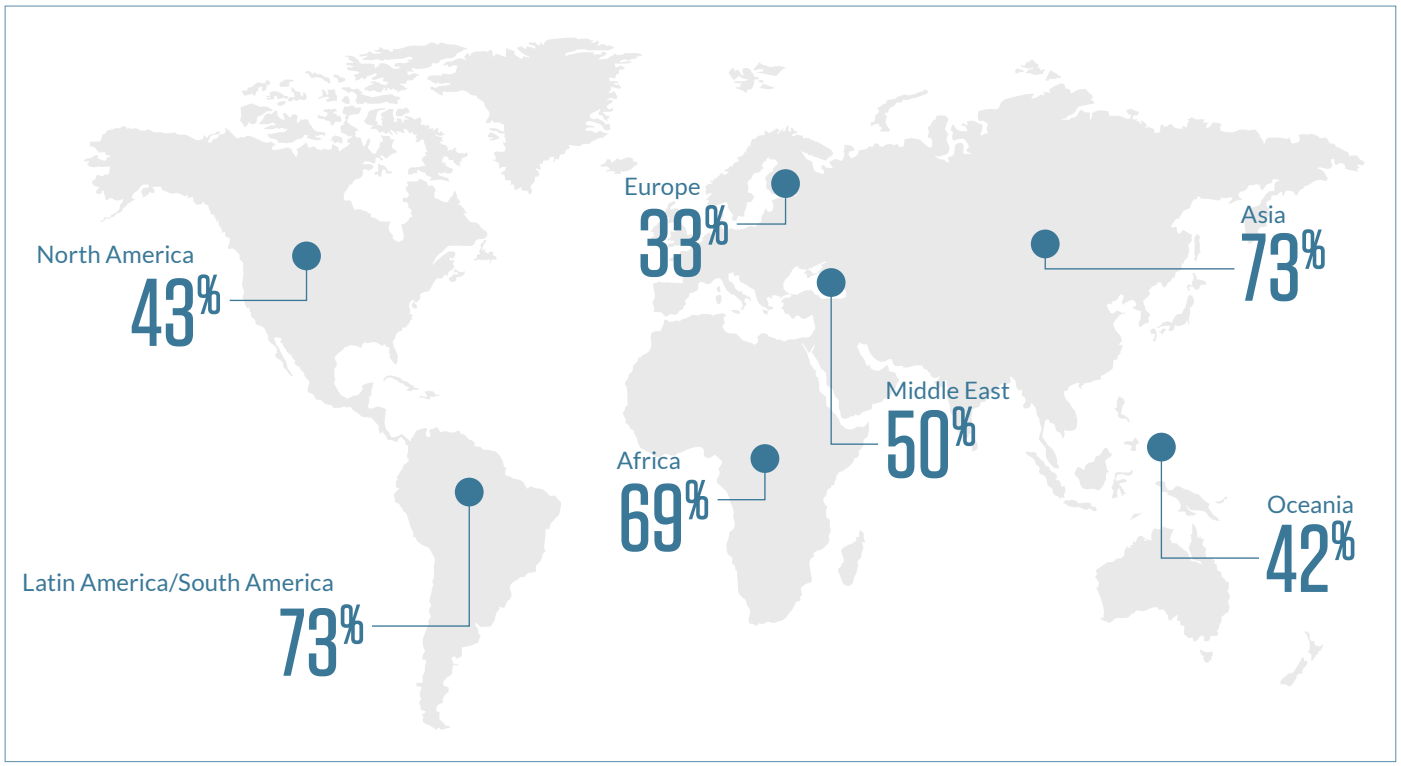
Does the IT audit director (or equivalent position) regularly attend the audit committee meetings?



In close to half of all organizations, the IT audit director regularly attends audit committee meetings, though the number has declined from the prior year.

• • • Does the IT audit director (or equivalent position) regularly attend the audit committee meetings?

Region ("Yes" responses)



GLOBAL LEADER
Asia and Latin/South America

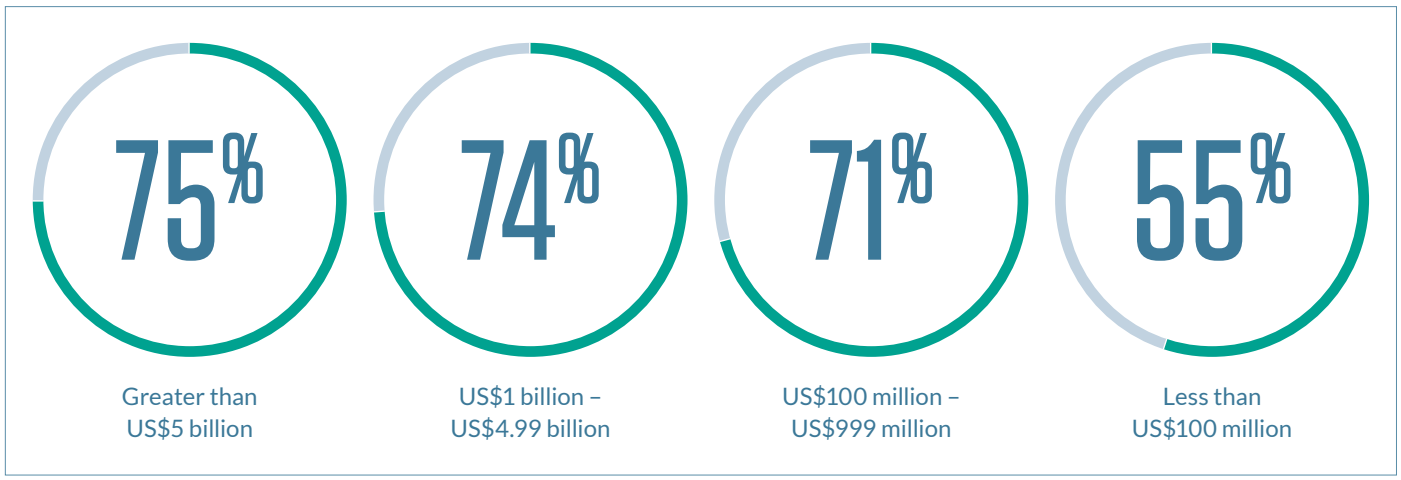
73% of IT audit directors regularly attend audit committee meetings.

The board has been supportive in ensuring IT audit has the appropriate resources and skills to adequately cover technology risk to the company. Training is a priority in our department to ensure our team's skills stay relevant. Staff development is critical as hiring and identifying external candidates to fill open roles has been challenging.

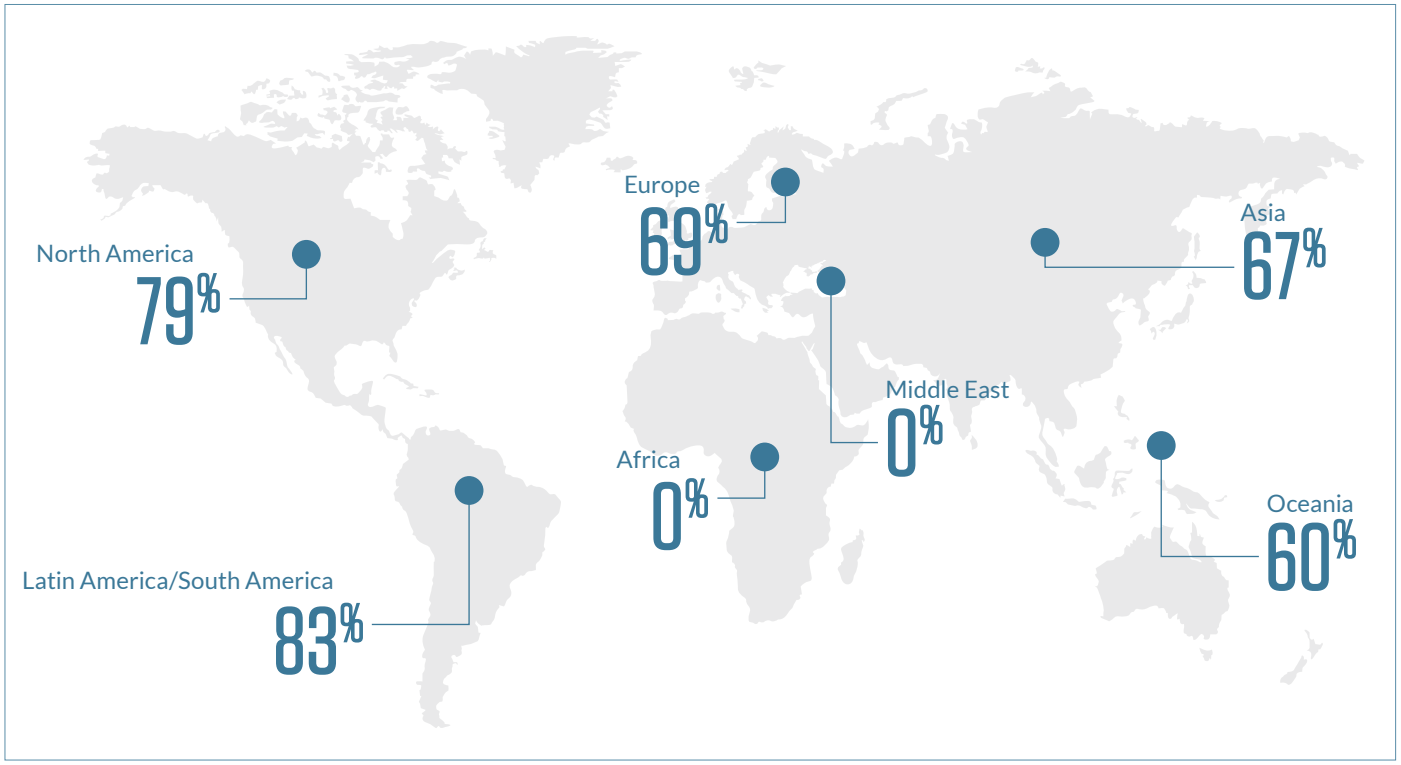
— IT audit director, large professional services firm, Europe

- - - **If "No": Does the CAE have sufficient knowledge to hold a discussion about IT audit matters with the audit committee? (Shown: "Yes" responses)**

Company Size (Annual Revenue)



Region



• • • Does the CAE or IT audit director attend any of the following meetings to help construct the IT audit plan? (Multiple responses permitted)

Region

	Africa	Asia	Europe	Latin America/ South America	Middle East	North America	Oceania
Regularly scheduled meetings with CIO	37%	33%	49%	46%	28%	56%	68%
Large-scale IT audit project meetings	32%	20%	27%	22%	24%	35%	45%
IT strategy meetings	24%	18%	26%	43%	34%	26%	26%
IT department staff meetings	7%	17%	18%	26%	21%	27%	23%
IT portfolio management meetings	10%	12%	16%	26%	14%	18%	19%

In most organizations, the CAE or IT audit leader is not attending IT meetings regularly to help develop the IT audit plan, conduct periodic checkpoints and stay abreast of IT-related happenings.

An IT audit risk assessment is completed annually or whenever major changes occur in the IT environment. Discussions are held with relevant management, e.g., head of IT and application owners, to ratify the results of the IT audit risk assessment. In addition, the outcome of the risk assessment is discussed with risk management to gather their feedback and comments.

— Chief audit executive, small financial services company, Oceania

• • • How are IT audit resources structured within your organization?

Company Size (Annual Revenue)

	Greater than US$5 billion			US$1 billion – US$4.99 billion			US$100 million – US$999.99 million			Less than US$100 million		
	Current	2016	2015	Current	2016	2015	Current	2016	2015	Current	2016	2015
Part of the internal audit department, not a separate function	49%	50%	56%	59%	61%	56%	58%	59%	63%	43%	46%	44%
Part of the internal audit department, but considered to be a separate function	41%	36%	35%	34%	26%	31%	28%	23%	22%	25%	22%	17%
Embedded in the organization as a separate audit function	9%	10%	7%	3%	8%	7%	6%	10%	9%	21%	21%	27%
No IT audit resources are available within the organization	1%	4%	2%	4%	5%	6%	8%	8%	6%	11%	11%	12%

Region

	Africa	Asia	Europe	Latin America/ South America	Middle East	North America	Oceania
Part of the internal audit department, not a separate function	32%	35%	52%	50%	37%	58%	55%
Part of the internal audit department, but considered to be a separate function	46%	40%	32%	35%	50%	29%	32%
Embedded in the organization as a separate audit function	12%	21%	13%	13%	10%	5%	10%
No IT audit resources are available within the organization	10%	4%	3%	2%	3%	8%	3%

• • • Do you use outside resources to augment/provide your IT audit skill set? (Multiple responses permitted)

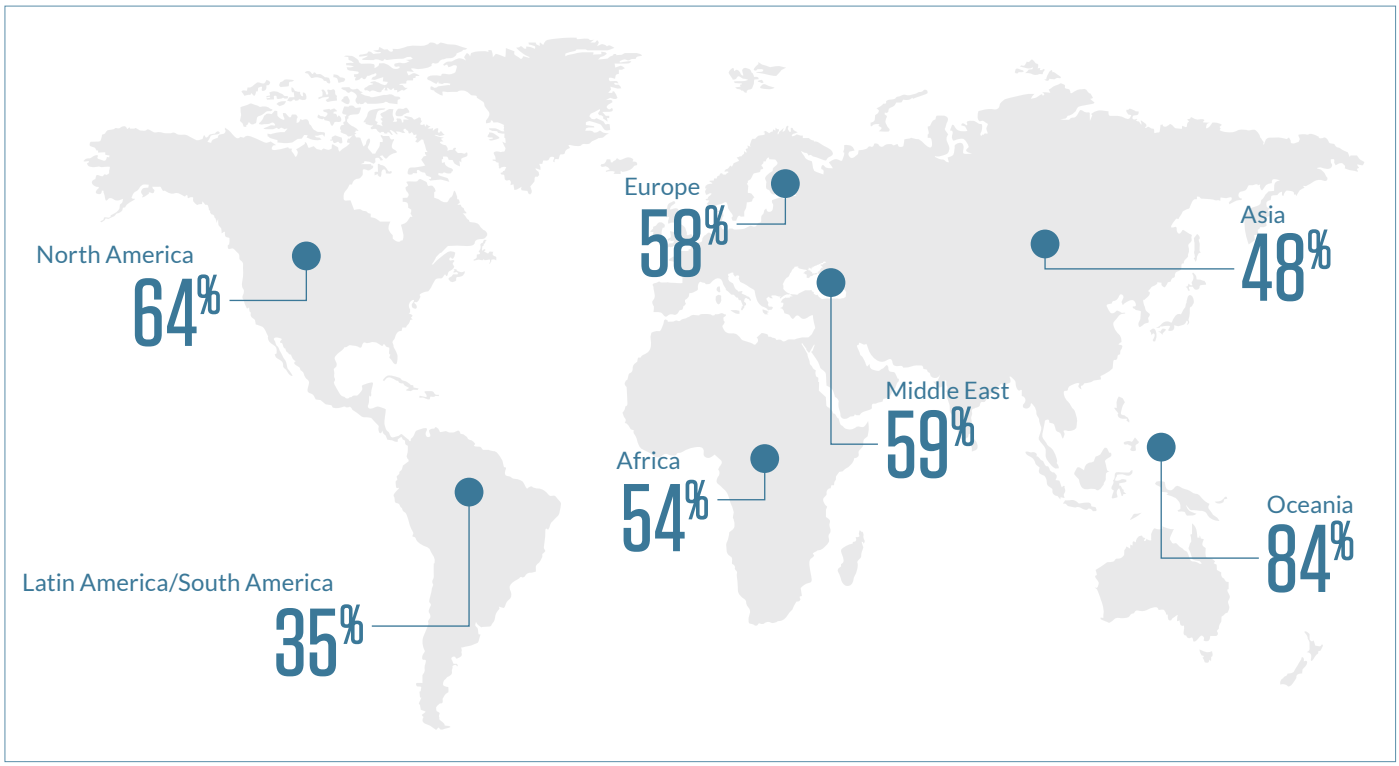
Company Size (Annual Revenue)

	Yes, we use guest auditors			Yes, we outsource the IT audit function			Yes, we use co-source providers			We do not use outside resources		
	Current	2016	2015	Current	2016	2015	Current	2016	2015	Current	2016	2015
Greater than US$5 billion	28%	22%	24%	5%	6%	5%	53%	36%	40%	31%	43%	41%
US$1 billion – US$4.99 billion	18%	15%	17%	5%	5%	9%	42%	46%	34%	42%	40%	48%
US$100 million – US$999.99 million	18%	24%	21%	6%	8%	10%	39%	30%	32%	44%	45%	47%
Less than US$100 million	22%	22%	28%	9%	8%	11%	30%	23%	20%	47%	51%	49%

A growing number of organizations are relying on outside resources (either outsourced or co-sourced) for assistance and support.

• • • Do you use outside resources to augment/provide your IT audit skill set?

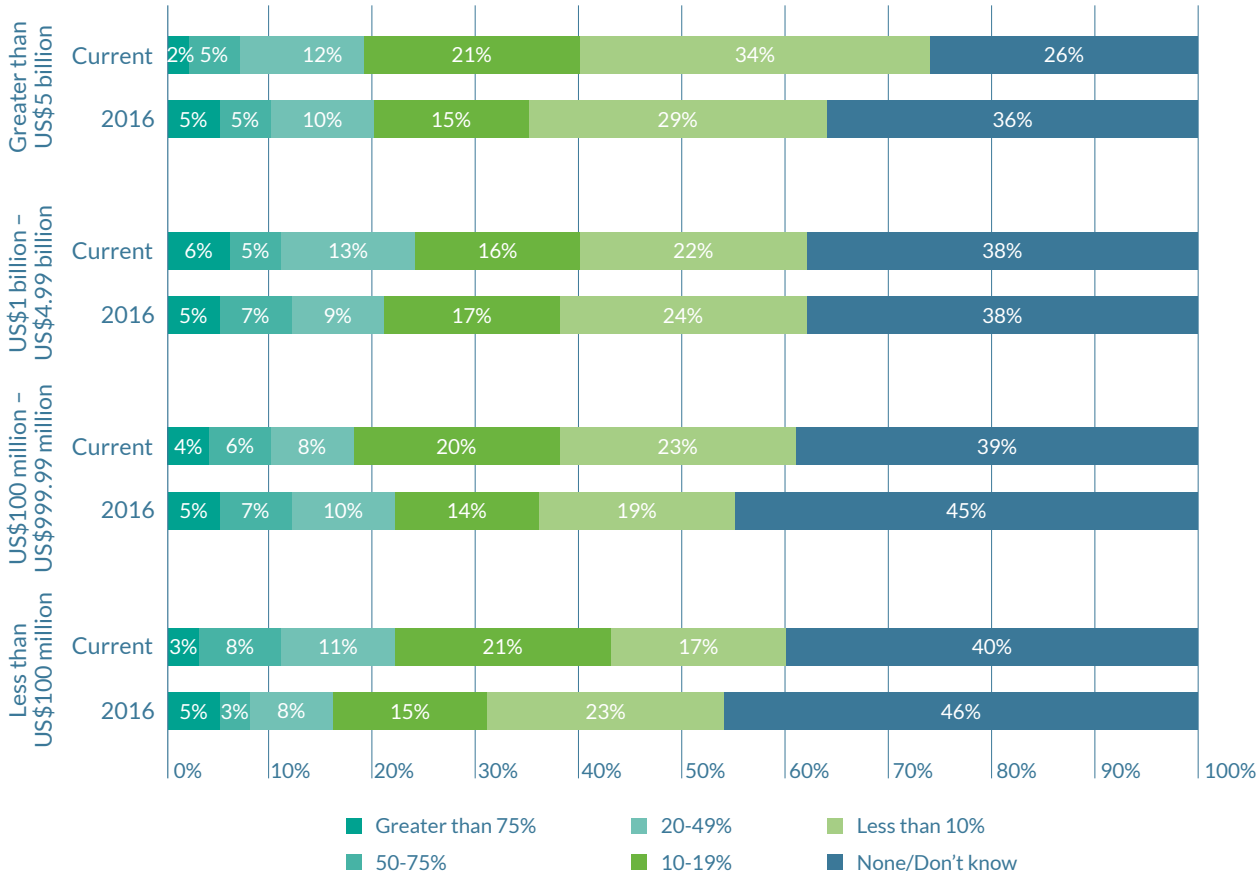
Region ("Yes" responses)



IT audit groups should evaluate whether they have the right skills to deliver against the evolving and increasingly technical IT risk landscape that most organizations face, either through enhancing their skills or internal resources, or augmenting their staffs with external expertise.

• • • What is the percentage of outside IT audit resource hours used compared to total IT audit hours?

Company Size (Annual Revenue)



• • • Please indicate the primary reason(s) your company uses outside resources to augment IT audit skills. (Multiple responses permitted)

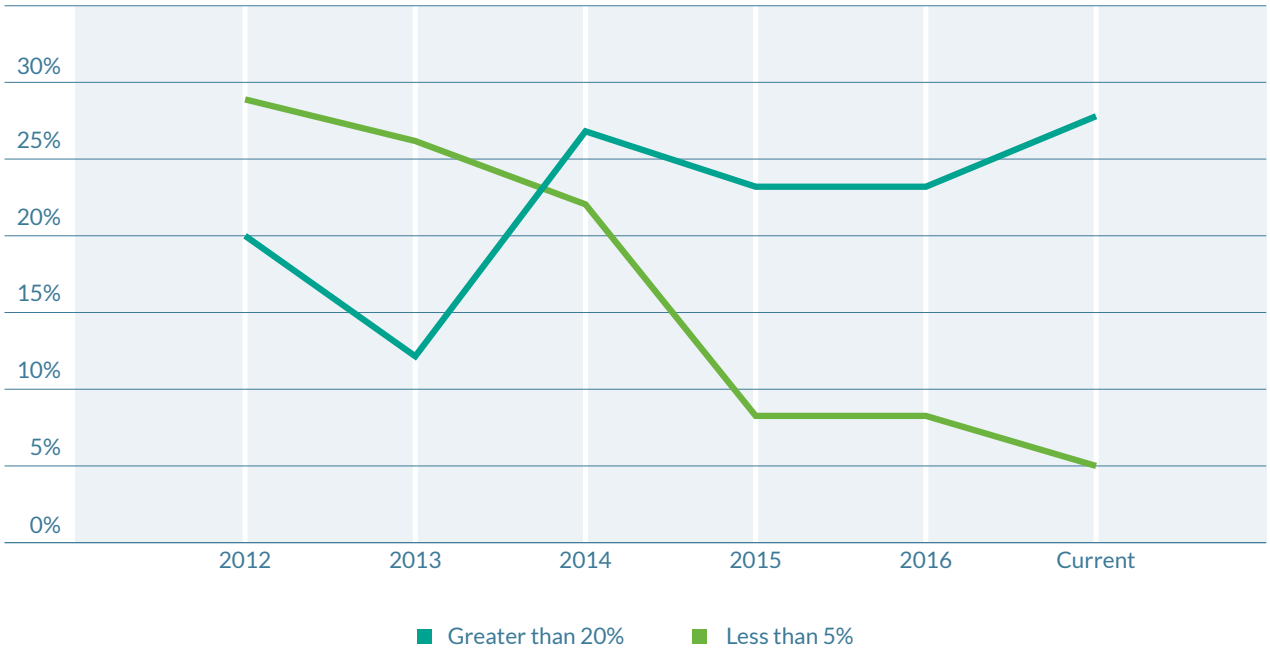
Company Size (Annual Revenue)

	Greater than US$5 billion	US$1 billion – US$4.99 billion	US$100 million – US$999.99 million	Less than US$100 million
Lack of resources	39%	38%	34%	32%
In-house internal audit department lacks IT audit skill sets	27%	25%	25%	26%
Different/outside perspectives	26%	23%	22%	24%
Provides the opportunity for people to learn from the experiences of outside resources	29%	22%	21%	22%
Variable resource modeling	20%	15%	12%	11%

Region

	Africa	Asia	Europe	Latin America/ South America	Middle East	North America	Oceania
Lack of resources	17%	36%	37%	20%	28%	40%	52%
In-house internal audit department lacks IT audit skill sets	32%	32%	25%	15%	17%	27%	19%
Different/outside perspectives	15%	32%	20%	20%	28%	24%	35%
Provides the opportunity for people to learn from the experiences of outside resources	22%	27%	23%	12%	21%	24%	32%
Variable resource modeling	7%	17%	14%	2%	14%	16%	29%

• • • Please indicate the number of IT audit reports issued as a percentage of the total reports issued by the internal audit department.



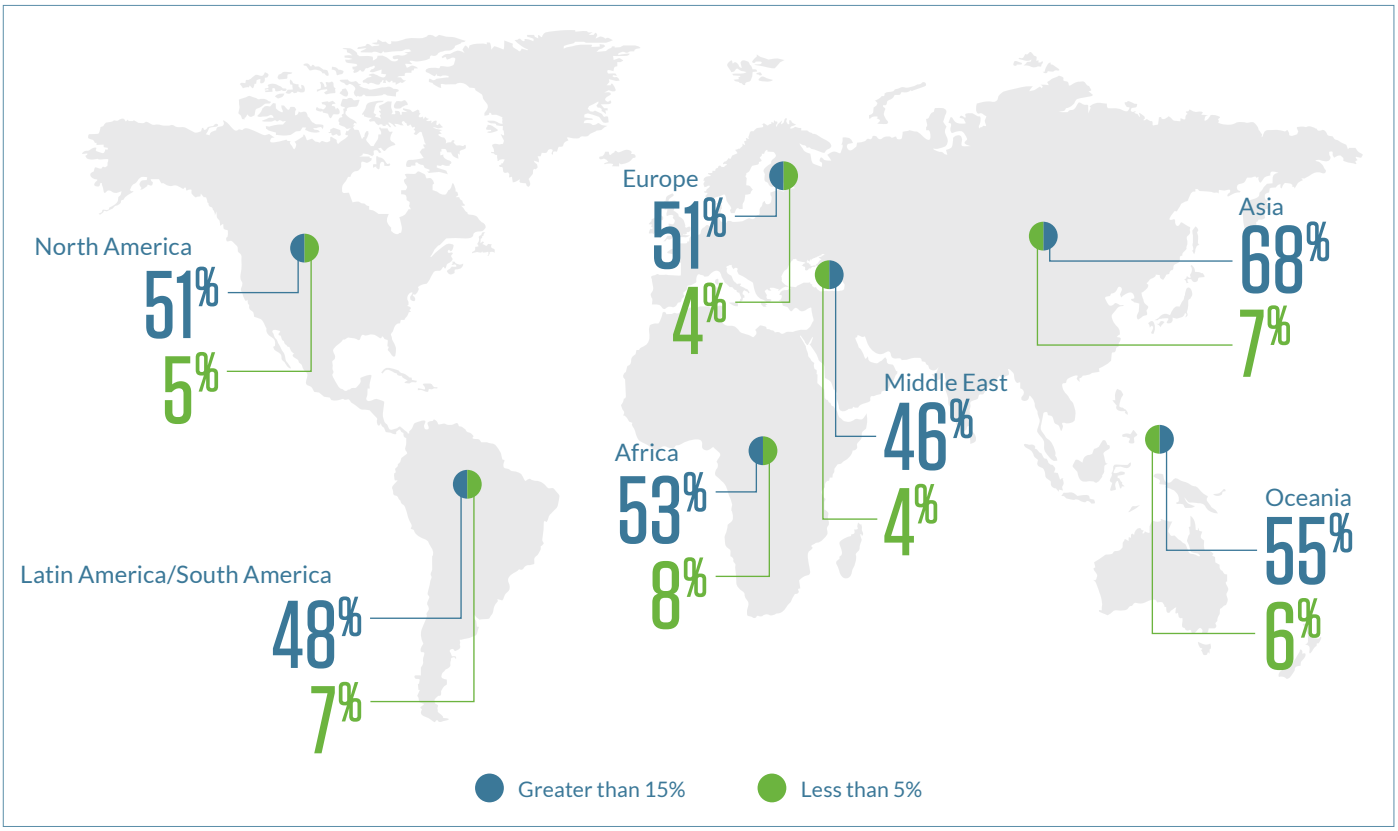
The number of IT audit reports issued has risen dramatically over the past four years.

• • • Please indicate the number of IT audit reports issued as a percentage of the total reports issued by the internal audit department.

Company Size (Annual Revenue)

	Greater than 20%	YOY Trend	15-20%	YOY Trend
Greater than US$5 billion	30%	↑	31%	↑
US$1 billion – US$4.99 billion	26%	↑	27%	↑
US$100 million – US$999.99 million	28%	↑	21%	↓
Less than US$100 million	25%	↑	19%	↑

Region



- - - **Please indicate the number of process audit reports (that included a review of the underlying technology) issued as a percentage of the total reports issued by the internal audit department.**

Company Size (Annual Revenue)

	Greater than US$5 billion	US$1 billion – US$4.99 billion	US$100 million – US$999.99 million	Less than US$100 million
Greater than 20%	33%	33%	31%	28%
15-20%	15%	14%	17%	20%
10-14%	16%	14%	18%	13%
5-9%	12%	8%	13%	12%
Less than 5%	9%	14%	11%	9%
None/Don't know	15%	17%	10%	18%

Region

	Africa	Asia	Europe	Latin America/ South America	Middle East	North America	Oceania
Greater than 20%	26%	38%	30%	36%	18%	32%	26%
15-20%	16%	20%	14%	25%	25%	16%	13%
10-14%	24%	12%	19%	11%	25%	13%	23%
5-9%	11%	7%	14%	9%	7%	11%	16%
Less than 5%	13%	15%	7%	9%	18%	11%	13%
None/Don't know	10%	8%	16%	10%	7%	17%	9%

• • • What is your organization's hiring plan for the next 12 months in relation to IT audit staff?

Company Size (Annual Revenue)

	Greater than US$5 billion	US$1 billion – US$4.99 billion	US$100 million – US$999.99 million	Less than US$100 million
Increase by more than 20%	5%	8%	6%	8%
Increase by 11% to 20%	7%	6%	4%	7%
Increase by 5% to 10%	18%	13%	13%	18%
Remain about the same	59%	60%	61%	51%
Reduce by 5% to 10%	1%	0%	1%	3%
Reduce by 11% to 20%	0%	1%	1%	0%
Reduce by more than 20%	1%	1%	1%	2%
Don't know	9%	11%	13%	11%

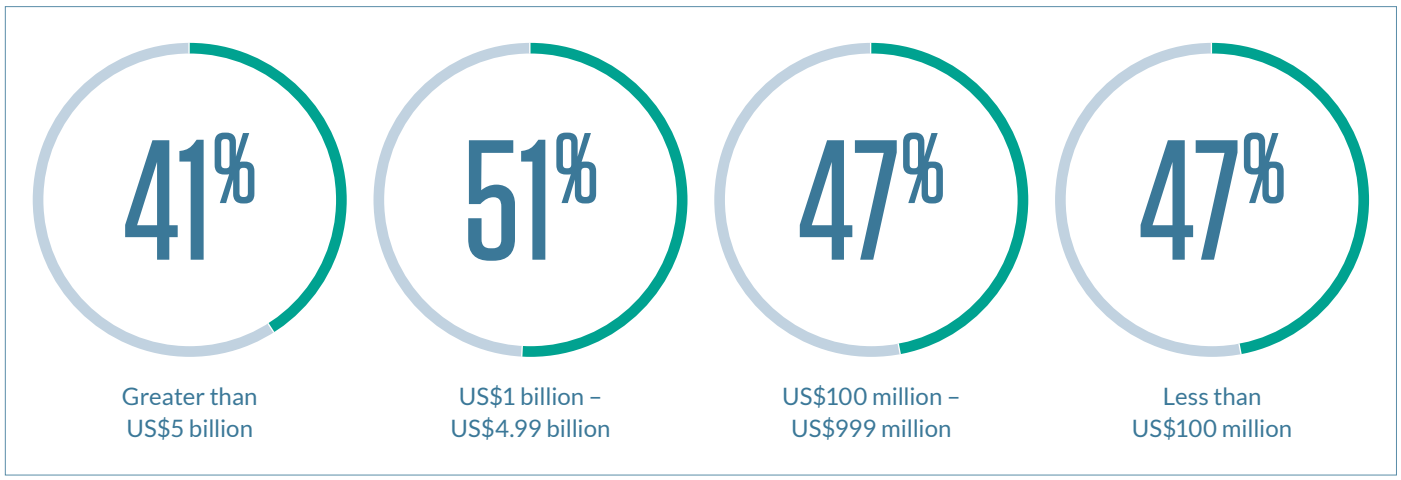
Region

	Africa	Asia	Europe	Latin America/ South America	Middle East	North America	Oceania
Increase by more than 20%	12%	0%	8%	6%	14%	5%	20%
Increase by 11% to 20%	6%	9%	7%	11%	5%	5%	4%
Increase by 5% to 10%	12%	30%	10%	25%	24%	15%	12%
Remain about the same	53%	42%	59%	42%	33%	65%	52%
Reduce by 5% to 10%	0%	2%	2%	3%	5%	0%	0%
Reduce by 11% to 20%	0%	0%	0%	0%	5%	0%	0%
Reduce by more than 20%	0%	4%	2%	0%	0%	0%	4%
Don't know	17%	13%	12%	13%	14%	10%	8%

Many IT audit groups plan to bring on more staff over the next 12 months.

- - - **Are there specific areas of your current IT audit plan that you are not able to address sufficiently due to lack of resources/skills? (Shown: "Yes" responses)**

Company Size (Annual Revenue)



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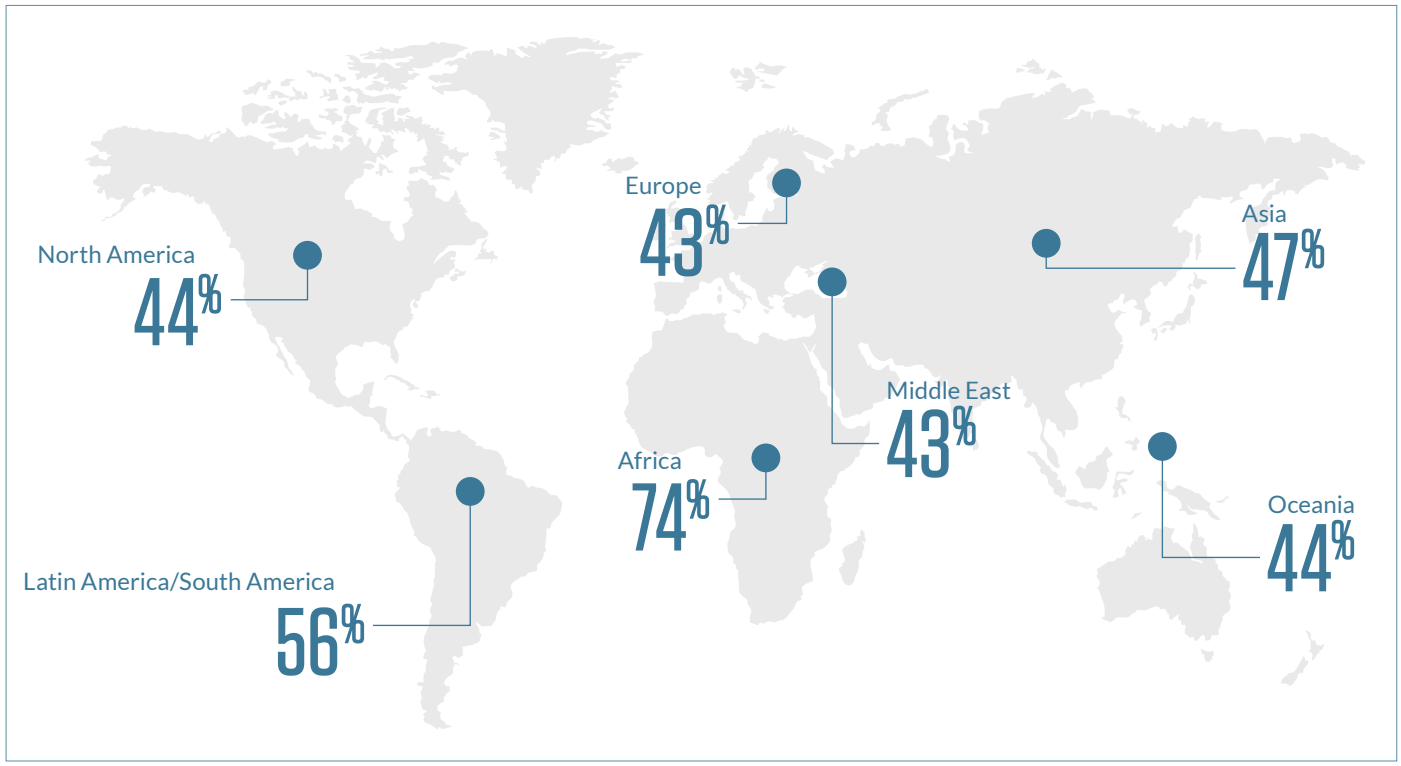
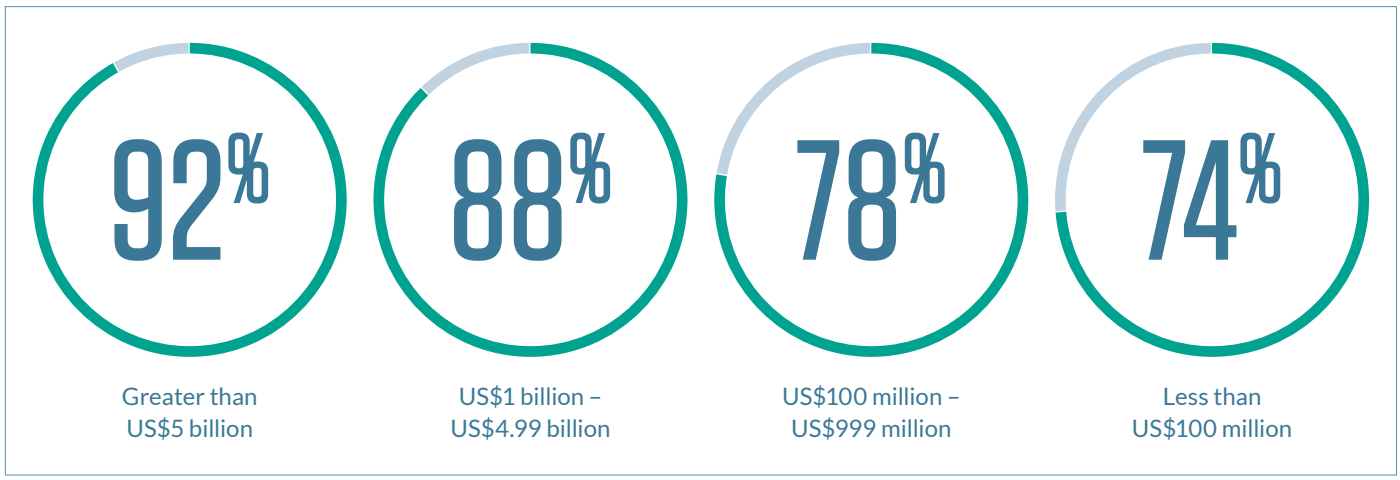


- - - **Are IT audits conducted by individuals who are full-time internal audit professionals in the internal audit department and who focus on IT audit projects? (Shown: "Yes" responses)**

Company Size (Annual Revenue)



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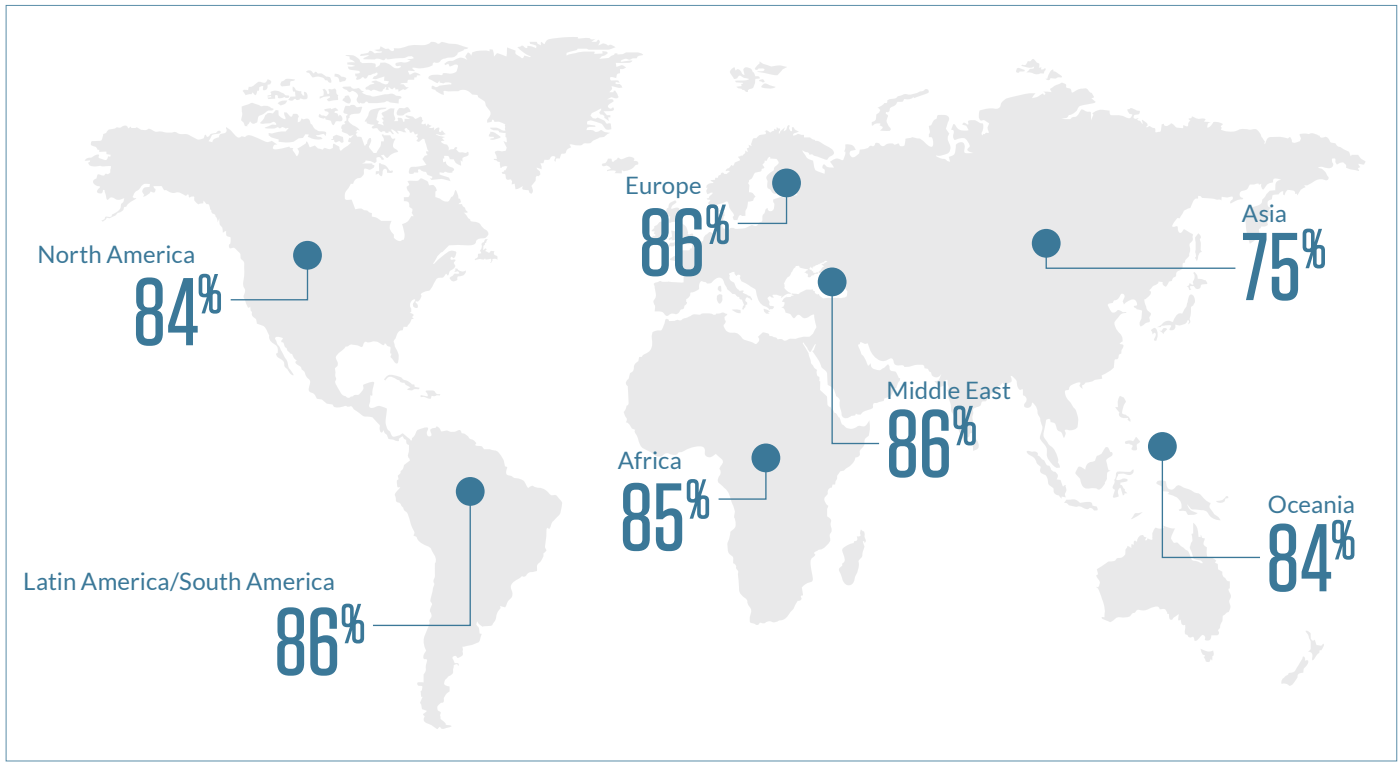


Assessing IT Risks Effectively — IT Audit Risk Assessments and the Audit Plan

In recent years, organizations have made significant gains in the frequency with which they conduct and update IT audit risk assessments. However, as is the case throughout our survey results, many companies still have room for improvement when it comes to the timing and nature of their IT audit risk assessments.

The segment of IT audit groups that demonstrate leading practices in IT risk assessments is growing, but it remains small. Relatively few IT audit groups integrate meaningful involvement in these risk assessments from the audit committee or executive management (although IT audit's access to these leaders may be limited), nor do they update their IT audit risk assessments on a frequent basis (at least quarterly). The rapid speed of technological innovation in the organization, including digitalization initiatives, as well as the rapidly evolving cyber threat landscape, should be drivers to performing IT audit risk assessments more frequently given the potential IT risks these activities may create.

On a positive note, progress is being made. While relatively few IT audit groups updated their IT audit risk assessments quarterly or more frequently last year (a practice we encourage), more than 40 percent of IT audit groups plan to update their IT audit risk assessments quarterly or more frequently in the coming year as a result of digitalization-related changes inside the organization. That said, more than 10 percent of organizations do not conduct any form of an IT audit risk assessment; this figure really ought to be at or near zero given the extensive (and increasing) reliance on technology by almost every organization. The pace of change of internal and external factors necessitates a need for frequent updates to the IT audit risk assessment or even continual monitoring of IT risk indicators.

Collaboration and advanced auditing tools and technology can prove effective in helping IT audit groups increase the frequency of their risk assessments. Healthier partnerships with executive management, the IT function, line-of-business executives and other stakeholders will help alert IT auditors to changes in various parts of the organization that create the need for a new or updated IT audit risk assessment. Audit analytics, continuous monitoring of risk and other indicators, and machine learning applications can provide similar signals that IT risks have evolved.

• • • Does your organization conduct an IT audit risk assessment?

Company Size (Annual Revenue)

	Greater than US$5 billion	US$1 billion – US$4.99 billion	US$100 million – US$999.99 million	Less than US$100 million
Yes, it is conducted as part of the overall internal audit risk assessment process	63%	66%	62%	54%
Yes, it is conducted separately from the overall internal audit risk assessment process	22%	17%	17%	16%
Yes, it is conducted by a group other than internal audit, but internal audit relies on the output to produce their audit plan	8%	6%	7%	11%
No, an IT audit risk assessment is not conducted	7%	11%	14%	19%

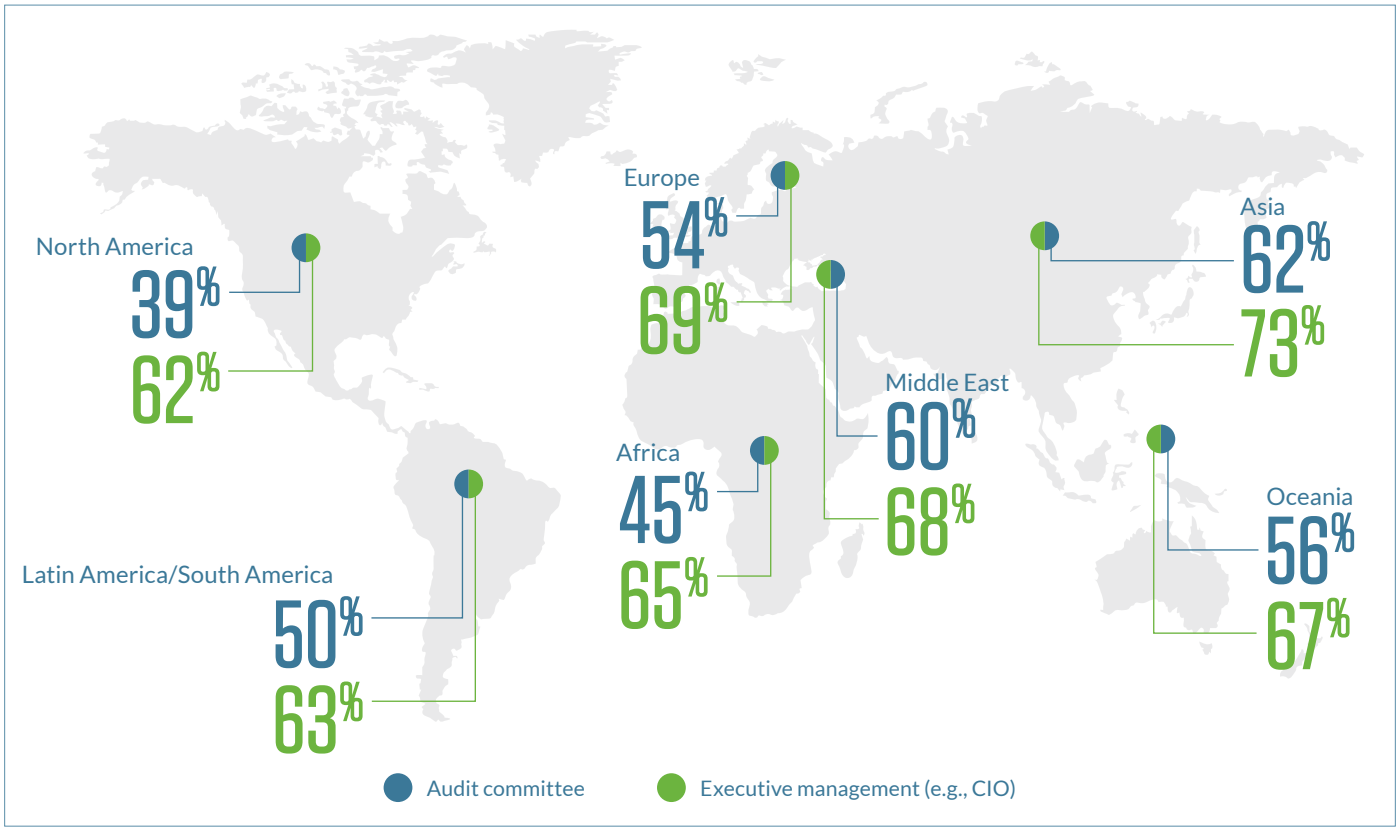
Region

	Africa	Asia	Europe	Latin America/ South America	Middle East	North America	Oceania
Yes, it is conducted as part of the overall internal audit risk assessment process	47%	50%	61%	43%	50%	67%	71%
Yes, it is conducted separately from the overall internal audit risk assessment process	13%	30%	17%	27%	32%	16%	16%
Yes, it is conducted by a group other than internal audit, but internal audit relies on the output to produce their audit plan	21%	8%	9%	9%	11%	6%	6%
No, an IT audit risk assessment is not conducted	19%	12%	13%	21%	7%	11%	7%

Small but meaningful numbers of IT audit groups do not conduct an IT audit risk assessment. A large number perform this assessment in isolation, which can limit its effectiveness.

• • • **Please indicate the level of involvement of each of the following individuals/groups in your organization's IT audit risk assessment process. (Shown: Significant/Moderate levels of involvement)**

Region



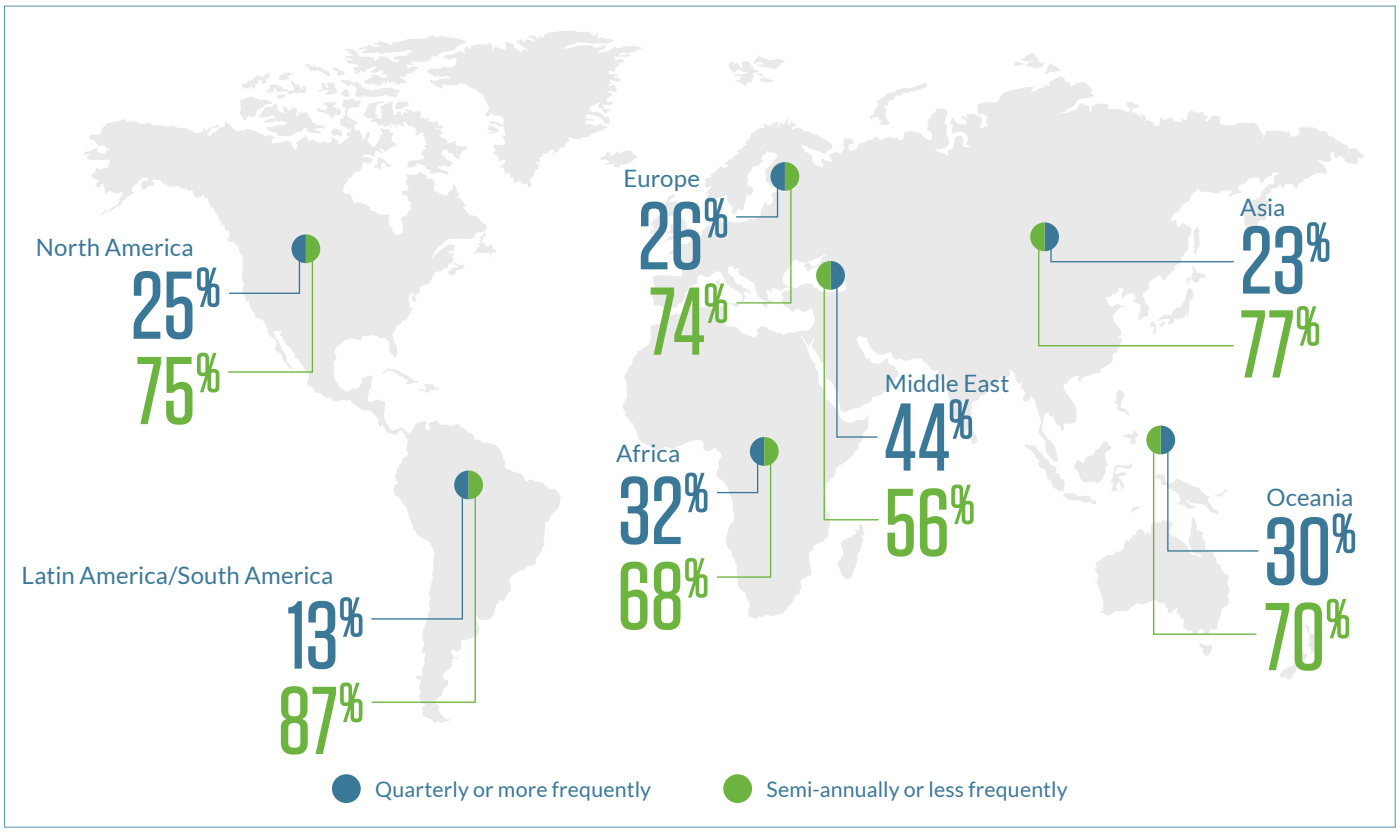
• • • Frequency with which the IT audit risk assessment is updated:

Company Size (Annual Revenue)

	Greater than US$5 billion	YOY Trend	US$1 billion – US$4.99 billion	YOY Trend	US$100 million – US$999.99 million	YOY Trend	Less than US$100 million	YOY Trend
Continually	19%	↑	11%	↔	8%	↑	14%	↔
Monthly	0%	↓	1%	↔	1%	↔	0%	↓
Quarterly	17%	↑	7%	↓	11%	↔	11%	↑
Semi-annually	11%	↓	10%	↑	10%	↓	7%	↑
Annually	48%	↓	67%	↑	63%	↑	58%	↓
Less than annually	5%	↑	4%	↓	7%	↑	8%	↔
Never	0%	↓	0%	↓	0%	↓	2%	↑

• • • Frequency with which the IT audit risk assessment is updated:

Region



GLOBAL LEADER
Middle East

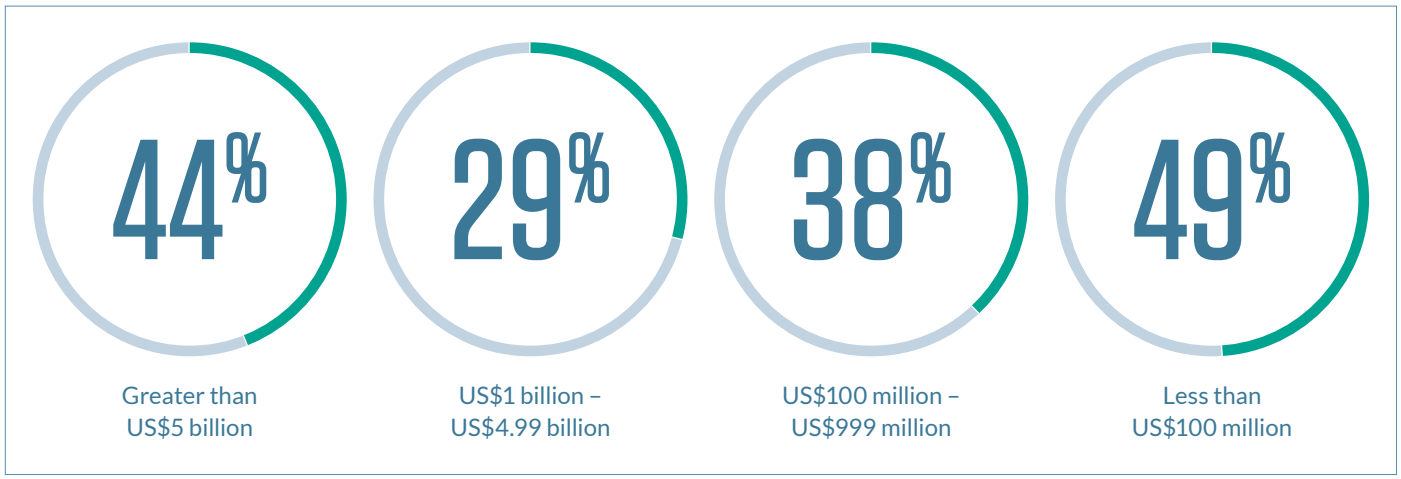
44% of organizations update their IT audit risk assessments at least quarterly.

Over the last several years, the IT audit risk assessment has aligned itself with the overall enterprise risk assessment. They use the same definitions and heat map so there is consistency in reporting of risks.

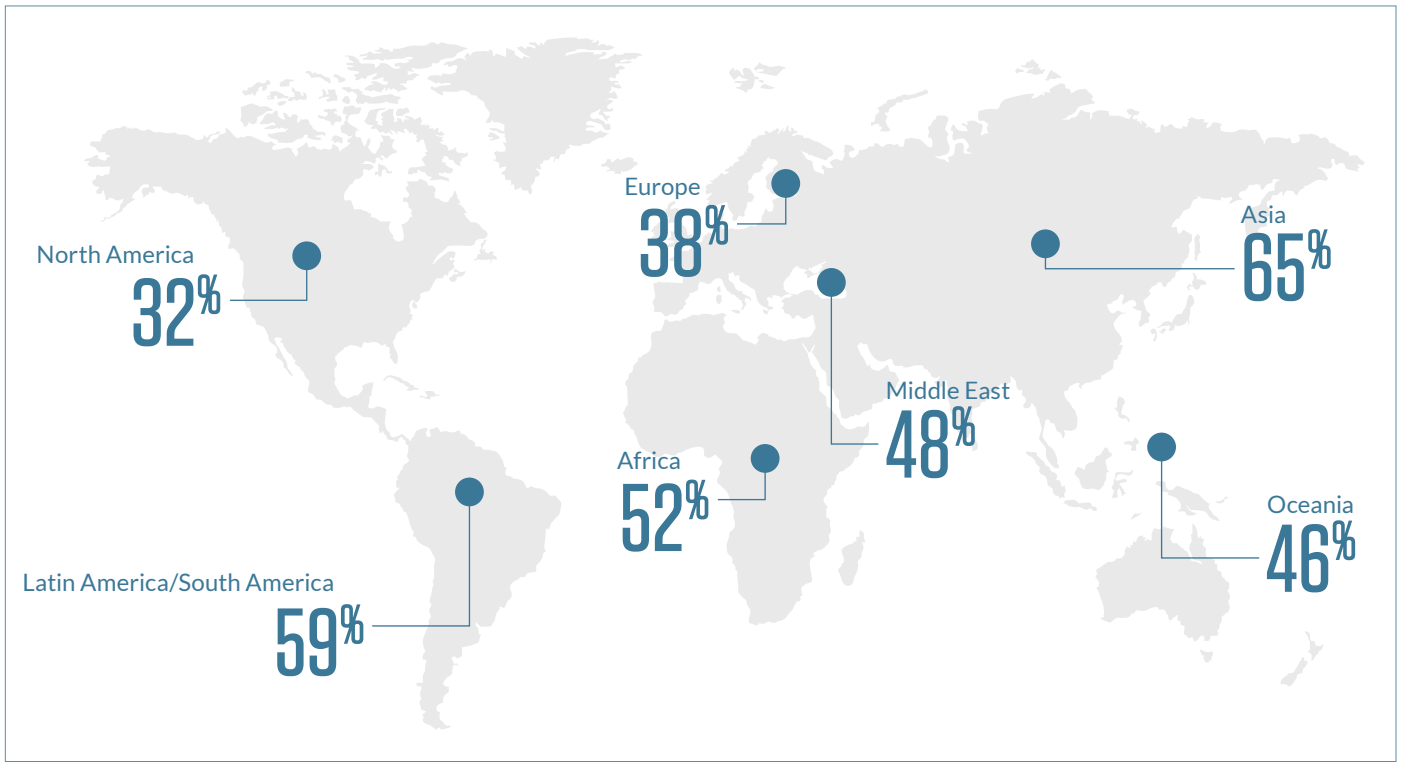
— Chief audit executive, large healthcare payer company, North America

- - - **Will digitalization efforts impact the frequency of updates made to your organization's fiscal 2018 IT audit risk assessment? (Shown: "Yes" responses)**

Company Size (Annual Revenue)



Region



• • • How frequently will your IT audit risk assessment be updated in fiscal 2018 due to digitalization changes within your organization?

Company Size (Annual Revenue)

	Greater than US$5 billion	US$1 billion – US$4.99 billion	US$100 million – US$999.99 million	Less than US$100 million
Continually	26%	11%	8%	22%
Monthly	2%	2%	3%	2%
Quarterly	28%	19%	22%	18%
Semi-annually	22%	23%	25%	31%
Annually	18%	43%	39%	18%
Less than annually	4%	2%	3%	7%
Never	0%	0%	0%	2%

Region

	Africa	Asia	Europe	Latin America/ South America	Middle East	North America	Oceania
Continually	31%	15%	20%	0%	0%	21%	17%
Monthly	13%	3%	2%	0%	0%	2%	0%
Quarterly	19%	24%	26%	16%	42%	20%	33%
Semi-annually	25%	15%	30%	42%	25%	22%	33%
Annually	12%	43%	20%	26%	25%	31%	17%
Less than annually	0%	0%	2%	16%	0%	4%	0%
Never	0%	0%	0%	0%	8%	0%	0%

Digitalization-driven changes in the organization are influencing the frequency of IT audit risk assessments. Interestingly, these responses indicate a significantly higher level of frequency in updates to the IT audit risk assessment compared to the general question on frequency (see page 48).

• • • Which of the following activities is your IT audit function responsible for? (Multiple responses permitted)

Region

	Africa	Asia	Europe	Latin America/ South America	Middle East	North America	Oceania
Collecting and analyzing data analytics	63%	46%	47%	76%	30%	46%	68%
Conducting application audits	92%	76%	78%	85%	85%	79%	93%
Conducting cyber security audits	63%	68%	67%	61%	63%	75%	79%
Conducting integrated audits	66%	61%	65%	71%	44%	68%	61%
Conducting IT fraud investigations	39%	31%	37%	46%	37%	31%	29%
Conducting IT general control audits	84%	85%	88%	85%	85%	87%	96%
Conducting IT governance audits	71%	64%	75%	66%	63%	67%	82%
Conducting IT infrastructure audits	74%	64%	77%	76%	67%	71%	54%
Conducting IT process audits	82%	78%	82%	83%	67%	78%	79%
Conducting penetration testing	37%	22%	15%	20%	22%	20%	21%
Conducting physical security audits	66%	64%	50%	61%	37%	54%	57%
Conducting pre- and post-implementation audits	66%	51%	57%	51%	33%	59%	71%
Conducting social engineering audits	26%	17%	15%	17%	15%	14%	21%
Conducting social media audits	18%	12%	20%	20%	11%	19%	32%
Conducting vendor audits	37%	36%	36%	46%	19%	36%	36%
Conducting vulnerability assessments	55%	27%	28%	39%	22%	23%	25%
Maintaining internal control framework documentation	24%	22%	19%	20%	11%	24%	14%
PCI DSS	21%	15%	15%	15%	15%	20%	21%
Performing continuous auditing	45%	25%	25%	46%	22%	25%	39%
Providing consultative services	55%	42%	41%	44%	26%	58%	54%
Providing external audit support	39%	27%	29%	37%	15%	45%	21%
Testing for IT Sarbanes-Oxley or other related country-specific compliance	13%	20%	17%	22%	0%	52%	7%
Testing IT compliance	58%	44%	46%	54%	41%	57%	25%
Testing business continuity/disaster recovery plans	58%	46%	43%	56%	44%	54%	46%

• • • Of the total number of IT audits conducted annually, what percentage of total IT audit hours are spent on the following areas?

Company Size (Annual Revenue) — Top 3 Audit Areas

	Greater than US$5 billion	US$1 billion – US$4.99 billion	US$100 million – US$999.99 million	Less than US$100 million
Conducting IT general control audits	●	●	●	●
Testing for IT Sarbanes-Oxley or other related country-specific compliance	●	●		
Conducting application audits	●	●	●	●
Conducting integrated audits			●	
Collecting and analyzing data analytics				●

Region — Top 3 Audit Areas

	Africa	Asia	Europe	Latin America/ South America	Middle East	North America	Oceania
Testing for IT Sarbanes-Oxley or other related country-specific compliance						●	
Conducting IT general control audits	●	●	●	●	●	●	●
Conducting cyber security audits		●					●
Conducting integrated audits						●	
Conducting application audits	●	●	●	●	●		
Collecting and analyzing data analytics	●			●			
Conducting IT process audits			●		●		●

• • • On which of the following accepted industry framework(s) is the IT audit risk assessment based? (Multiple responses permitted)

Region

	Africa	Asia	Europe	Latin America/ South America	Middle East	North America	Oceania
COBIT	61%	62%	68%	94%	52%	63%	63%
COSO	32%	37%	31%	53%	28%	47%	22%
ISO	68%	44%	34%	44%	52%	15%	41%
NIST CSF	10%	12%	13%	9%	8%	39%	15%
ITIL	32%	33%	31%	34%	32%	15%	33%
Basel III	6%	4%	10%	6%	16%	1%	0%

• • • What percentage of time does the IT audit function spend on assurance vs. compliance vs. consulting activities?

Company Size (Annual Revenue)

	Greater than 75%	50-75%	25-49%	15-24%	1-14%	None/Don't know
Greater than US$5 billion						
Assurance	25%	24%	28%	12%	7%	4%
Compliance	5%	14%	30%	26%	18%	7%
Consulting	0%	3%	14%	26%	44%	13%
US$1 billion – US$4.99 billion						
Assurance	24%	32%	22%	13%	4%	5%
Compliance	10%	12%	21%	26%	23%	8%
Consulting	2%	5%	10%	31%	40%	12%
US$100 million – US$999.99 million						
Assurance	23%	31%	23%	12%	5%	6%
Compliance	7%	11%	26%	24%	20%	12%
Consulting	1%	3%	16%	27%	40%	13%
Less than US$100 million						
Assurance	20%	27%	26%	14%	5%	8%
Compliance	11%	12%	29%	26%	12%	10%
Consulting	2%	12%	18%	21%	32%	15%

What percentage of time does the IT audit function spend on assurance vs. compliance vs. consulting activities?

Region

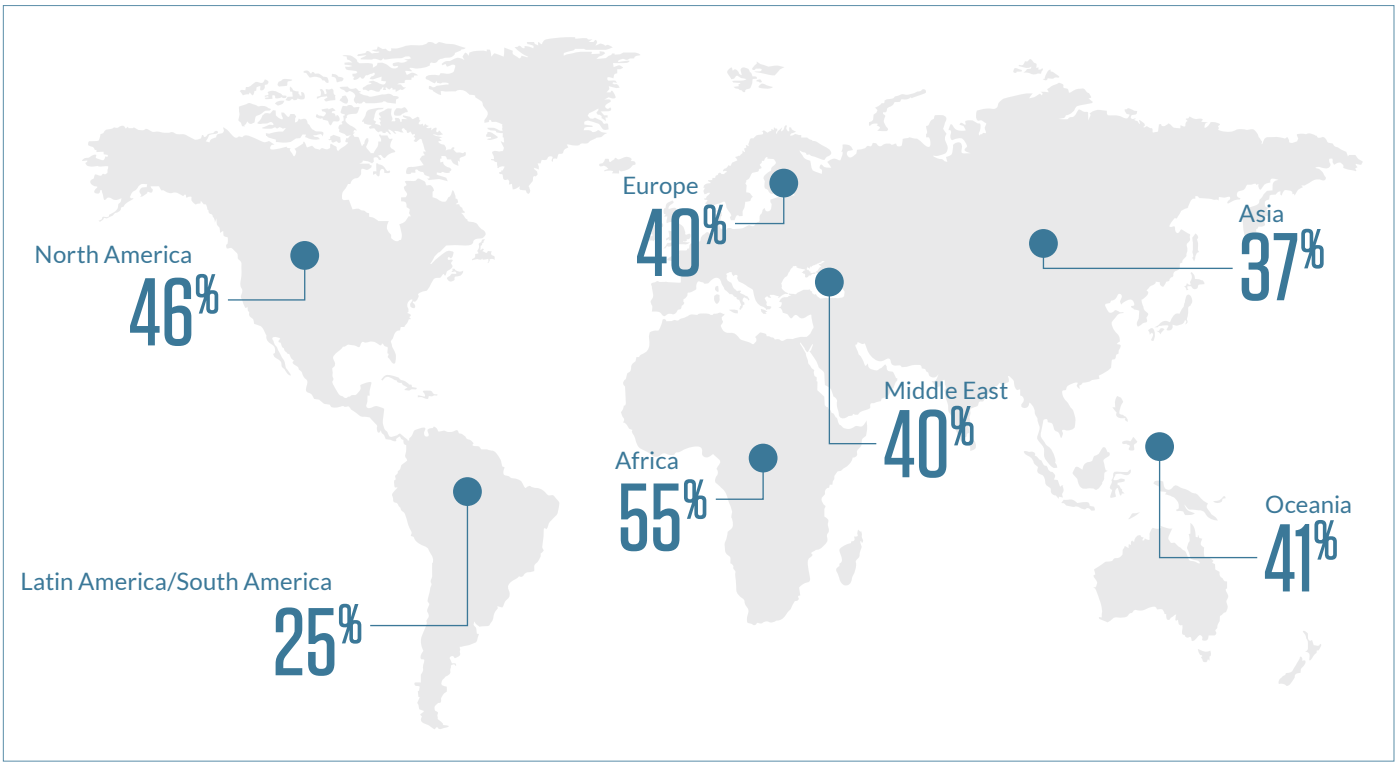
	Greater than 75%	50-75%	25-49%	15-24%	1-14%	None/Don't know
Africa						
Assurance	41%	35%	15%	6%	0%	3%
Compliance	6%	9%	21%	29%	24%	11%
Consulting	3%	6%	15%	26%	41%	9%
Asia						
Assurance	22%	35%	28%	4%	11%	0%
Compliance	11%	13%	31%	26%	17%	2%
Consulting	2%	11%	19%	30%	35%	3%
Europe						
Assurance	31%	23%	21%	15%	2%	8%
Compliance	3%	12%	25%	30%	18%	12%
Consulting	1%	5%	8%	24%	44%	18%
Latin America/South America						
Assurance	16%	47%	11%	13%	8%	5%
Compliance	18%	3%	32%	21%	18%	8%
Consulting	0%	13%	13%	26%	39%	9%
Middle East						
Assurance	19%	14%	48%	5%	10%	4%
Compliance	5%	10%	29%	24%	24%	10%
Consulting	0%	5%	24%	14%	38%	19%
North America						
Assurance	19%	28%	26%	15%	6%	6%
Compliance	9%	15%	26%	23%	18%	9%
Consulting	1%	3%	15%	28%	40%	13%
Oceania						
Assurance	36%	32%	28%	0%	0%	4%
Compliance	4%	0%	32%	24%	28%	12%
Consulting	0%	0%	28%	24%	32%	16%

- - - **If your company has an ERM program, does the IT audit risk framework used for the risk assessment link to the ERM framework? (Shown: "Yes" responses)**

Company Size (Annual Revenue)

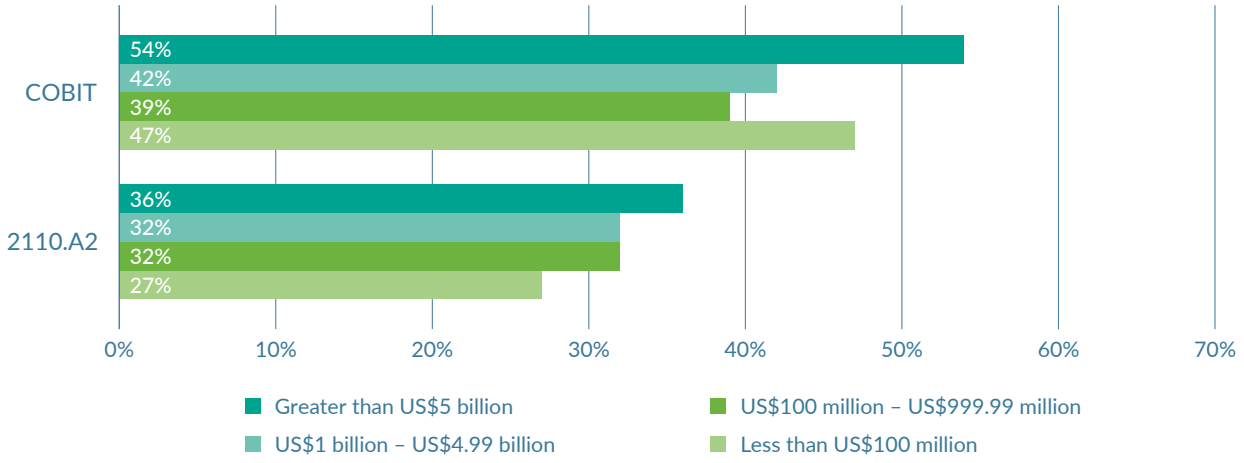
Greater than US$5 billion			US$1 billion – US$4.99 billion			US$100 million – US$999.99 million			Less than US$100 million		
Current	2016	2015	Current	2016	2015	Current	2016	2015	Current	2016	2015
49%	47%	47%	39%	36%	40%	42%	42%	44%	39%	33%	34%

Region



• • • **Has your IT audit activity completed an evaluation and assessment of your organization's IT governance process, in accordance with ISACA's COBIT Framework and IIA Standard 2110.A2? (Shown: "Yes" responses)**

Company Size (Annual Revenue)



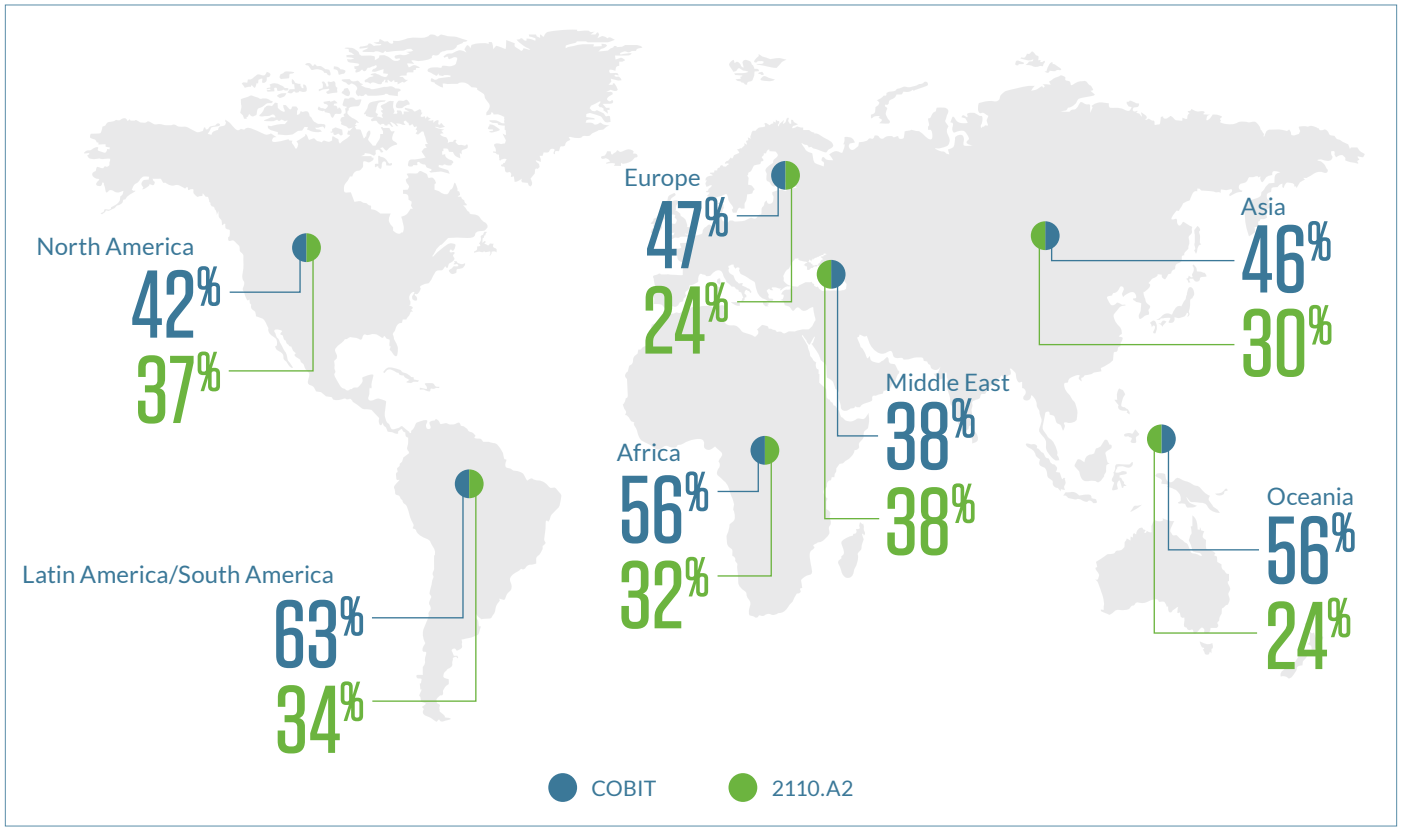
COBIT 5 is the latest edition of ISACA's globally accepted framework, providing an end-to-end business view of the governance of enterprise IT that reflects the central role of information and technology in creating value for enterprises. The principles, practices, analytical tools and models found in COBIT 5 embody thought leadership and guidance from business, IT and governance experts around the world.

IIA Standard 2110.A2 states, "The internal audit activity must assess whether information technology governance of the organization sustains and supports the organization's strategies and objectives."

Source: The Institute of Internal Auditors International Professional Practices Framework

- - - **Has your IT audit activity completed an evaluation and assessment of your organization's IT governance process, in accordance with ISACA's COBIT Framework and IIA Standard 2110.A2? (Shown: "Yes" responses)**

Region



GLOBAL LEADER
Latin America/South America

63% of organizations have completed an evaluation and assessment of their IT governance process, in accordance with ISACA's COBIT Framework.

GLOBAL LEADER
Middle East

38% of organizations have completed an evaluation and assessment of their IT governance process, in accordance with IIA Standard 2110.A2.

- - - **If you answered "No" to the previous question, indicate whether you intend to complete an evaluation and assessment of your organization's IT governance process.**

Company Size (Annual Revenue)

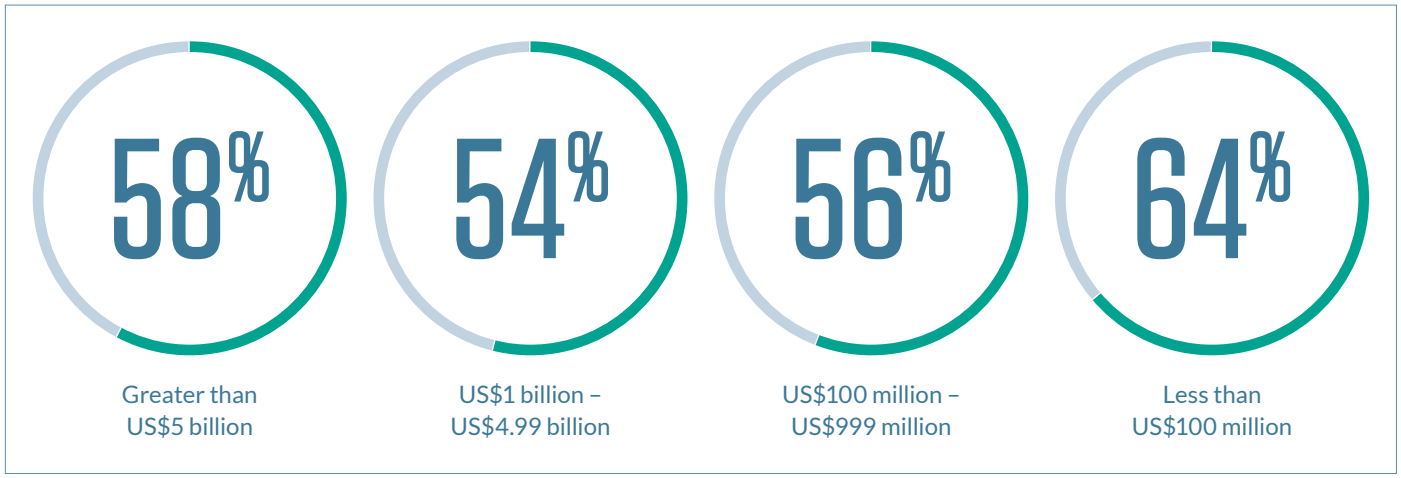
	Yes, within the next year		Yes, but not within the next year	
	COBIT	2110.A2	COBIT	2110.A2
Greater than US$5 billion	12%	9%	22%	18%
US$1 billion – US$4.99 billion	20%	16%	27%	18%
US$100 million – US$999.99 million	11%	13%	27%	29%
Less than US$100 million	22%	10%	28%	31%

Region

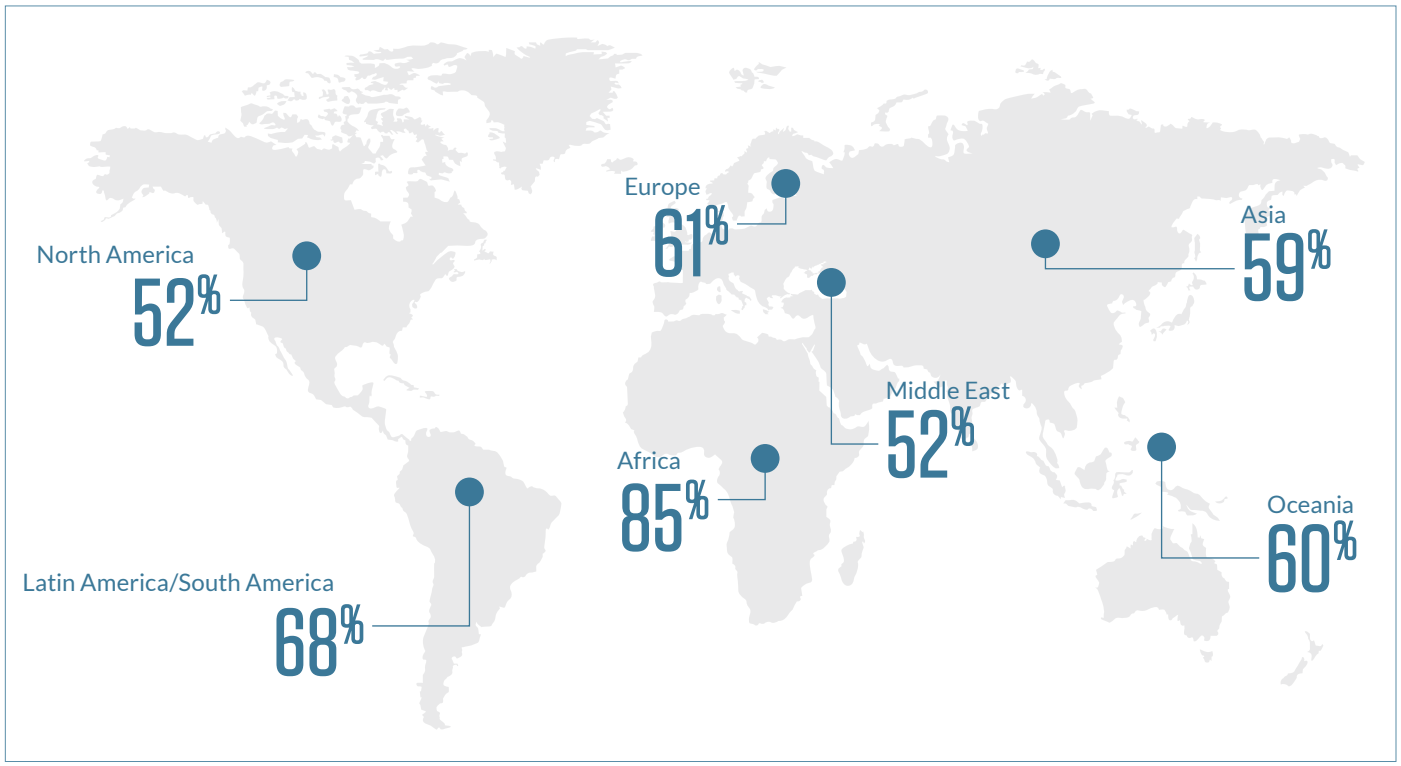
	Yes, within the next year		Yes, but not within the next year	
	COBIT	2110.A2	COBIT	2110.A2
Africa	53%	17%	27%	43%
Asia	7%	13%	38%	21%
Europe	10%	9%	26%	19%
Latin America/South America	7%	16%	36%	24%
Middle East	38%	15%	8%	15%
North America	16%	12%	24%	24%
Oceania	9%	16%	45%	26%

- - - **When planning, conducting and reporting the results of IT audits, does the IT audit function utilize ISACA's standards, guidelines and procedures, as incorporated in ITAF (Information Technology Assurance Framework)? (Shown: "Yes" responses)**

Company Size (Annual Revenue)

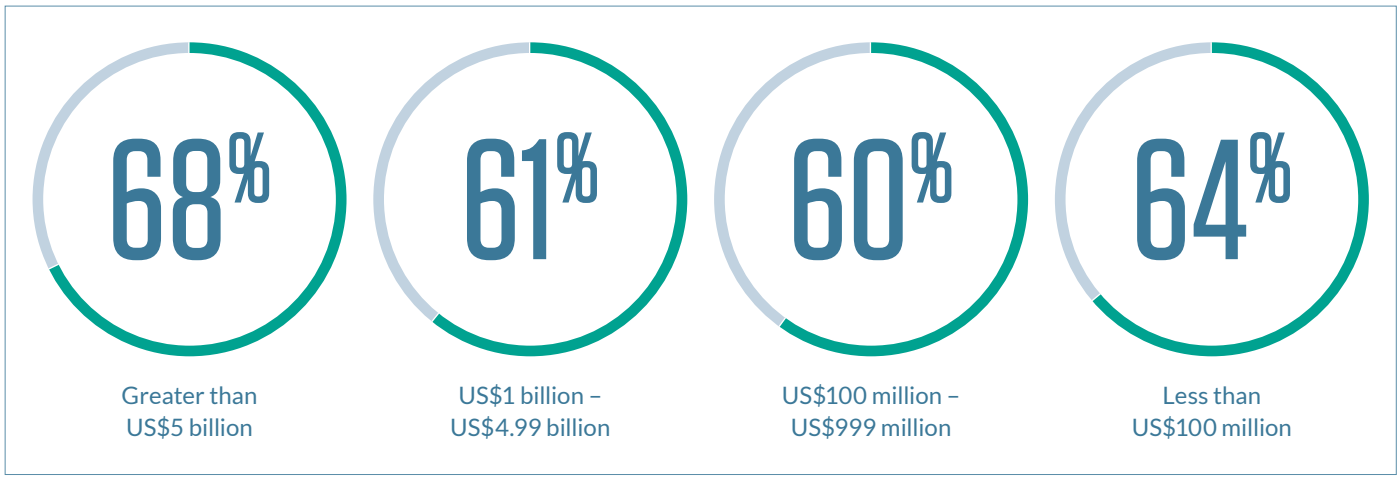


Region

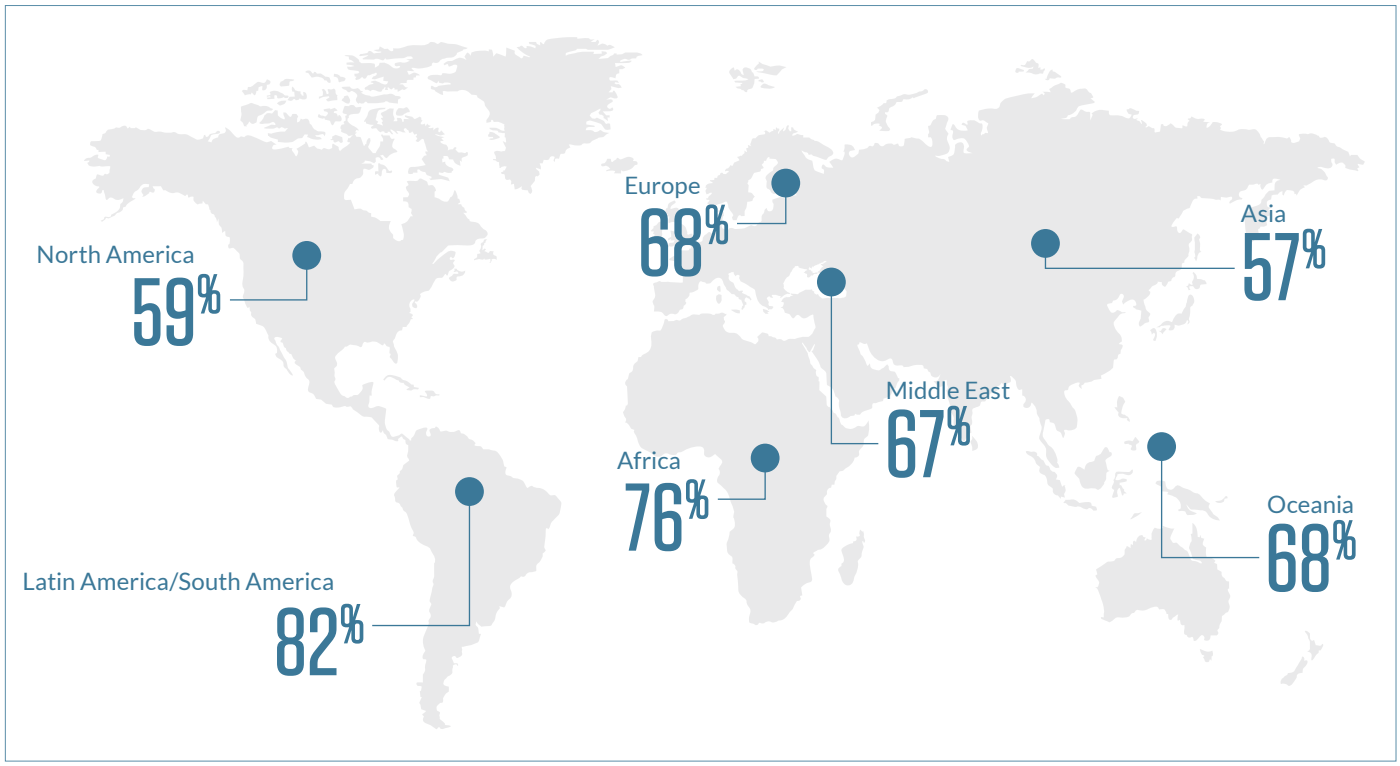


- - - **When performing IT process assessments, does the IT audit function use ISACA's COBIT Framework? (Shown: "Yes" responses)**

Company Size (Annual Revenue)

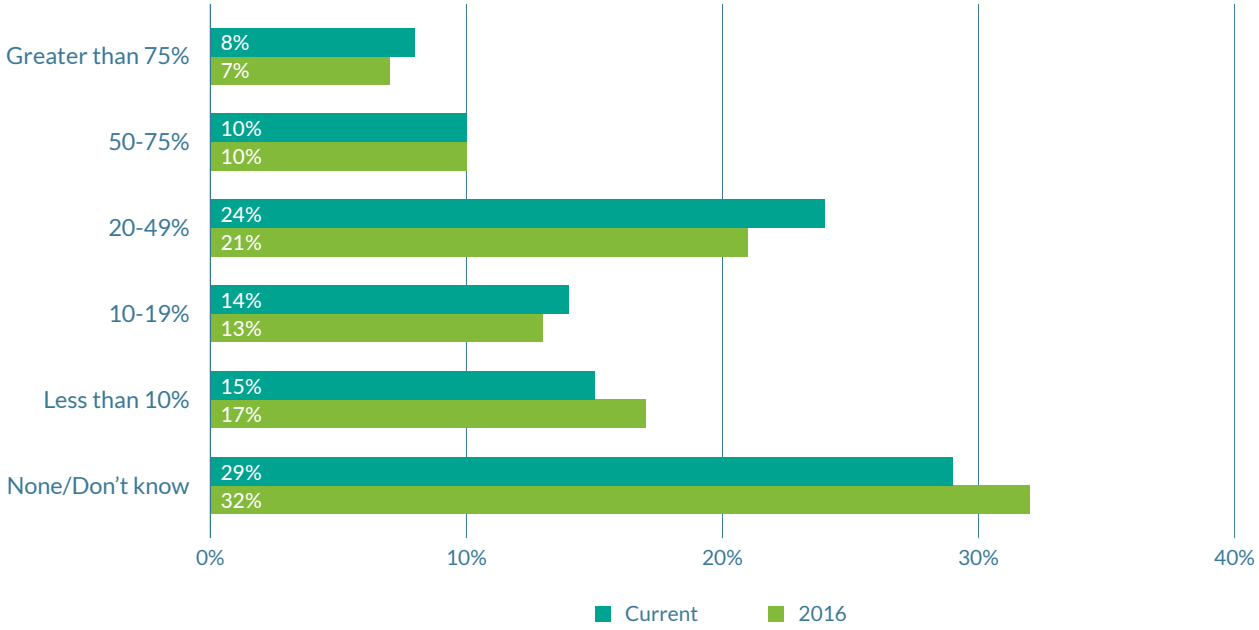


Region



• • • **In your most recently completed year of Sarbanes-Oxley (SOX) compliance, what percentage of your organization's IT audit hours are associated with SOX-related activities?**

Base: Respondents required to comply with the U.S. Sarbanes-Oxley Act



Demographics

Position

Chief Audit Executive (or equivalent)	13%
IT Audit Director	14%
Audit Director	4%
IT Audit Manager	30%
Audit Manager	6%
IT Audit Staff	21%
Audit Staff	5%
Other	7%

Industry

Financial Services	26%
Government/Education/Not-for-Profit	13%
Insurance	7%
Manufacturing/Engineering	7%
Professional Services	6%
Energy	4%
Healthcare Provider	4%
Technology	4%
Retail	3%
Technology Services Consulting	3%
Telecommunications	3%
Consumer Products	2%
Real Estate	2%
Utility	2%
Distribution and Transportation	1%
Healthcare Payer	1%
Hospitality	1%
Life Sciences/Biotechnology	1%
Media	1%
Transportation	1%
Other	8%

Size of Organization (by gross annual revenue in U.S. dollars)

$20 billion or greater	14%
$10 billion to $19.99 billion	7%
$5 billion to $9.99 billion	9%
$1 billion to $4.99 billion	23%
$500 million to $999.99 million	11%
$100 million to $499.99 million	15%
Less than $100 million	21%

Type of Organization

Publicly traded	39%
Private	34%
Government	17%
Not-for-profit	8%
Other	2%

Organization Headquarters

North America	52%
Europe	22%
Asia	9%
Latin America/South America	5%
Africa	5%
Middle East	4%
Oceania	3%

IT Audit Department Headquarters

North America	51%
Europe	21%
Asia	9%
Latin America/South America	6%
Africa	6%
Middle East	4%
Oceania	3%

Audit Department Headcount

Less than 5	18%
5 to 9	20%
10 to 19	19%
20 to 29	11%
More than 30	32%

Total Number of Full-Time IT Auditors

0	7%
1	23%
2	16%
3	10%
4	7%
5	7%
6-10	15%
More than 11	15%

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PROTIVITI INTERNAL AUDIT AND FINANCIAL ADVISORY PRACTICE — CONTACT INFORMATION

Brian Christensen
Executive Vice President,
Global Internal Audit
+1.602.273.8020
brian.christensen@protiviti.com

Andrew Struthers-Kennedy
Managing Director
Leader, IT Audit Practice
+1.410.454.6879
andrew.struthers-kennedy@protiviti.com

AUSTRALIA

Adam Christou
+61.03.9948.1200
adam.christou@protiviti.com.au

BELGIUM

Jaap Gerkes
+31.6.1131.0156
jaap.gerkes@protiviti.nl

BRAZIL

Raul Silva
+55.11.2198.4200
raul.silva@protiviti.com.br

CANADA

Ram Balakrishnan
+1.647.288.8525
ram.balakrishnan@protiviti.com

CHINA (HONG KONG AND MAINLAND CHINA)

Albert Lee
+852.2238.0499
albert.lee@protiviti.com

FRANCE

Bernard Drui
+33.1.42.96.22.77
b.drui@protiviti.fr

GERMANY

Michael Klinger
+49.69.963.768.155
michael.klinger@protiviti.de

INDIA

Sanjeev Agarwal
+91.99.0332.4304
sanjeev.agarwal@protivitiglobal.in

ITALY

Alberto Carnevale
+39.02.6550.6301
alberto.carnevale@protiviti.it

JAPAN

Yasumi Taniguchi
+81.3.5219.6600
yasumi.taniguchi@protiviti.jp

MEXICO

Roberto Abad
+52.55.5342.9100
roberto.abad@protivitiglobal.com.mx

MIDDLE EAST

Sanjeev Agarwal
+965.2295.7770
sanjeev.agarwal@protivitiglobal.me

THE NETHERLANDS

Jaap Gerkes
+31.6.1131.0156
jaap.gerkes@protiviti.nl

SINGAPORE

Sidney Lim
+65.6220.6066
sidney.lim@protiviti.com

UNITED KINGDOM

Lindsay Dart
+44.207.389.0448
lindsay.dart@protiviti.co.uk

UNITED STATES

Brian Christensen
+1.602.273.8020
brian.christensen@protiviti.com

www.isaca.org
Phone: +1.847.253.1545
Fax: +1.847.253.1443
Email: research@isaca.org

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