THE **FUTURE** OF
IT AUDIT

Abstract

The Future of IT Audit: Research Brief details the results of a survey conducted by ISACA with IT auditors in August 2018.

The survey results show that auditors are increasingly becoming an integral part of or strong partners to an organization's technology team, with 82 percent of respondents indicating they are moderately or significantly involved in technology projects within their organizations. Auditors expect their level of involvement to improve in the next three to five years.

The survey results also show an increased demand for technical skills and the impact new technologies may have on the IT audit profession. Despite the advancement of automation and artificial intelligence (AI), most predict an increase in the number of IT audit professionals needed to meet the challenges of these new technologies. There is, however, widespread belief that the role of the auditor will change in the future, affording the audit professional an opportunity to bring increased value to the enterprise.

The survey results show that auditors are increasingly becoming an integral part of or strong partners to an organization's technology team....

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Executive Summary

ISACA's *The Future of IT Audit: Research Brief* reveals the opportunities and challenges that await the IT audit professional and sheds light on the IT audit profession in general. In this paper, ISACA presents survey findings related to the involvement of auditors in technology projects within their enterprise, the technology challenges faced by auditors, the perceived impact of automation and artificial intelligence (AI), and the IT audit staffing implications and workforce development issues caused by new technologies.

Key Findings

IT audit professionals know the challenges they face every day, which include everything from new technologies to limited staff with the appropriate technical training and depth of knowledge to perform their jobs. But the survey results generally show an optimism on the part of IT auditors to meet these challenges and thrive in this changing environment.

Key findings from the survey include:

▶ **Auditors are increasingly involved in enterprise technology projects.**

The vast majority of auditors indicated they had a significant (44 percent) or moderate (38 percent) impact on technology projects within their organization. There is room for improvement on when auditors are brought into projects, with 28 percent of respondents reporting they were not brought into technology projects until post-implementation. On the upside, nearly half of all respondents (47 percent) reported IT auditors would become significantly more involved in technology projects in the next three to five years.

▶ **Auditors' technical skills must increase as audit automation increases.**

IT auditors noted that there is a strong demand for technical skills today. Simultaneously, auditors indicate that there is an increased expectation of expertise across a broader subject area. Somewhat contrary, or perhaps as an outgrowth of that expectation, is the notion that the IT audit team should be enhanced with data scientists. With these skills in place, an IT team will be better able to meet the challenges of automation.

▶ **Technology's impact on staffing size is uncertain.**

Overall, auditors are optimistic (92 percent) when considering how technology will impact them professionally over the next five years. But there is uncertainty about the impact that automation and AI may have on staffing levels. Auditors are split on whether AI will replace all or some of the role of the IT auditor in the next three to five years, with 37 percent saying it is likely, and 42 percent saying it is unlikely.

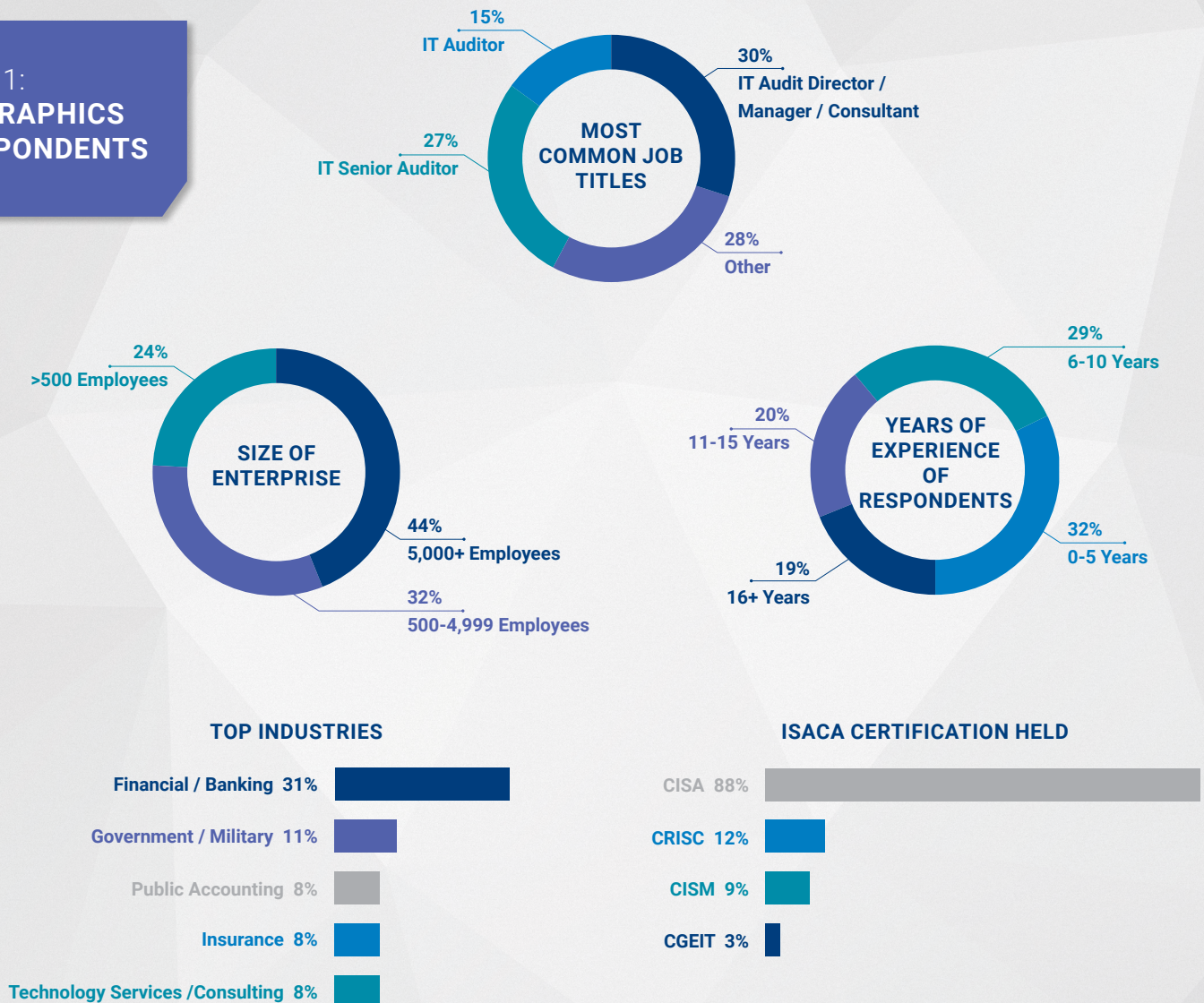▶ **IT audit leadership is tech savvy, but an executive-level technology skills gap exists.**

Based on the survey results, IT auditors are quite confident (30 percent) their IT audit leadership is tech savvy enough to keep abreast of technology changes affecting IT audit. They are much less confident of confident of executive leadership's ability (14 percent). Many auditors indicated that a technical skills gap has an impact on performing IT audits with a high degree of confidence. As a result, many are using cosourcing as a tool to supplement the technical expertise needed within the auditing function. Finally, IT auditors were most interested in learning more about predictive analytics and AI.

Survey Methodology

In August 2018, ISACA sent a survey to a global population of individuals that hold the Certified Information Systems Auditor® (CISA®) certification as well as ISACA members who listed audit in their job title. A total of 4,928 individuals completed the survey, of which 2,447 indicated their primary job responsibility was in audit. Those 2,447 respondents in audit roles are represented in this briefing. The demographics of the respondents are shown in **figure 1**.

Survey data were collected anonymously through Survey Monkey®. The margin of error in this research is +/- 2 points at a 99 percent confidence interval.

FIGURE 1:
DEMOGRAPHICS OF RESPONDENTS

MOST COMMON JOB TITLES

- 15% IT Auditor
- 30% IT Audit Director / Manager / Consultant
- 27% IT Senior Auditor
- 28% Other

SIZE OF ENTERPRISE

- 24% >500 Employees
- 44% 5,000+ Employees
- 32% 500-4,999 Employees

YEARS OF EXPERIENCE OF RESPONDENTS

- 29% 6-10 Years
- 20% 11-15 Years
- 32% 0-5 Years
- 19% 16+ Years

TOP INDUSTRIES

- Financial / Banking 31%
- Government / Military 11%
- Public Accounting 8%
- Insurance 8%
- Technology Services /Consulting 8%

ISACA CERTIFICATION HELD

- CISA 88%
- CRISC 12%
- CISM 9%
- CGEIT 3%

Among those surveyed, respondents hailed from 15 industries (**figure 2**) and all seven major global regions (**figure 3**).
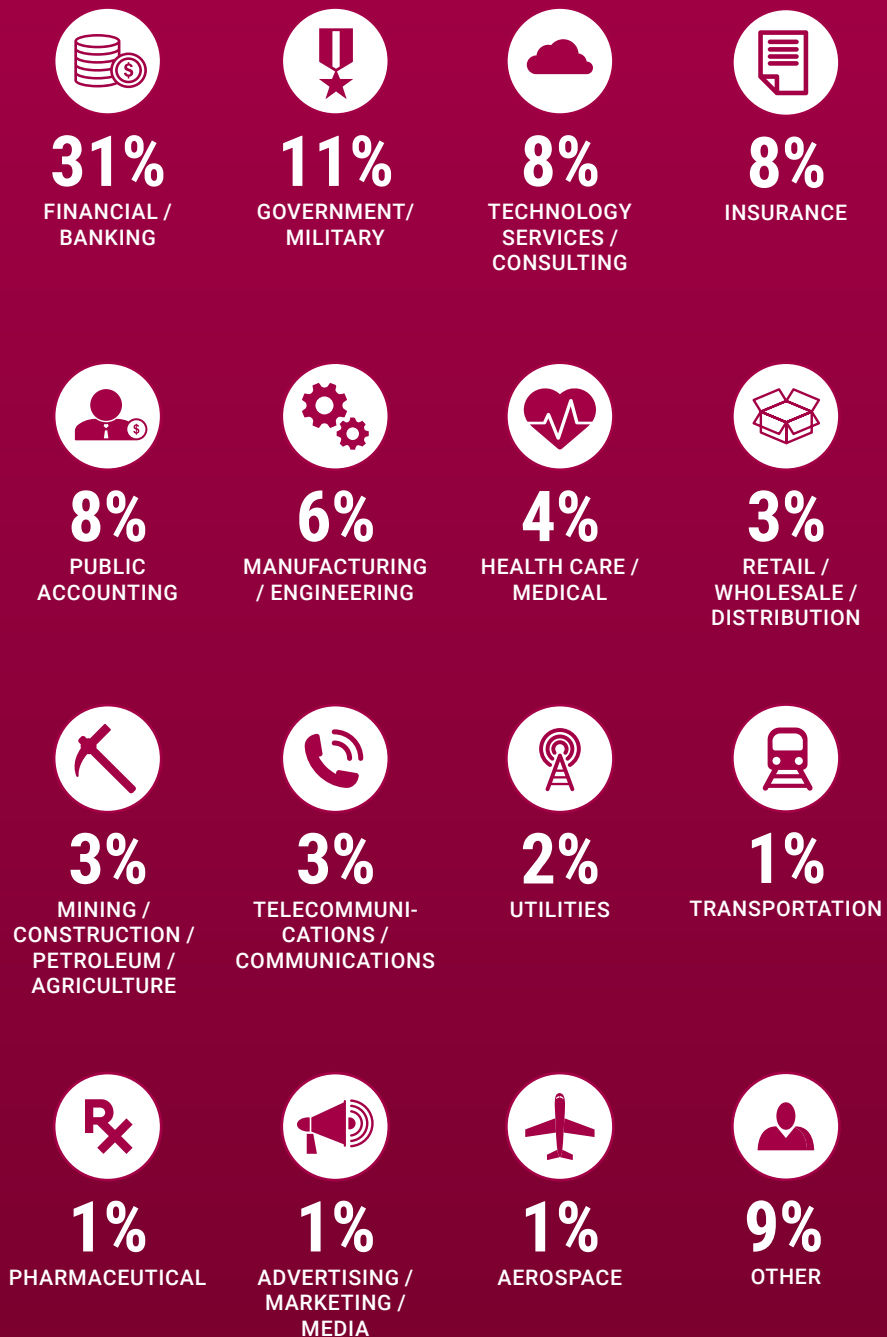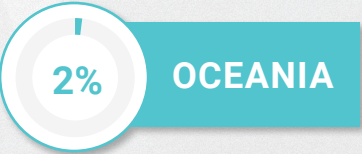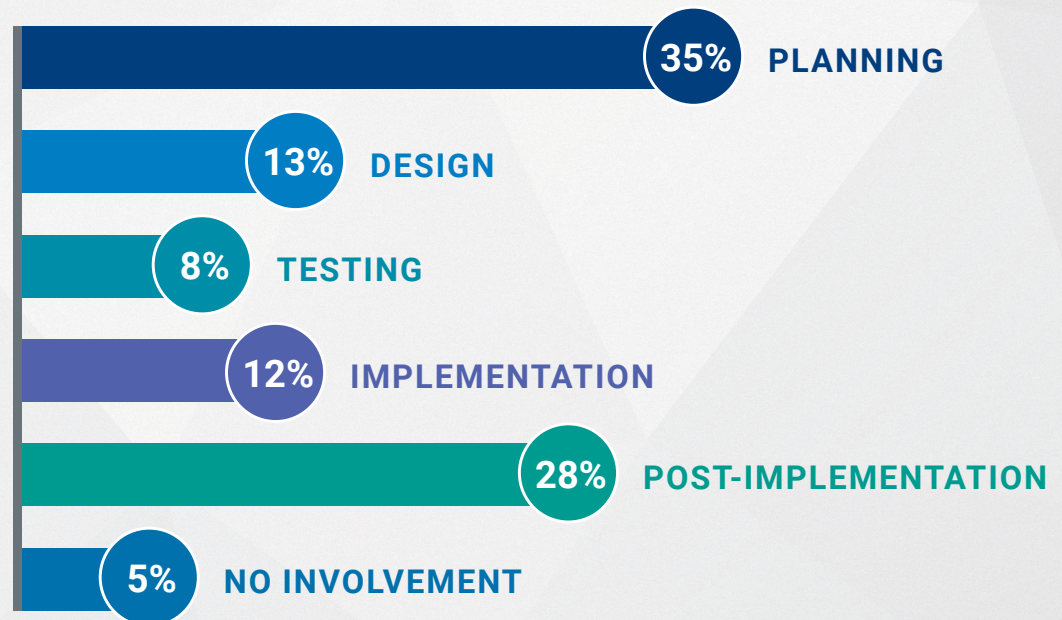
FIGURE 2:
INDUSTRY SECTORS

31%
FINANCIAL / BANKING

11%
GOVERNMENT/ MILITARY

8%
TECHNOLOGY SERVICES / CONSULTING

8%
INSURANCE

8%
PUBLIC ACCOUNTING

6%
MANUFACTURING / ENGINEERING

4%
HEALTH CARE / MEDICAL

3%
RETAIL / WHOLESALE / DISTRIBUTION

3%
MINING / CONSTRUCTION / PETROLEUM / AGRICULTURE

3%
TELECOMMUNI- CATIONS / COMMUNICATIONS

2%
UTILITIES

1%
TRANSPORTATION

1%
PHARMACEUTICAL

1%
ADVERTISING / MARKETING / MEDIA

1%
AEROSPACE

9%
OTHER

FIGURE 3:
REGIONS

40% NORTH AMERICA

13% EUROPE

22% ASIA

7% LATIN AMERICA

13% AFRICA

3% MIDDLE EAST

2% OCEANIA

Auditors Are Increasingly Involved in Enterprise Technology Projects

Auditors are increasingly becoming an integral part of or strong partners with their organizations' technology teams, with 82 percent of respondents indicating they are moderately or significantly involved in technology projects within their organizations. The answers vary significantly, however, on when IT audit is brought into technology projects, as indicated in **figure 4**. Only five percent of respondents indicated they were not involved in technology projects.

FIGURE 4:
WHEN DOES IT AUDIT TYPICALLY BECOME FIRST INVOLVED IN TECHNOLOGY PROJECTS

- 35% PLANNING
- 13% DESIGN
- 8% TESTING
- 12% IMPLEMENTATION
- 28% POST-IMPLEMENTATION
- 5% NO INVOLVEMENT

Auditors working in larger organizations (more than 15,000 employees and more than 30 audit staff) and technology consultants are significantly more likely to be involved in the planning stage than those in smaller organizations (less than 5,000 employees and less than four audit staff).

"The rate of change in the company's technology environment has led our internal audit team to proactively engage in certain technology projects earlier in the project life cycle. We leverage the company's IT governance mechanisms and our relationships with technology partners to identify projects that would benefit from early involvement, mostly focused on those with higher compliance or operational risk."

Krysten McCabe, CISA
Director, Internal Audit, The Home Depot

Auditors are even more positive about their level of involvement on significant technology projects in the coming years (**figure 5**). Nearly half (47 percent of respondents) felt IT auditors would become significantly more involved in technology projects in the next three to five years. Auditors new to the profession (less than one year of experience) are significantly more likely to see their role increasing (70 percent feel they will be significantly more involved in the future).

Only one percent of respondents reported IT auditors would be significantly less involved in technology projects in the next three to five years.
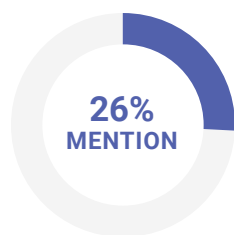
FIGURE 5:
CHANGE IN LEVEL OF INVOLVEMENT OF IT AUDIT IN THE NEXT THREE TO FIVE YEARS

3%
SOMEWHAT LESS INVOLVED

1%
SIGNIFICANTLY LESS INVOLVED

9%
NO CHANGE

47%
SIGNIFICANTLY MORE INVOLVED
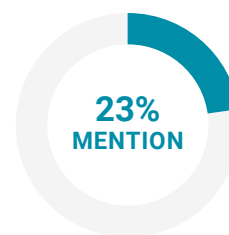
40%
SOMEWHAT MORE INVOLVED
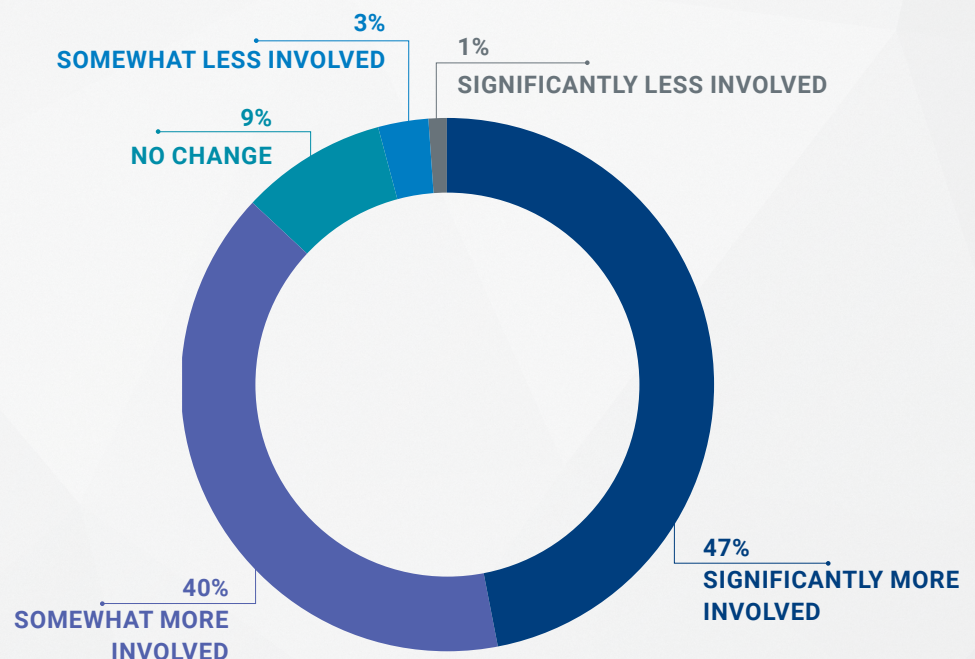
Auditors' Technical Skills Must Increase as Audit Automation Increases

New technology and automation are themes surfaced by the respondents. When presented a list of technologies currently in use or contemplated for use in the future, auditors indicated the following technologies are used now, versus likely to be used in the near- and long-term future:
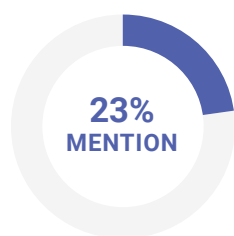
HAPPENING NOW

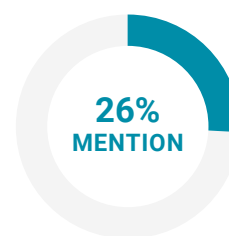**26% MENTION** — Business Process Modeling / Process Mining

23% MENTION — Predictive Analytics

WILL HAPPEN IN THE NEXT 1-2 YEARS

23% MENTION — Business Process Modeling / Process Mining

26% MENTION — Predictive Analytics

WILL HAPPEN IN THE NEXT 3-5 YEARS

25% MENTION — Artificial Intelligence

24% MENTION — Machine Learning

Of interest, while few respondents indicated that a particular technology would never be used within their organization, a large number indicated they did not know if—or could not predict whether—a technology would be used (e.g., 40 percent of respondents reported this for natural language generation). In short, there was quite of bit of uncertainty (or lack of willingness to guess) whether certain technologies might be used.

When presented a list of possible changes that may impact the IT audit profession, auditors indicated the challenges that are happening now, versus the challenges they thought would be likely to happen in the near- and long-term future:
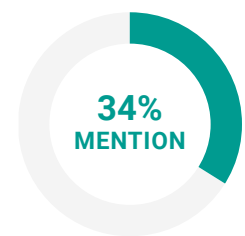
...there was quite of bit of uncertainty...on whether certain technologies might be used.

HAPPENING NOW
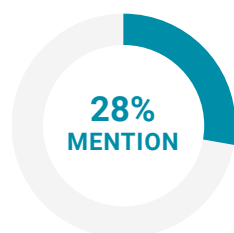
64% MENTION

Stronger demand for technical skills

46% MENTION
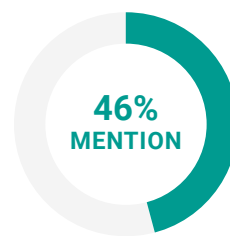
Increased expectation of skills and knowledge across broader subject areas *(i.e., becoming more of a generalist than a specialist)*
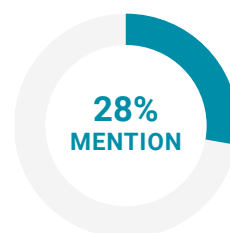
34% MENTION

Auditing becoming increasingly more automated

WILL HAPPEN IN THE NEXT 1-2 YEARS

28% MENTION

Increased need for data scientists on the IT audit team
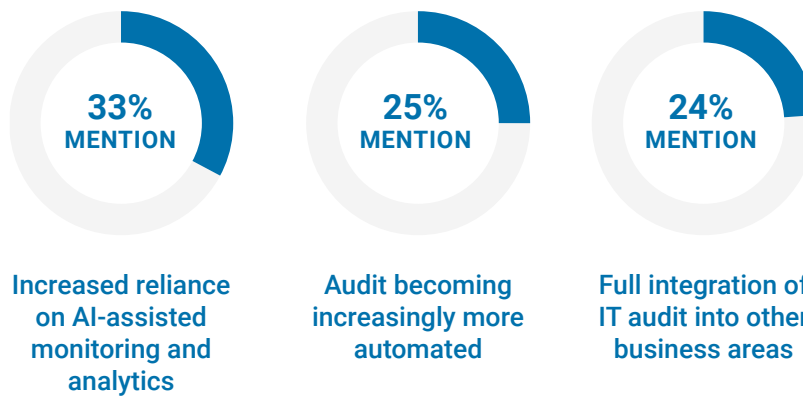
28% MENTION

Merging of services *(e.g., cybersecurity monitoring with ongoing assurance and assessment)*

26% MENTION
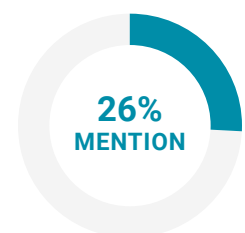
Flattening of audit organizations *(i.e., reduction in layers of supervision)*

WILL HAPPEN IN THE NEXT 3-5 YEARS

33%
MENTION

25%
MENTION

24%
MENTION

Increased reliance on AI-assisted monitoring and analytics

Audit becoming increasingly more automated

Full integration of IT audit into other business areas
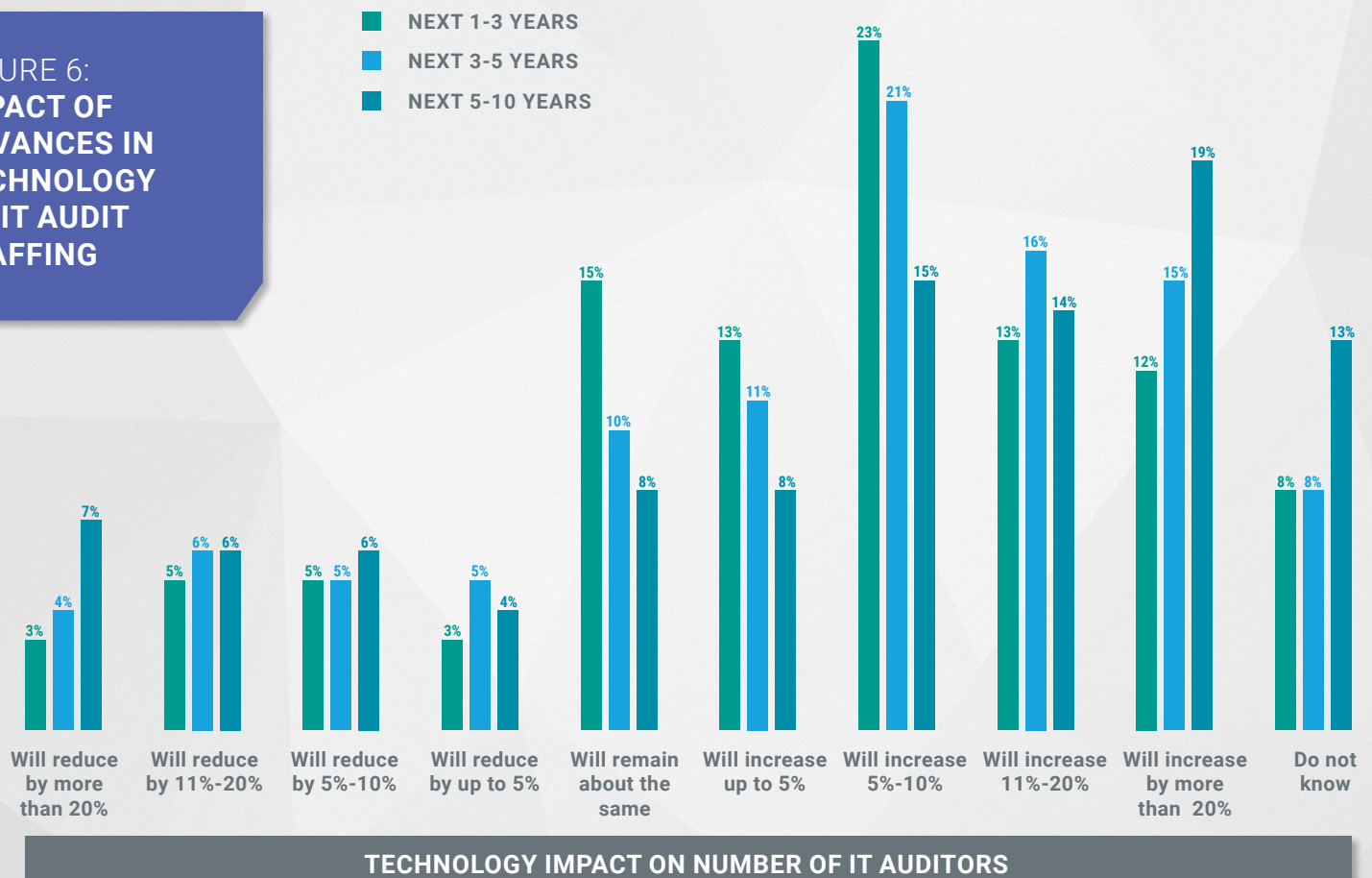
In addition to the findings above, respondents were also asked their opinions on whether certain changes to the profession would *never* happen. A sizable number (35 percent of respondents) indicated that there would never be a decrease in auditing staff needed for the foreseeable future. The flip side of this statistic is that 64 percent anticipate a decrease in auditing staff needed at some point in the coming years. Note that this question did not ask the causation of a potential staff increase or decrease. This response is interesting when compared to the responses, discussed below, concerning how advances in technology will impact IT audit staffing.

Technology's Impact on Staffing Size Is Unclear

Overall, auditors are optimistic (92 percent) when considering how emerging technologies will impact them professionally over the next five years. Of interest is the assumption by many that there may be a decrease in the size of the audit staff as noted in the preceding section. This is somewhat inconsistent with respondents' opinions on the impact technology may have on IT audit staffing levels in the next decade as noted in **figure 6**. More opined that technology would increase staffing levels rather than decrease staffing levels. The difference between the two inconsistent responses may be that individuals feel staffing decreases will result not as a consequence of technology, but rather due to other business factors.

FIGURE 6:
IMPACT OF ADVANCES IN TECHNOLOGY ON IT AUDIT STAFFING

Legend:
- NEXT 1-3 YEARS
- NEXT 3-5 YEARS
- NEXT 5-10 YEARS

Category	Next 1-3 Years	Next 3-5 Years	Next 5-10 Years
Will reduce by more than 20%	3%	4%	7%
Will reduce by 11%-20%	5%	6%	6%
Will reduce by 5%-10%	5%	5%	6%
Will reduce by up to 5%	3%	5%	4%
Will remain about the same	15%	10%	8%
Will increase up to 5%	13%	11%	8%
Will increase 5%-10%	23%	21%	15%
Will increase 11%-20%	13%	16%	14%
Will increase by more than 20%	12%	15%	19%
Do not know	8%	8%	13%

TECHNOLOGY IMPACT ON NUMBER OF IT AUDITORS

Optimism for the future of auditing carries over into predictions on future staffing sizes, with over 60 percent of respondents expecting to see the number of IT audit staff increase by varying degrees over the next one to five years. This optimism is contrary to some popular reports that auditing jobs will be eliminated by automation.[1] There have been numerous stories and reports that IT audit jobs will likely change, and the number of auditors needed may in fact increase, just as the survey results indicate.

[1] See, for example, Winick, Erin; "Every Study We Could Find on What Automation Will Do to Jobs, in One Chart," *MIT Technology Review*, 25 January 2018, https://www.technologyreview.com/s/610005/every-study-we-could-find-on-what-automation-will-do-to-jobs-in-one-chart/
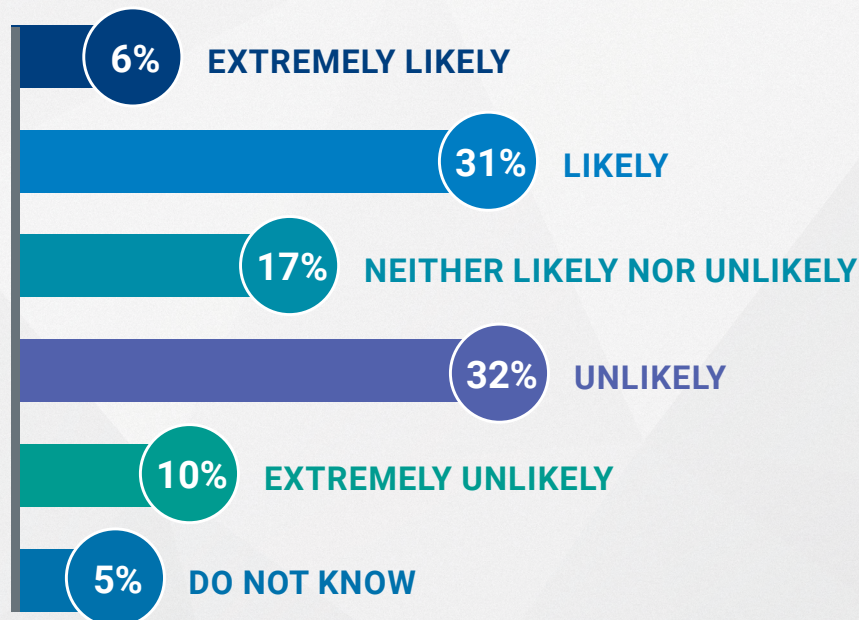
Automation and AI

Respondents (34 percent) indicate that auditing is increasingly more automated today, with the same percentage indicating there is an increased need for data scientists on the IT audit team. Another 14 percent of respondents noted that there is currently an increased reliance on AI-assisted monitoring and analytics.

...auditing is increasingly more automated today...

When we focus on AI, a divide emerges. Auditors are split on whether AI will replace all or some of the role of the IT auditors in the next three to five years, with 37 percent saying it is likely and 42 percent saying it is unlikely (**figure 7**). Those who indicate that AI will likely decrease the need for auditors in the next three to five years are also significantly more likely to say that AI is impacting auditors today. It is possible those who are currently dealing with the challenges of AI have better visibility into the possible repercussions on the size of auditing staff that AI will pose.

Those who currently see the impact of AI in their auditing roles (49 percent of respondents) are also more likely to say they always or frequently cosource staff from other departments (e.g., IT operations, business intelligence, data analytics, etc.) because of a lack of specific technical skills within the audit team. This is significantly higher than other groups.

FIGURE 7:
LIKELIHOOD OF AI REPLACING ROLE OF IT AUDITOR IN THE NEXT THREE TO FIVE YEARS

6% EXTREMELY LIKELY

31% LIKELY

17% NEITHER LIKELY NOR UNLIKELY

32% UNLIKELY

10% EXTREMELY UNLIKELY

5% DO NOT KNOW

Additionally, those who indicated AI is a current challenge are also significantly more likely to say it will negatively impact the number of future IT auditors, with 20 percent of respondents saying the profession will see a 20 percent decline in the next three to five years, and another 27 percent of respondents indicating a 20 percent decline in the next five to 10 years.

Those who are currently facing AI challenges are also more likely to have technical skills gaps that significantly (40 percent of respondents) impact their ability to perform IT audits with a high degree of confidence.

...20 percent of respondents saying the profession will see a 20 percent decline in the next three to five years...

IT Audit Leadership is Tech Savvy but Executive-Level Technology Skills Gap Exists

Not surprisingly, auditors are significantly more confident (30 percent) that their IT audit leadership team is tech savvy enough to keep abreast of technology changes affecting IT audit than they are of executive leaderships' ability to do the same (14 percent of respondents). When you add the 30 percent of respondents with a high confidence rating to the 54 percent of respondents with a moderate confidence rating for IT audit leaders keeping abreast of changes, this results in an 84 percent confidence level in IT audit leadership.

In addition, 77 percent of respondents reported their IT audit team has the technical skills and training to keep abreast of the technology changes affecting IT audit. However, this may be due to the use of cosourcing. Twenty-two percent of respondents say they always or frequently cosource staff from other departments because of a specific lack of technical skills within the audit team. As noted previously, cosourcing is significantly more likely to occur (reported by 49 percent of respondents) if the audit team is currently working with AI in their audit role.

When you add the 29 percent of respondents who indicated they sometimes cosource staff, just over half of respondents are using cosourcing as a tool to supplement the technical expertise needed within the auditing function. The use of cosourcing is also a likely result of organizations having difficulty recruiting auditors with the required technical skills (reported by 67 percent of respondents).[2]

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[2] ISACA and Protiviti, *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*, USA, 2018, http://www.isaca.org/Knowledge-Center/ Research/Documents/7th-Annual-IT-Audit-Benchmarking-Survey-ISACA-Protiviti-mis_eng_0418.pdf?regnum=

Technical Skills Gap

Many auditors indicated that a technical skills gap has significant (26 percent) or moderate (42 percent) impact on performing IT audits with a high degree of confidence. As previously mentioned, this concern is significantly higher among those who currently work with AI as part of the audit role (40 percent of respondents note significant impact on confidence).

Predictive analytics and AI are statistically tied as the most exciting technology of interest by respondents at 53 percent and 51 percent, respectively. Auditors are very interested in developing their auditing skills in these technologies via training or other professional development. Identifying potential data risk and problems (including
data security and integrity) was selected (by 87 percent of respondents) as the most nontechnical essential skill auditors need to develop if they want to successfully navigate the evolving profession in the next three to five years.

"IT auditors need to commit themselves to understanding organizational strategy and risks, and then figuring out how technology can enable them to complete testing and analytics to reduce these risks, in order to remain relevant. Rather than simply adopting new technologies and hoping for positive results, audit teams need to first understand the questions they are trying to answer, as understanding risk and strategy cannot be automated. Skills like the ability to identify data sources, write test scripts, analyze highly technical data and report the results succinctly to senior leaders will continue to be in demand."

Elizabeth Hays-Najlepszy, CISA, CISSP
IT Controls Manager at a major international manufacturing company

Training Budgets

Auditors are split on whether their leaders have appropriately funded training and professional development (43 percent indicate adequate funding, while 46 percent indicate inadequate funding). On a positive note, 30 percent of respondents expect to increase training budgets in 2019 and 52 percent of respondents report budgets will remain static. Only nine percent indicated that training budgets would decrease in 2019.

On a positive note, 30 percent of respondents expect to increase training budgets in 2019...

Conclusion

The role of the IT auditor is changing, and auditors need to adapt to both the technology changes and the cultural and organizational expectations required of them. It is incumbent that, to remain relevant, an IT auditor needs to seek the necessary technical training he or she needs, particularly on AI, predictive analytics, machine learning and other emerging technologies planned for use in the auditor's enterprise. Additionally, the IT auditor must actively participate in technology projects and become a trusted advisor to business stakeholders. This is crucial, as the auditor is expected to point out both the pitfalls and the opportunities of new technologies to add value to the enterprise.

Acknowledgments

About ISACA

Now in its 50ᵗʰ anniversary year, ISACA® (www.isaca.org) is a global association helping individuals and enterprises achieve the positive potential of technology. Today's world is powered by information and technology, and ISACA equips professionals with the knowledge, credentials, education and community to advance their careers and transform their organizations. ISACA leverages the expertise of its 460,000 engaged professionals— including its 140,000 members—in information and cybersecurity, governance, assurance, risk and innovation, as well as its enterprise performance subsidiary, CMMI® Institute, to help advance innovation through technology. ISACA has a presence in more than 188 countries, including more than 220 chapters worldwide and offices in both the United States and China.

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