2018 State of the Internal Audit Profession Study

Moving at the speed of innovation
The foundational tools and talents
of technology-enabled Internal Audit

pwc

Would you say your internal audit function is innovative? Does your organization have the talent and tools to deal with the risks arising from emerging technologies? And how will you attract the next generation of talent?

Technology advancement is fueling innovation in every industry: Machine learning is leading to self-driving cars and smart medical devices. The Internet of Things—paired with predictive analytics—is advancing the preventive maintenance of energy grids and industrial equipment. Blockchain is reinventing financial transactions and consumer product traceability. Drones are taking on roles from delivering packages to performing physical inventories, to saving lives. And the cloud, big data, analytics, and bots are making business processes more efficient, more agile, and more insight driven. As the technologies mature and as barriers to entry fall, organizations across industries are immersing themselves in innovation made possible by new technologies. But with emerging technologies come evolving risk profiles, and CEOs are all too aware of that. PwC's 21st Global CEO Survey finds that the speed of technological change is a top concern among CEOs. And risk professionals must help their organizations make sure that processes and controls are effective while not slowing innovation's pace.

Internal audit functions are expected to proactively contribute to responsible innovation. They must be able to quickly assess the full impact of technological advances and then pivot with each new innovation to fully understand how that innovation is acting to change the organization's risk profile. Boards want internal audit functions to have a perspective on the risks that new technologies bring and on the controls in place to appropriately manage those new risks. They want Internal Audit to provide advice on how their organization should exploit new technologies and to make recommendations as part of the audit process that push the organization's technological innovation levels.

Internal audit functions can serve in this valuable capacity only if they themselves are innovating. How can the function audit the controls around new technology implementations and technology-driven processes without acquiring new technology skill sets, taking new audit approaches and using innovative technologies for extracting data, testing and reporting? How can Internal Audit cast a wider lens over risks without building the department's efficiency through collaboration tools, analytics, and other technologies? Innovation-driven organizations need innovation-driven internal audit functions, or Internal Audit's value will diminish.

By way of PwC's 2018 State of the Internal Audit Profession Study, we sought to understand how internal audit functions are building a technology- and talent-enabled foundation to support their organizations' innovation strategies. More than 2,500 board members, senior executives, and audit professionals in 92 countries weighed in on Internal Audit's technology use and the value the function is delivering. We supplemented the survey with more than 50 executive interviews so as to gain an even deeper understanding of the specific approaches and best practices that help internal audit functions innovate. We learned that the internal audit functions that are most advanced in their technology journeys are evolving their technologies and talent models in lockstep. They are fusing those capabilities in order to create functions wherein technology-enabled talent is the norm—and it's paying off: three-fourths of internal audit functions using advanced technologies are contributing significant value, which is a far higher percentage than among those with less technology focus.

With the accelerating pace of technology-driven innovation, it's hard to know exactly how Internal Audit's capabilities will need to change in as little as five years. But one thing is clear: stakeholders will expect Internal Audit to keep up with the organization's needs. Internal Audit's innovation may have stalled because of poor data quality, lack of business technology, or other organizational roadblocks. But those challenges are quickly dissolving as CEOs pursue the opportunities inherent in powerful, new technologies. Wherever internal audit functions stand today, opportunities abound for them to evolve quickly, leveraging new skills, tools and methodologies. The discussion that follows explores (1) how internal audit functions are building a technology- and talent- enabled function for the future and (2) how they're including a well thought out strategy that all can apply to move forward. Every internal audit team is in the race. But speed and a technology- and talent-enabled strategy are required if teams are to keep pace.
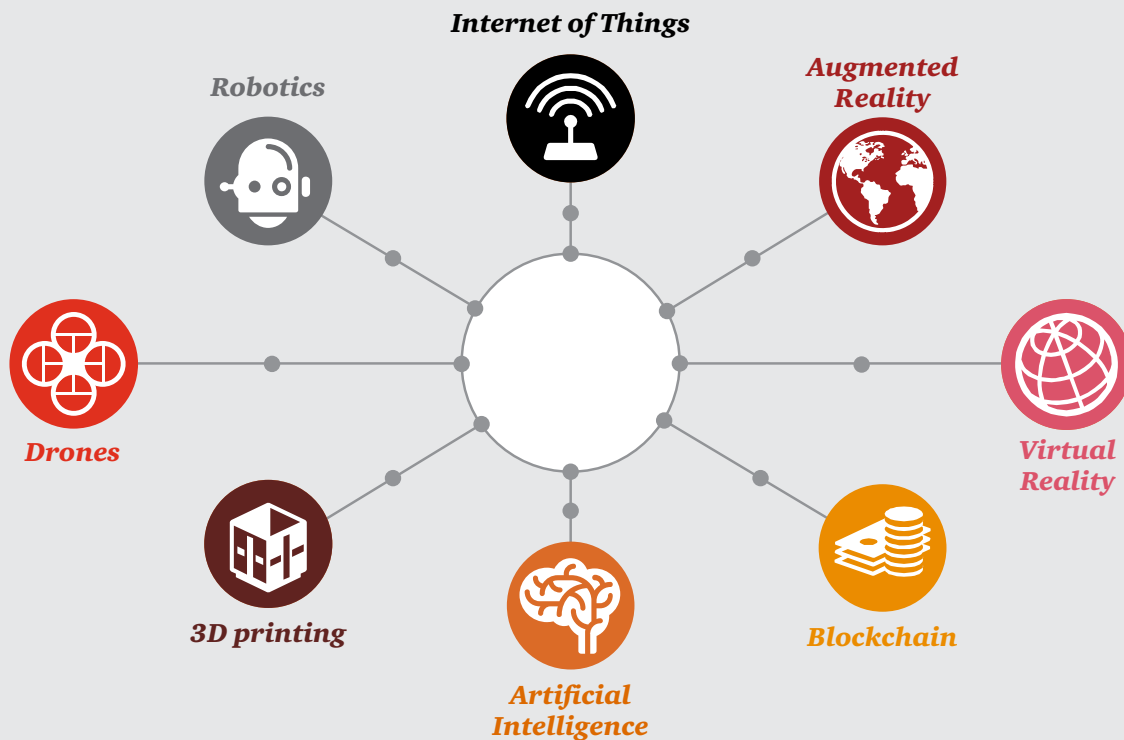
"Internal Audit leaders need to continuously ask themselves, 'Is our methodology agile enough to respond to emerging risks and technologies, and are we leveraging the appropriate tools and talent to deliver smarter results?'."

—*Mary McNiff,* Chief Auditor, Citigroup

Facing a technology inflection point

Source: PwC, "How can boards tackle the Essential Eight and other emerging technologies?", June 2017

Today Internal Audit may only have exposure to a limited number of technologies, such as enterprise resource planning (ERP), cloud, big data, and analytics. But the list of technologies Internal Audit must understand is growing fast. PwC identified the essential eight emerging technologies expected to soon have significant global impact (figure 1). And more are on the horizon. We are reaching a technology inflection point where powerful and accessible emerging technologies give organizations the opportunity to make leaps in productivity and market growth, while creating new products, services, and markets not yet imagined. Some of those new technologies, such as Blockchain, Machine Learning and Artificial Intelligence, are starting to support or replace certain decisions rather than just replace human effort the way earlier automation has. That factor introduces a new realm of opportunity—but also risks—and the need for different controls.

In reflecting the changes around it, Internal Audit soon simply won't be auditing the way it has in the past—by using today's skills. The technologies Internal Audit will have to understand, the risks it will have to cover, and the frequency of technological change it will have to address will make today's foundational tools obsolete. Moreover, more than half of internal audit leaders express concern that lack of technology adoption will result in diminishing value for their organization (56% agree). To play a valuable role in the organization, Internal Audit must enlist innovative tools, skills, and methods for providing assurance.

Figure 2a: Evolvers lead in tech sophistication and span industries, geographies and company sizes
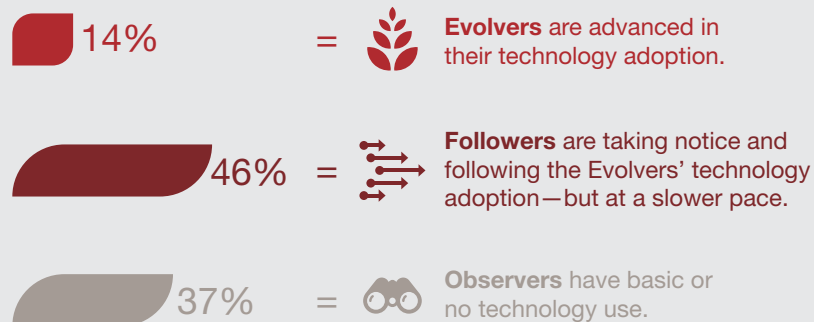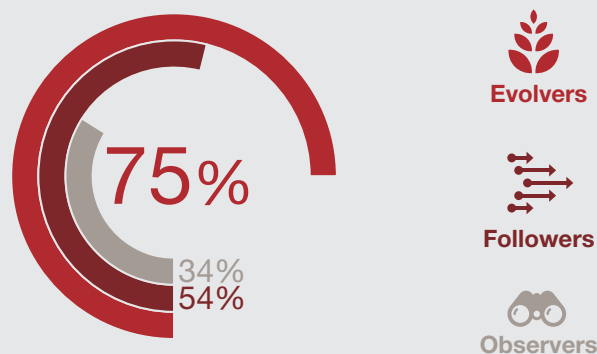
14% = **Evolvers** are advanced in their technology adoption.

46% = **Followers** are taking notice and following the Evolvers' technology adoption—but at a slower pace.

37% = **Observers** have basic or no technology use.

Figure 2b: Percentage of organizations who view the IA function as providing significant value

75%

34%

54%

Evolvers

Followers

Observers

*Survey results may not always equal 100% due to participant non-response.
Source: PwC, 2018 State of the Internal Audit Profession Study, March 2018.
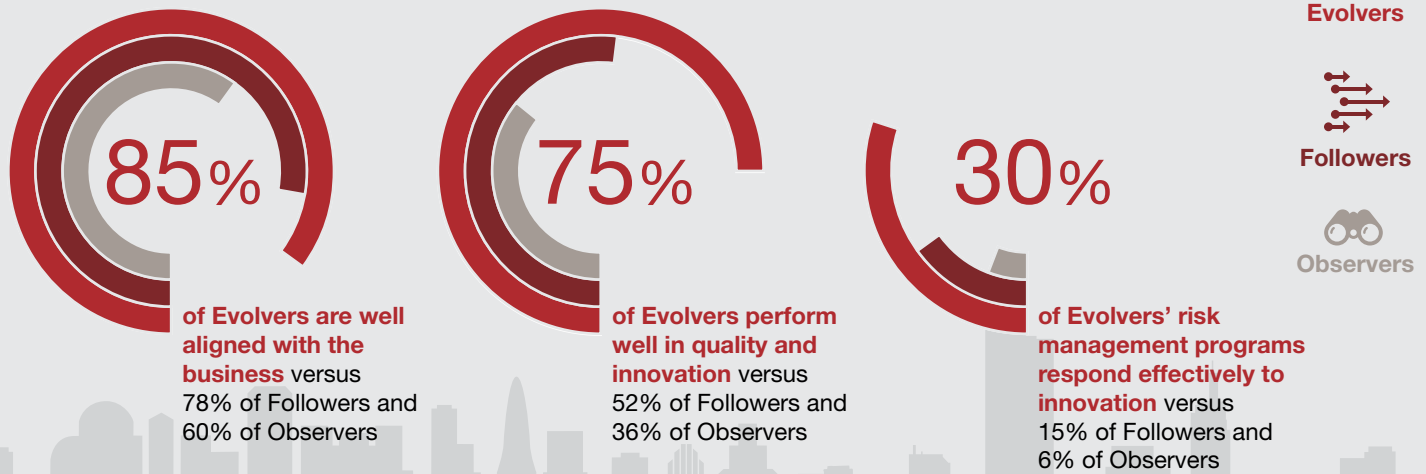
Is Internal Audit equipped?

Some internal audit functions are leaning right into this technology-driven future. They're already advising in areas such as risks and controls over robotic process automation (RPA), the application of Artificial Intelligence (AI) in their organization and the oversight of drone usage. They're using collaboration tools to increase their levels of organizational alignment and efficiency, data extraction tools and RPA to improve the expediency and coverage of their audits, and analytics, AI and machine learning to offer innovative and value-added insights to the organization.

Our study found that 14% of internal audit functions are advanced in their technology adoption, and we refer to that group as Evolvers (figure 2a). Surprisingly, Evolvers are found not only in large organizations or regulated industries. Evolvers span industries, company sizes, and geographies, which suggests that the stereotypical technology barriers of budget and size can be overcome.

Nearly half (46%) of internal audit functions are taking notice and following the Evolvers' technology adoption—but at a slower pace. We refer to them as Followers. Meanwhile, more than one-third (37%) of internal audit functions are still Observers when it comes to technology adoption. They may be constrained by lack of technology, be held back by poor quality of data within the business or have insufficient resources to invest; or the organization may simply not be ready culturally. That last group has only basic or even no technology use.

Figure 3: "Evolvers" see benefits from technology and talent enablement

85%
of Evolvers are well aligned with the business versus 78% of Followers and 60% of Observers

75%
of Evolvers perform well in quality and innovation versus 52% of Followers and 36% of Observers

30%
of Evolvers' risk management programs respond effectively to innovation versus 15% of Followers and 6% of Observers

Evolvers

Followers

Observers

Source: PwC, 2018 State of the Internal Audit Profession Study, March 2018.

Will it pay off?

The business case for being an Evolver is strong. Evolvers are rated as more valuable to an organization (figure 2b). 75% of them are contributing significant value versus 54% of Followers and 34% of Observers. Evolvers' solid foundation gives them the capacity to expand their risk coverage without equally expanding their resources. In addition, they're seen as more innovative in technology, more collaborative with other lines of defense, and better aligned with stakeholder expectations when it comes to their scope and audit plans. Those characteristics increase their relevance to the organization and its innovation agenda.

The percentage of Evolvers who report that their organizations' risk management programs respond to innovation very effectively is double the percentage of their peers. Evolvers' organizations are also more confident that their risk management programs can effectively manage the risks arising from automation, Artificial Intelligence, and other emerging technologies (figure 3).

"The real pitfall for Internal Audit is if they don't stay current on new technologies then they won't have a seat at the table and be perceived to be adding value; they need to stay current (not be experts) to stay relevant."

—*Alvin Bledsoe,* Audit Committee Chair, SunCoke Energy

The Evolver Difference

They move technology and talent in lockstep

Evolvers are pushing forward in lockstep on both technology and talent—and for good reason. Technology is changing Internal Audit's entire talent model. The availability of talent is driving technology decisions and vice versa. Different skills are required to bring new technologies into everyday operations. And college recruits with new skills may be needed—or incentive models and career paths may have to change to groom a pipeline of future leaders.

In some cases, technology could replace many rote tasks now performed by auditors, thereby creating both capacity and opportunity for today's internal audit departments to focus on higher risk areas that require human judgment. For instance, if bots could conduct or support compliance testing (such as Sarbanes–Oxley) done by auditors, resources could be redirected into expanded roles and responsibilities. Undoubtedly, technology and talent decisions need to be considered together.

> *"Everyone, including the CAE [chief audit executive], should have a working understanding of data visualization tools and how to apply resources most effectively."*
>
> —*Kathy St. Louis,* Vice President and General Auditor, Eli Lilly

The technology and talent shift

Disruptive technologies such as Blockchain and Artificial Intelligence require a fundamental shift in audit methodology. Even though the underlying complexity of Blockchain and the adaptive nature of AI can offer substantial benefits through operational disruption, the nature of how they work creates an environment where assurance must be derived as an inherent part of transaction processing. Moreover, the lack of standardization across both of these areas results in a gap of frameworks or guidance that can be consistently applied.

To adapt, internal audit departments must shift their underlying methodologies to more-ongoing, continuous, or real-time modes of audit. And their organizations must make significant investments in training, resources, tools and standardization. At PwC, we've made significant investments in both of those spaces—modes of audit and tools/training/resources. In the case of Blockchain, for example, we've developed a comprehensive software solution to the Blockchain audit problem, and we've put in place the only comprehensive risk-and-control framework in existence.

The right talent model can speed the value Internal Audit receives from technology, and Evolvers are fusing technology and talent decisions to do just that. They are advanced in their technology use and far outperforming their peers on talent: 72% of Evolvers excel at obtaining, training, and sourcing the talent they need versus 46% of Followers and 29% of Observers (figure 4). By contrast, a lack of skill sets is the top barrier preventing Observers from improving their use of technology. Similarly, better skill sets or better talent is seen as a top enabler whereby Internal Audit could improve its use of technology, and it ranked nearly 30 points higher than having a larger budget.

Figure 4: Evolvers excel at attracting talent
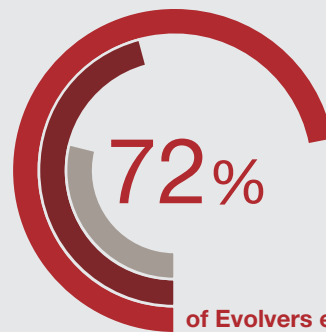
72%

of Evolvers excel at obtaining, training and sourcing the talent they need versus 46% of Followers and 29% of Observers

Evolvers

Followers

Observers

Source: PwC, 2018 State of the Internal Audit Profession Study, March 2018.

"There is no way to talk about a financial institution without considering technology. Therefore, the internal audit functions of these institutions must know technology and make intense use of it in their work. I believe that in the next five years, technology will make internal audit functions fast, relevant, and timely and offer greater coverage and lower costs."

—*Fabio Adriano Da Silva,* Internal Audit Manager, Banco do Brasil SA

Figure 5: Internal audit adoption of foundational tools

Tool	Using now	Will use within two years
Self-service data extraction from financial or operational systems	74%	94%
Work flow/dashboarding/reporting tools within internal audit	53%	85%
Work flow/dashboarding/reporting tools shared cross-functionally	33%	71%
Governance, risk management, and compliance technology tools	23%	62%
Analytics for advanced testing procedures	18%	38%
Analytics to identify risk and determine audit scope and planning	13%	30%
Analytic visualization	10%	27%

■ Using now
■ Will use within two years

Source: PwC, 2018 State of the Internal Audit Profession Study, March 2018.
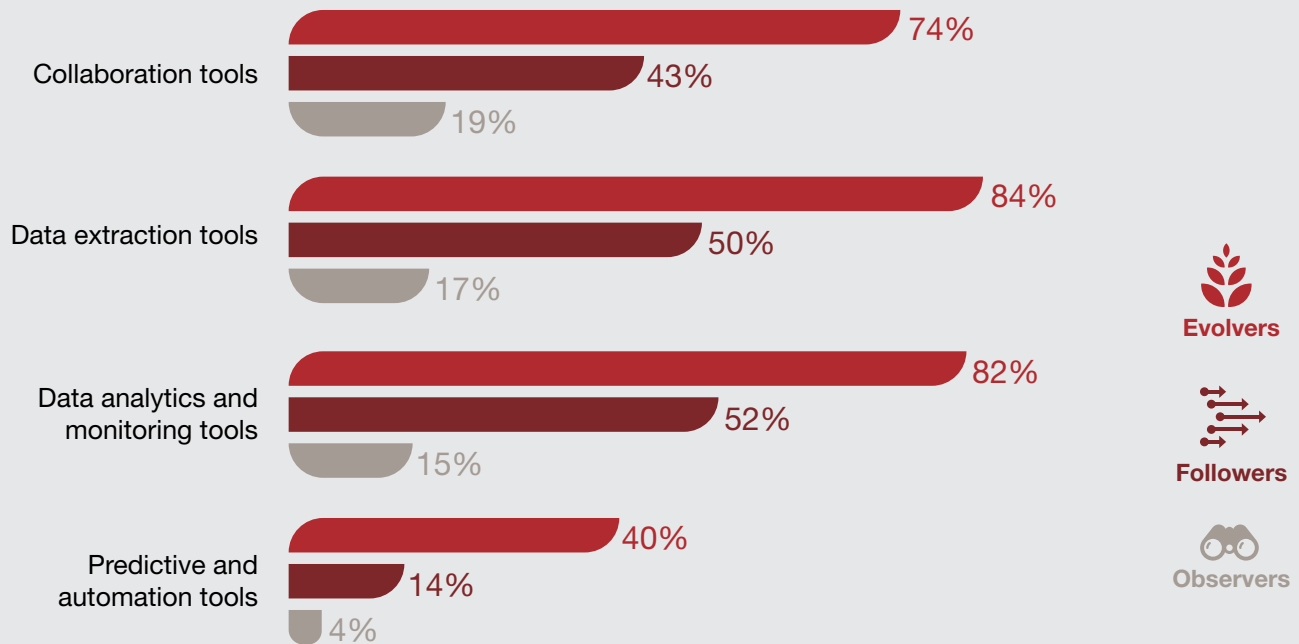
So, where are technology skills and tools most needed? As a foundation, collaboration, data extraction, analytics, and automation tangibly affect Internal Audit's processes and methodologies. An internal audit function designed from a blank sheet of paper would naturally put those tools in place to support (1) efficient file sharing, (2) risk assessment and audit planning, (3) sample testing, and (4) reporting and ongoing monitoring. We investigated the use of several tools within those four categories and found a natural adoption curve: greater use of long-standing tools and less use of more-advanced tools. Certain tools—from dashboards to self-service data extraction, to advanced analytics—may have been thought of as revolutionary in the recent past, but they're now considered foundational tools for internal audit functions that seek to resolve complex issues and maintain their value in a technology-driven future. Nevertheless, many internal audit functions have adoption rates of less than 50% today (figure 5).

Figure 6: Evolvers' tech maturity crosses tool categories

Percent that have at least intermediate maturity

Collaboration tools
- 74%
- 43%
- 19%

Data extraction tools
- 84%
- 50%
- 17%

Data analytics and monitoring tools
- 82%
- 52%
- 15%

Predictive and automation tools
- 40%
- 14%
- 4%

Evolvers

Followers

Observers

Source: PwC, 2018 State of the Internal Audit Profession Study, March 2018.

They build a deliberate strategy

Evolvers are advanced in all parts of internal audit's technology foundation (figure 6), and they're using a number of more sophisticated tools than their peers. However, they did not achieve that position by taking an ad hoc or tools-driven approach. They have embedded clear, multiyear talent and technology strategies into their internal audit strategic plans. In fact, an impressive, 85% of Evolvers focus on technology enablement as part of their strategic plans versus 61% of Followers and 38% of Observers.

Evolvers' strategies follow logical cadences. Evolvers begin with what Internal Audit is trying to achieve. The objectives they determine then drive decisions around what tools to use and where, and how talent has to change in concert with technology. Evolvers make sure their technology roadmaps are aligned with their organizations' technology roadmaps to take advantage of their broader organizations' efforts and investments. Through deliberate strategies, they are therefore delivering greater impact to their organizations and establishing foundations for agility as well as responsiveness to new technologies in the future.

Figure 7: Evolvers realize benefits from advanced collaboration tools

90%

of Evolvers using advanced collaboration tools perform well in cost optimization versus 74% of Followers and 64% of Observers

Evolvers

Followers

Observers
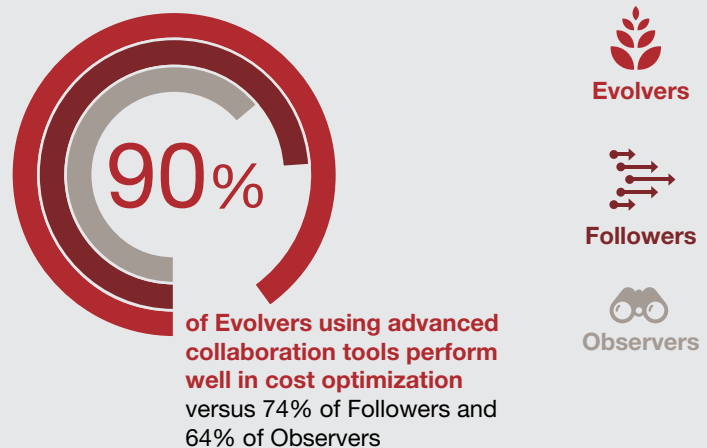
Source: PwC, 2018 State of the Internal Audit Profession Study, March 2018.

They technology-enable collaboration

Dashboards and work flow tools anchor and make possible a timely and efficient internal audit function. Such tools ease Internal Audit's work with those they are auditing or advising, and they simplify the sharing of information and the collaboration with risk functions. As collaboration tools mature and their costs decline, they can greatly aid in the audit process. A shared drive or intranet site between Internal Audit and the organization requesting audit support makes it easier for internal audit teams to work with their stakeholders. For instance, videoconferencing to collaborate across offices or continents increases efficiency, reduces travel costs, and can strengthen relationships. Adding screen sharing and collaborative working tools that enable teams in different places or the auditor and auditee to work collaboratively enhances that further. Using a work flow or audit tool to follow up on open audit items shows that Internal Audit is a willing collaborator within, and a partner to, the organization. So, not surprisingly, internal audit functions that are advanced in their use of collaboration tools stand out from their peers in managing stakeholder relationships and achieving cost efficiencies (figure 7).

"RPA and AI are the next big technologies. It will be important for Internal Audit to understand these technologies and be able to push the business in how they implement new solutions in the future. With new technology comes new security risk, and this should be a concern of boards going forward."

—*Alvin Bledsoe,* Audit Committee Chair, SunCoke Energy

They are self-service in data extraction

The ability to extract data directly from operational and financial systems and the use of such tools as governance, risk, and compliance (GRC) technology; optical character recognition; and security tools make Internal Audit not only self-sufficient but efficient in accessing the data it needs. More than 80% of Evolvers are self-sufficient in their data extraction. Showing stakeholders that Internal Audit is proficient in the company's systems demonstrates Internal Audit is invested in and committed to the organization.

A possible next step may be sending internal audit teams to company training on the ERP system. An understanding of how the ERP system works, coupled with the ability to obtain relevant data, can drive insights and increase the audit process's level of effectiveness. One company we interviewed told us Internal Audit is 100% self-service in data extraction because its group has

resources who are knowledgeable about its ERP and GRC systems. The company has now added to that capability by hiring a resource dedicated to Internal Audit who will be housed in the company's service center and serve as a full-time scripts data analysis expert.

As Internal Audit moves up the technology scale, optical character recognition tools/tools that can handle unstructured or semi structured data are other notable ways to apply technology and increase efficiencies. Repetitive testing efforts in, for example, the areas of invoices, inventory, and contract review can be reduced by using optical recognition tools and intelligent bots to populate testing worksheets. In our survey, those that are advanced in the use of data extraction tools are rated higher by their organization for the talent they possess. Nearly 70% of those advanced in data extraction rate high at obtaining, training, and sourcing the right talent versus just over one-third of those with only basic data extraction capabilities.

"On a broad scale, the technology/tools price tag is no longer a limitation to invest in future capabilities such as the computer and programming capacity for algorithms. There is no longer heavy investment needed to move into areas like RPA."

—*Rolf Spjelkavik,* Chief Audit Executive, Sandvik AB, Sweden

Figure 8: Evolvers are more advanced in analytics use
Percent of functions using analytics regularly

	Evolvers	Followers	Observers
Standard audit test procedures	61%	29%	15%
Advanced testing procedures	47%	18%	9%
Identification of risk to determine audit scope and planning	27%	13%	8%
Analytic visualization	29%	9%	6%
Specialized programs or analytics	28%	10%	4%

Source: PwC, 2018 State of the Internal Audit Profession Study, March 2018.

They are advancing data analytics and monitoring

Data analytics has been a topic of discussion among internal auditors for decades. But progress toward its adoption has been comparatively slow. As organizations cross the technology inflection point, internal auditors are becoming increasingly aware of the need to put analytics and data-driven decisions at the heart of operations. But to achieve that, many internal audit functions will have to pivot away from using analytics as additives to existing approaches and instead toward using analytics in a transformational way that fundamentally changes the nature of auditing. (See "Revolution not evolution: Breaking through internal audit analytics' arrested development.") And even though Evolvers are farther down that analytics path, even they have not truly integrated analytics into their entire audit life cycles (figure 8). The talent component of analytics adoption poses a roadblock for many: 44% of those needing technology skills point to data analytics as the technology skill requiring the most investment or improvement to meet future internal audit needs. (See ANZ case study for ideas on overcoming talent roadblocks.)

Evolvers are realizing direct value from their adoption of analytics. For instance, they rate high on focusing on critical risks that their companies are facing and on auditing of emerging-risk areas. Fueled by the value their current analytics are delivering, Evolvers are moving quickly into predictive analytics: 23% are currently experimenting with predictive risk indicators.

Building a tech savvy internal audit function at ANZ

The internal audit function of ANZ, one of the four largest banks in Australia, is pushing hard on its analytics use. As stakeholder expectations grow, Kevin Corbally, Group General Manager, Group Internal Audit, knows that his function will need to do more with less. He sees analytics as a critical capability to free capacity and expand Internal Audit's scope.

For ANZ Internal Audit the most challenging aspect in using technology is having resources with the necessary skills. Corbally thinks the function needs very tech savvy people in the future which will require changing their hiring process. For example, to test critical thinking skills - a high priority skill to ANZ - they may do more case study-based interviews. ANZ Internal Audit is training all of its full staff in technology use and data analytics and has updated its capability framework and development program to place greater emphasis on tech skills. The function is also sponsoring continuous education, including supporting members of the data analytics COE in pursuing Masters in Data Analytics degrees.

As the function builds its technology skills, Corbally expects ANZ Internal Audit to move into RPA. His team already provides controls advice to the many parts of the business implementing RPA and he sees how RPA could replace several routine tasks now consuming valuable internal audit resources. He looks forward to RPA helping Internal Audit "to get closer to continuous assurance and allow the internal audit professionals to apply their skills to root cause analysis."

By continuing to evolve its technology and talent foundation ANZ Internal Audit is maintaining its relevance and extending its capacity to meet ever expanding stakeholder expectations.

> *"Automation is not about decreasing head count; it is about moving up the value chain. By freeing up resources, auditors can shift time to proactive activities like business transformations and emerging risks, becoming problem solvers rather than problem finders."*
>
> —*Christine Katziff,* Corporate General Auditor, Bank of America

They are leaning into intelligent automation

Very few internal audit functions (just 12% of Evolvers) are rated as advanced in their use of this emerging group of technologies. But, the use of Robotic Process Automation is gaining momentum within Internal Audit, compliance and ERM (see "RPA in Action"). Given the significant productivity impact RPA is having in various business functions outside of risk management, PwC anticipates RPA will soon be a foundational tool for Internal Audit. While part of a longer time horizon, Internal Audit's routine use of rules-based intelligent automation decisioning is expected to evolve towards more use of artificial intelligence. As organizations embrace intelligent automation in products and services, Internal Audit will need to be knowledgeable about these technologies well in advance of applying them within the department.

Adopting automation and other tools within Internal Audit also positively impacts talent. It will make Internal Audit a much more attractive profession in the future and can create differentiation for organizations when competing for scarce skill sets and technology savvy resources. By fully or partially automating mundane tasks workers can be redirected to more challenging and rewarding assignments. Auditors will have highly sought after skills and Internal Audit will be an exciting place to work as teams stay informed of the evolving technology landscape. Internal Audit will be collectively equipped to deliver more value to the organization and auditors will be seen as significant contributors, which bodes well for the profession.

RPA in action: Where to automate Internal Audit?

RPA use is on the rise: 26% of survey respondents believe RPA will have significant impact on their organization within three years. And, while just 2% of internal audit functions report using RPA today, many more are already piloting and developing RPA use cases within Internal Audit. Nearly 20% of respondents expect to use the technology within two years.

RPA can help Internal Audit increase productivity, expand its risk coverage and help address the ongoing burden of doing more with less. With RPA tools having relatively low licensing costs and straightforward user interfaces, it's tempting to see RPA as a simplistic technology and unleash a flurry of bots against repetitive audit tasks. But before doing that it's best to pause and think about RPA in the context of a broader tools and talent strategy. What is Internal Audit trying to achieve and how can it best be realized? Is it best to automate a step of an existing process or redesign the process? If bots can automate steps, what could bots plus analytics and rules-based decisioning accomplish?

We typically find internal audit functions starting the RPA journey with the selection and build of a pilot. This allows the organization to onboard the technology, learn to use and work with digital labor, and demonstrate a successful bot build that can be championed through the organization. Concurrent with the pilot, we recommend starting on the automation roadmap. This helps answer the question of "what next" once the pilot is successful, and helps clients move effectively from the pilot phase into early scale.

The way to begin an automation roadmap is to conduct a process scan and opportunity assessment to identify processes and activities with the highest potential return on automation investment. Activities appropriate for RPA generally have certain characteristics. Good candidates are high volume, low complexity, highly standardized and rules-based. They access multiple, generally stable, software applications that are not integrated. They are particularly effective when a high level of quality is mandatory and decision criteria on exception handling is straightforward. Activities that fit this criteria are often in the bowels of processes, not the innovative edges. But the automation technology is ready today and through RPA implementation resources can be freed to take on more valuable activities.

Here's an example of a bot that automates a series of tasks within vendor controls testing. The bot downloads necessary forms from a sharepoint site, determines the information to generate from an ERP vendor change report, logs into the ERP system, generates the report and exports it to a spreadsheet, determines the appropriate sample size, selects a random sample from the report, finds corresponding approval forms and compares values, summarizes results on an output sheet and provides detailed information on exceptions. While this example may seem mundane, it's one of many areas where Internal Audit can save time to redirect elsewhere.

They are migrating from one-to-one to one-to-many skill sets

The pace and scale of technology innovation demand that Internal Audit no longer structure its team with individualized skill sets as it has in the past. The legacy approach requires too many individuals and is sure to be cost prohibitive. A technology understanding at a level well beyond basic IT general controls must be part of everyone's core skills. In that regard, nearly 80% of Chief Audit Executives (CAEs) say Internal Audit most needs to expand or improve its technology skills to meet its future needs. Internal Audit needs risk professionals who are technology curious and have mind-sets and abilities to routinely retool based on emerging technologies and changing enterprise risks. And even though such resources may seem scarce, most people actually fall into this category. According to a survey of more than 10,000 workers from a broad range of industries in PwC's Workforce of the Future study, three out of four people are ready to learn new skills or completely retrain so as to remain employable; the same number say it is their own individual responsibility to update their skills rather than to rely on employers.
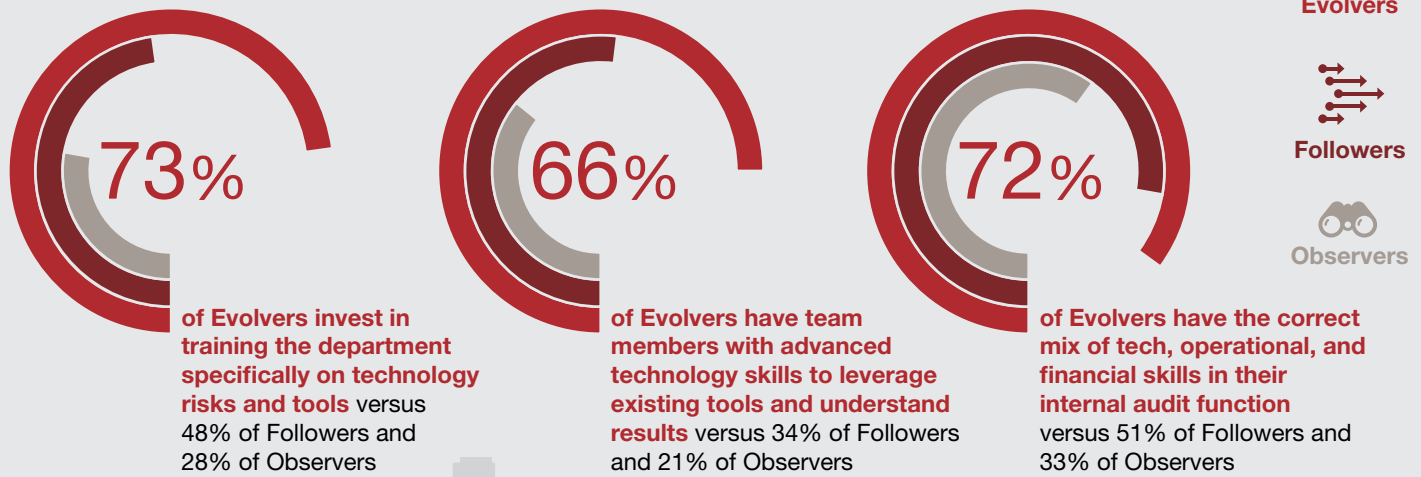
"Moving forward, my goal will be to hire tech-curious individuals from multiple backgrounds and with multiple skill sets. I will be looking for individuals who are creative and willing to try different approaches within the new tech paradigm but also are not afraid to fail a few times. The traditional experience that used to ensure a path to internal audit might not be enough—or needed at all."

—*Ninette Caruso,* Senior Vice President & Chief Audit Executive, Discover Financial Services

"Technology remains critical to Internal Audit in terms of futureproofing the profession. There is a strong emphasis on IT skills recruitment and a focus on delivering by using technology as the business matures into more process automation. Internal audit functions cannot expect junior resources to have the level of depth and breadth that organizations require from an IT perspective. CAEs should be recruiting data specialists and seasoned IT people preferably with some programming experience that can adequately capacitate and build the audit activity. The internal audit profession needs to focus on creating more holistic audit professionals with IT in mind."

—*Jenitha John,* Chief Audit Executive, FirstRand Group, South Africa

Figure 9: Evolvers excel in talent enablement

Evolvers

Followers

Observers

73% of Evolvers invest in training the department specifically on technology risks and tools versus 48% of Followers and 28% of Observers

66% of Evolvers have team members with advanced technology skills to leverage existing tools and understand results versus 34% of Followers and 21% of Observers

72% of Evolvers have the correct mix of tech, operational, and financial skills in their internal audit function versus 51% of Followers and 33% of Observers

Source: PwC, 2018 State of the Internal Audit Profession Study, March 2018.

Evolvers' ability to tackle talent and technology in lockstep is a clear point of differentiation. Evolvers are more often investing in technology-risks training and tools training than their peers are. They more often have team members with advanced technology skills on their teams and more often say they have the correct mix of tech, operational, and financials skills versus their peers (figure 9).

"The more we challenge ourselves in technology, the more it keeps people excited. Even if we are still doing the core of what we've always done, we are doing it in different ways. That's the only way we will continue to move forward."

—*Katie Scalia,* Senior Vice President Global Head of Audit, News Corp.

Evolutionary or revolutionary?
Leap forward when possible

Figure 10: Today's future is tomorrow's foundation
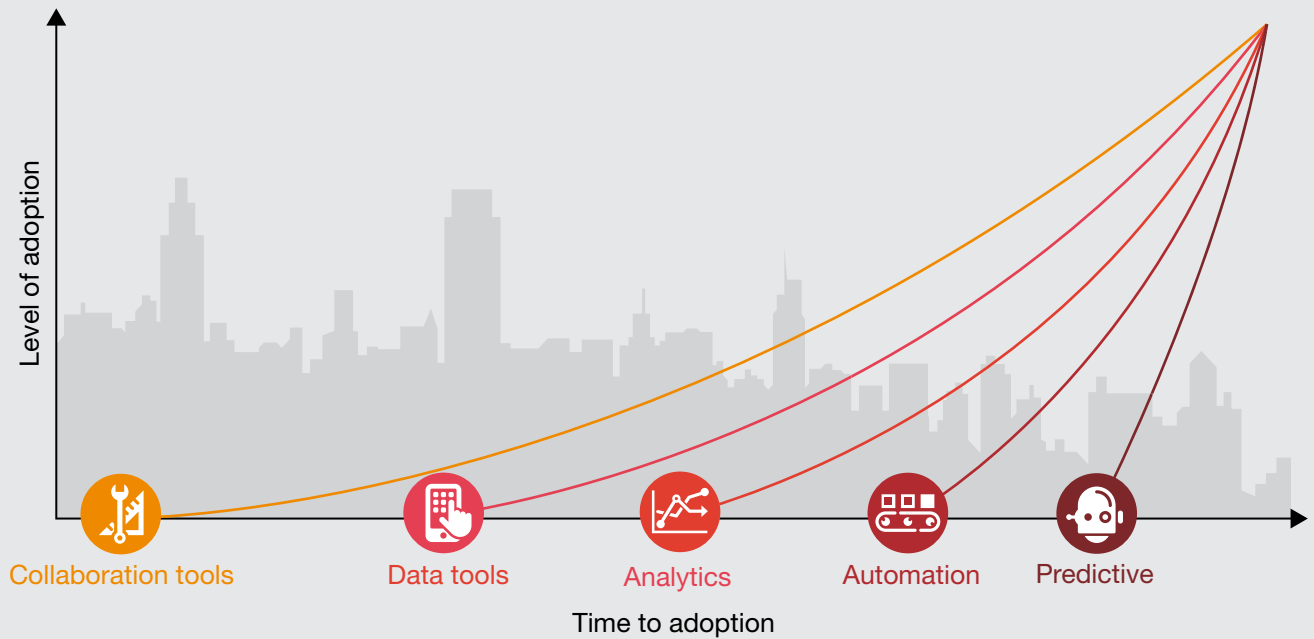
Source: PwC.

Regardless of industry, department size, or budget, Internal Audit can and must advance in building its technology and talent foundation. Technology is central to an internal audit function with the required speed, capacity, and capability to advise on technology-related risks, to pivot as the organization's innovations demand, and to audit technology-based operations. Consistent with the general pace of technology adoption, the time from when a tool is revolutionary to the time it has become foundational is shrinking; and the rate of new-tool introduction is accelerating (figure 10). The acceleration of adoption means that:

- Barriers to adoption—such as cost and availability of experienced resources—are now lower for foundational tools, which makes those tools easier to put in place.

- Going forward, the pace at which Internal Audit moves in adopting new tools has to be faster if the department wants to keep pace with its organization's use of technology.

2018 Artificial Intelligence predictions

Artificial Intelligence is complex and advancing quickly. It's hard to know how the technology will change business and society in the coming years, but nascent trends have led PwC's AI and functional specialists to make specific predictions about AI for the next 12 months. (See 2018 AI Predictions: 8 insights to shape business strategy.) Contrary to popular reports, PwC predicts that across 29 countries analyzed, the share of jobs with potentially high risk of automation will be only 3% by 2020. Rather, the value of AI lies in empowering current employees to add more value to existing enterprises in three main ways.

- By automating processes too complex for older technologies
- By identifying trends in historical data to create business value
- By providing forward-looking intelligence to strengthen human decisions

Consider, for example, an AI system that scans all of the function's data, identifying trends and anomalies, performing many transactions automatically, and flagging relevant issues for further attention. Imagine AI's also identifying and explaining likely risks and offering data-driven forecasts to support managers' analysis and decisions. That kind of practical AI is ready right now.

AI-savvy employees won't need to know only how to choose the right algorithm and feed data into an AI model. They'll also need to master how to interpret the results. They'll have to know when to let the algorithm decide and when to step in themselves. Effective use of AI will also demand collaborations between different teams to solve a problem.

Some forward-thinking organizations are already starting the massive workforce upskilling that AI and other digital technologies require. Such upskilling won't only teach new skills; it will also teach a new mind-set that emphasizes collaboration with coworkers—and with AI.
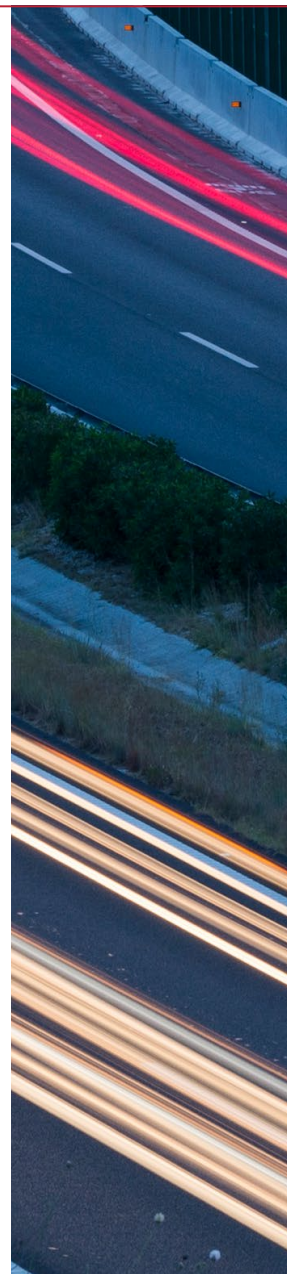
"Technology is very important. We have to be performing at the same level as the company to keep up with the speed at which the company is using its own data, or else the insight we have and our impact will get lost. And we have way too much to offer as a profession to let that happen."

—*Katie Scalia,* Senior Vice President Global Head of Audit, News Corp.

Internal Audit doesn't have to master predictive or intelligent automation tools by tomorrow. However, it does have to build technology and talent investment strategies and roadmaps that push the boundaries beyond evolution and into revolution. Just as we as consumers skip generations of technology to access the latest functionality or as we use technology to solve problems in new ways, an internal audit function can make significant progress in its technology and talent journey when it thinks about how to solve problems differently rather than move forward in small, evolutionary steps.

Consider an internal audit function that seeks to boost its efficiency by advancing its data extraction capability. The evolutionary approach would be to invest in training an employee on the company's ERP tool so that that employee can more quickly and efficiently extract data through self-service. The revolutionary approach might be to build a bot to do it. Or, what if a bot could extract data and place it into an audit work paper tool to jump-start the testing process?

Focusing on the problem Internal Audit is trying to solve and how best to do so helps the function leap forward in revolutionary ways. Does Internal Audit need to train staff? Could it automate the task instead? Could it call on a technology-enabled Center of Excellence (COEs) to assist? If Internal Audit chooses one of the latter options, how would it reassign its freed capacity so it could deal with more-complex and more-challenging risks?

A deliberate strategy that lays out Internal Audit's goals and the integrated technology and talent steps to achieve them will keep the function moving forward into a technology-driven future. (see Centrica case study.)

A strong foundation helps Centrica Internal Audit extend its technology and talent reach

For three years, Centrica's internal audit function has been developing its data analytics capability. Its goals are twofold: to drive better insight into the operating effectiveness of controls over critical risks and to provide empirical evidence to management that goes deeper than traditional evidence. Carolyn Clarke, Head of Audit, Risk and Control at the United Kingdom–headquartered energy company believes there is more to achieve, but, to date the results have been encouraging. The function now uses data techniques in over half of its audits and is becoming a center of excellence for information and data for the wider business.

Audit is able to provide positive assurance to business stakeholders by testing whole data sets, and can more easily identify outliers and trends in data. It also has a greater capacity to model ranges of outcomes and sensitivities in a way that would not have been possible without the technology. For example, a recent audit looked at why a business unit was not performing as planned. Management had identified several areas where information was not adequate. Using analytics tools, the auditor determined the full breadth of risk exposure to the unit's operations in a way that the business had been unable to do. The results provided management with the information it needed to assess risk exposure and determine actions.

Not surprisingly, feedback from the business, the board, and executive management has been positive. But the journey has not been without difficulties. Building up momentum and credibility both within the audit team and the wider business has taken time, says Clarke. Positive feedback from the business has provided the audit team with confidence that the technology can deliver results.
In addition, she recruited three data specialists who are now an integral part of the team. "They approach problems in a different way and present options for testing hypotheses based on their deep knowledge of the subject," she says, "which would not have happened if we had given the role to a traditional auditor."

Recently Internal Audit has been helping the organization strengthen its second-line-of-defense capabilities. For example, the audit team is advising on the development of a continuous-monitoring analytics process within a new dashboard that the human resources team created to manage its own first-line activities. "By devising automated second-line capabilities, you avoid the need to have a separate team within that part of the organization looking at the controls," Clarke says.

Over the next 12 months, Clarke intends to link the business's governance, risk, and assurance processes, which are handled by separate IT tools currently. With tablets that are linked to both audit's own software and the business units' IT tools, senior auditors will be able to enter observations directly into the system while out in the business, create actions that are structured around risks and give the business direct, real-time visibility to the process. "Our audit directors and managers know the business, know what good looks like, and can add real value in real time by bringing their insight and experience to bear," Clarke adds.

The push toward new tools and skill sets will continue to challenge the internal audit function altering both its culture and composition. But Clarke is convinced that focusing on insight and agility will enable the business to improve its results.

"You don't hire a tool set; you hire a mind-set."

—*Ninette Caruso,* SVP and Chief Audit Executive, Discover Financial Services

Internal Audit can have the best strategy, but it can't execute without the right skills. Talent is a key variable in taking revolutionary rather than evolutionary steps. One way for internal audit functions to leap forward is to think differently about sourcing from both inside and outside the organization. Evolvers are overcoming both talent and budget barriers by working with compliance, enterprise risk management, and business units to share resources and technology investments. (See Eli Lilly case study.) In fact, 82% of Evolvers collaborate with other lines of defense to align technology tools' uses and functions versus 61% of Followers and 45% of Observers.

Centers of Excellence represent another emerging model for leaping forward. Through a COE, Internal Audit can tap technology and individuals with specialized skills and deliver value far beyond labor arbitrage. A COE could be dedicated to Internal Audit or be a centralized, shared-services organization tapped by multiple risk or broader organizational functions. Examples of tasks easily performed by COEs are the extraction of data and the running of reports, the creation of reports that tie data together across multiple systems, the performance of analytics and the writing of scripts, and the definition of rules-based exception

reporting or dashboarding. A COE could be staffed with either internal resources or third-party resources via a sourcing arrangement—or some combination. In other successful examples, a third party has helped Internal Audit leap forward in such areas as analytics by establishing the technology, by training an internal COE team, and by then handing operations back to the organization.

Co-sourcing can help an internal audit function leap forward if it hasn't put in place the recruiting and talent development programs it needs. In fact, co-sourcing is a strategy equally preferred by Evolvers, Followers, and Observers; and it's the top method internal audit functions say they plan to use to source technology talent in the future. Overall, 63% of respondents report they will co-source to secure the technology and talent they need. However, it is incumbent on executives to make sure they're doing smart co-sourcing in order to get the revolutionary impact they seek. That means thinking about technology and talent in lockstep and sourcing technology-enabled talent. CAEs should expect third parties to bring tools and managed technology solutions that provide tangible value and should expect resources to apply critical-thinking skills and an analytics mind-set to everything they do.

Every member of the internal audit team needs some level of technology expertise—and, most likely, new skills such as design thinking, creative thinking, or knowing how to turn data into insights. So, in addition to thinking about sourcing strategies, CAEs need a leave-no-one-behind strategy to reskill auditors. That starts with an assessment of digital skills and could then put in place training programs, rotation programs, team competitions, and other educational opportunities. For example, one Audit Committee Chair recommended auditors attend the Consumer Electronics Show in Las Vegas every year to learn about new technologies on the horizon. A CAE advocated that companies within an industry collaborate to build auditor expertise in a specific area such as Blockchain's application in the financial services sector. Another is sending resources to college-accredited classes on cybersecurity. And another is recruiting operational auditors with Structured Query Language (SQL) experience and data scientists to form a COE. As those examples show, revolutionary thinking in the area of talent development lays the groundwork to leap forward with a technology-driven future.

Cross-functional collaboration helps Eli Lilly make big data strides

Eli Lilly's internal audit function began its digital journey many years ago. Now, because of a collaborative cross-functional effort that will include the build of a shared data warehouse, the company's internal audit function is working to make a significant leap forward in 2018.

While business functions within Eli Lilly, such as Compliance and Ethics, Finance, and Internal Audit, are separate organizational units, they have often collaborated on activities such as risk assessment and issues management. In the area of data analytics, Internal Audit has combined its data acquisition capabilities with the Compliance and Ethics team's ability to find meaningful business insights in the data. Working together via a shared data warehouse was a natural outgrowth of that collaborative relationship.

The path forward took shape in 2017 when an internal auditor proposed that the function could achieve its data-driven objectives more quickly with a refreshed strategy, as opposed to part-time and more incremental approaches. He proposed that Internal Audit work with other functions to define shared data needs and jointly obtain funding for a data warehouse that would serve their combined objectives. The idea was well received, helped by the realization that the broader organization's data analytics initiatives would benefit from the effort. Ultimately IT committed to enabling the effort and the formal collaboration began.

With data more readily available to support the needs of the function, Kathy St. Louis, CAE is targeting three phases of auditing: risk assessment, planning and execution. St. Louis believes that internal audit can now make great strides in complementing the company's risk assessment process with tailored analytics, and improve the overall efficiency and effectiveness of audit planning and execution. The department ultimately plans to progress to identifying analytics that can be used as leading risk indicators for the business.

As Eli Lilly's internal audit function ramps up its digital capabilities, St. Louis' goal is that the entire team will have a working understanding of data visualization tools and how to apply resources most effectively. Technology will drive a new baseline talent requirement that resources have technology-enabled critical thinking abilities, and the capability to continuously learn new skills. And, recognizing the importance of new ways of thinking, St. Louis will augment her team with external hires and co-sourcing relationships to bring a mix of perspectives and skills to the team.

Matching the speed of innovation

Innovation is changing the future daily—and bringing with it an expansive array of risks and opportunities. That's why Internal Audit functions must not only fully understand innovation's impact on their organizations' risk profiles but also fully embrace that impact themselves. By accelerating an existing technology and talent strategy or building a more revolutionary plan of attack, all internal audit functions will equip themselves to address the technology- and innovation-related risks hurtling toward them. That readiness will continue to increase Internal Audit's relevance and reinforce the function's role as a trusted advisor.

> *"With the pace of innovation, it's challenging to stay ahead of risks. But risks you aren't thinking about today will become tomorrow's issues. It's critical that Internal Audit is equipped with the skills and technology to look ahead at an expanding set of potential risks and to communicate effectively with the Audit Committee on the impact."*
>
> —*Jeb Bachman,* Audit Committee Chair, The Children's Place

Actions to take today

Assess where Internal Audit stands with its tech-enabled foundation.

- Is your organization using or does it plan to use any emerging technologies such as Blockchain, AI, or robotics?
- Does your internal audit function have access to the skills needed to provide risk and controls advice with regard to those emerging technologies?
- Is your internal audit function taking advantage of collaboration, data extraction, analytics, and visualization tools?
- Does your internal audit function have a technology skills and tools roadmap as part of its strategic plan?

Fuse technology and talent into a single strategy.

- Let the objectives you are trying to accomplish direct the company's technology and talent investments.
- Invest smartly today for tomorrow's needs.
- Assess the digital skills available to Internal Audit.
- Develop and source the technology skills needed for tomorrow.

Innovate and be revolutionary whenever possible.

- Rethink how things could be done versus making incremental improvements.
- Find ways to share or leverage others' technologies and talents to leap forward.
- Remember that today's issue is not tomorrow's; engage with the organization's innovation agenda to ensure that Internal Audit keeps pace.

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