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A growing trend towards the application of artificial intelligence in auditing is enabling auditors to automate tasks that have been conducted manually for years. James Kelly finds out how cognitive technology is evolving the audit process and how CPAs can take advantage

Illustrations by Gianfranco Bonadies

8 March 2016 may go down in the annuals of accounting history as the day auditing beginning to change forever. On that day two of the Big Four, Deloitte and KPMG, both announced separate partnerships to embrace the adoption of artificial intelligence as part of their service offering.

Deloitte announced an alliance with Kira Systems to bring the power of machine learning to the workplace, an innovation that could relieve workers from the tedium of reviewing complex documents, and extract and structure other textual information for better analysis.

"Wading through miles of corporate jargon hunting for key words and patterns can consume considerable time and resources," says Managing Director of Deloitte's innovation group in the United States, Craig Muraskin. "By teaming with Kira Systems we can help organizations reduce their review time while redeploying talent to higher value activities – let's save our eyes for more strategic matters."

Meanwhile, KPMG announced plans to apply IBM's Watson cognitive computing technology with a focus on its auditing services.

"The cognitive era has arrived," says Lynne Doughtie, KPMG Chairman and Chief Executive Officer in the United States. "KPMG's use of IBM Watson technology will help advance our team's ability to analyse and act on the core financial and operational data so central to the health of organizations and the capital markets."

Cognitive technology enables greater collaboration between humans and systems, providing the ability to communicate in natural language and analyse massive amounts of data to deliver insights more quickly.

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These activities have the potential to advance traditional views on how talent, time, capital and other resources are deployed by professional services organizations. It could free time from audit, tax, advisory and other professional services to focus more on judgment-based tasks.

A recent KPMG report, *2016 China CEO Outlook – Now or Never*, found that CEOs of China-headquartered companies are prioritizing innovation to drive growth and have highlighted it as one of their top strategic priorities, ahead of their global counterparts. Of the 129 respondents, 40 percent said they were using data and analytics to improve financial reporting while 70 percent of CEOs rated considering the integration of basic automated business processes with AI and cognitive processes as one of their top concerns.

Evolving process

Cognitive technology is further advancing improvements to sampling processes, in which auditors review subsets of data. At the same time, the firms say, cognitive-enabled processes allow auditors to focus on higher-value activities, including offering additional insights around risks and other related findings.

Looking back though, this trend isn't really all that new. Many of the developments in computing, and hardware and software capabilities over the past 30 years have, in large part, been driven by the demands of auditing, accord-

By 2025, about 30 percent of corporate audits will be performed by artificial intelligence, according to a survey in 2015 of 800 executives, from the World Economic Forum's Global Agenda Council on the Future of Software & Society.

ing to the father-and-son authors Richard and Daniel Susskind in their recent book, *The Future of the Professions.*

"The amenability of financial statement auditing to technology is long established. In the 1980s auditors were early adopters of spreadsheet and microcomputer technology, and there was much talk about the great potential of 'audit automation.' It was during that era too that the discipline of computer audit came of age – auditors had to have the skills to review and interrogate computer-based accounting systems, as well as paper-based materials," the Susskinds write in the book.

For some, AI strikes a more ominous note; a threat of human endeavour being usurped by machines. The popular fiction depiction of robots and AI replacing humans was popularized by the stories of Isaac Asimov through the 1940s, which were published as a collection *I, Robot* in 1950.

Rather than auditors being replaced by jaunty robots, the future of AI is more often a stack of benign blinking black boxes. One of Hong Kong's leading proponents of AI, City University's Associate Professor in the Department of Computer Science, Andy Chun admits, however, there is no one standard definition of "artificial intelligence."

"I usually explain that AI systems are computer systems that perform intelligent tasks – tasks that we normally think only humans would be able to perform, for example our abilities to speak, listen,

and see, as well as higher-level abilities to solve problems, play board games, produce plans and designs. Any task that normally requires human intelligence can be good potential for using AI," he says.

Over the past decade, Chun has been involved with using AI to schedule engineering work for the MTR, to allot aircraft parking at Chek Lap Kok, to review forms submitted to the Immigration Department, and to roster nurses at the Hospital Authority.

He sees the accounting profession and the task of auditing as highly suited to take advantage of cognitive technology.

"Anything that falls outside the pre-defined professional knowledge, such as requiring common sense for example, AI will fail poorly."

"AI has proven to be well-suited in encoding professional knowledge. It is interesting, but the more specialized the knowledge, the easier it is to apply AI. This is because professional knowledge and associated procedures or processes are well-defined.

"For the accounting profession, there are clear sets of practices as well as guidelines and government regulations. In addition, with

recent advances in machine learning and big data analytics, AI can be used to analyse a much larger volume of data and faster than any human auditor possibly can, as well as the ability to extract useful knowledge from those large data sets," Chun says.

At least for the time being, there is still a definite role for humans in the auditing process.

"AI systems are very narrowly focused. They may be very good at interpreting concrete accounting rules, guidelines, regulations, and best practices. But anything that falls outside the pre-defined professional knowledge, such as requiring common sense for example, AI will fail poorly," he adds. "Also, there is inevitably knowledge that might not be available to AI that only reside in the heads of humans who work in the organization. For example, organizational knowledge that requires having to work in an organization for a long time to accumulate might not be available to AI that is performing the auditing process."

Co-convenor of the Institute's Information Technology Interest Group, Victor Tan, says AI is an exciting area for accountancy.

"We haven't any specific plans to promote awareness or discussion on this but it is a looming subject. I believe exercising professional audit judgments may still lie with humans, but even here, arguably AI could play a big role, given that AI can evaluate a larger amount of data and is inherently objective," Tan says.
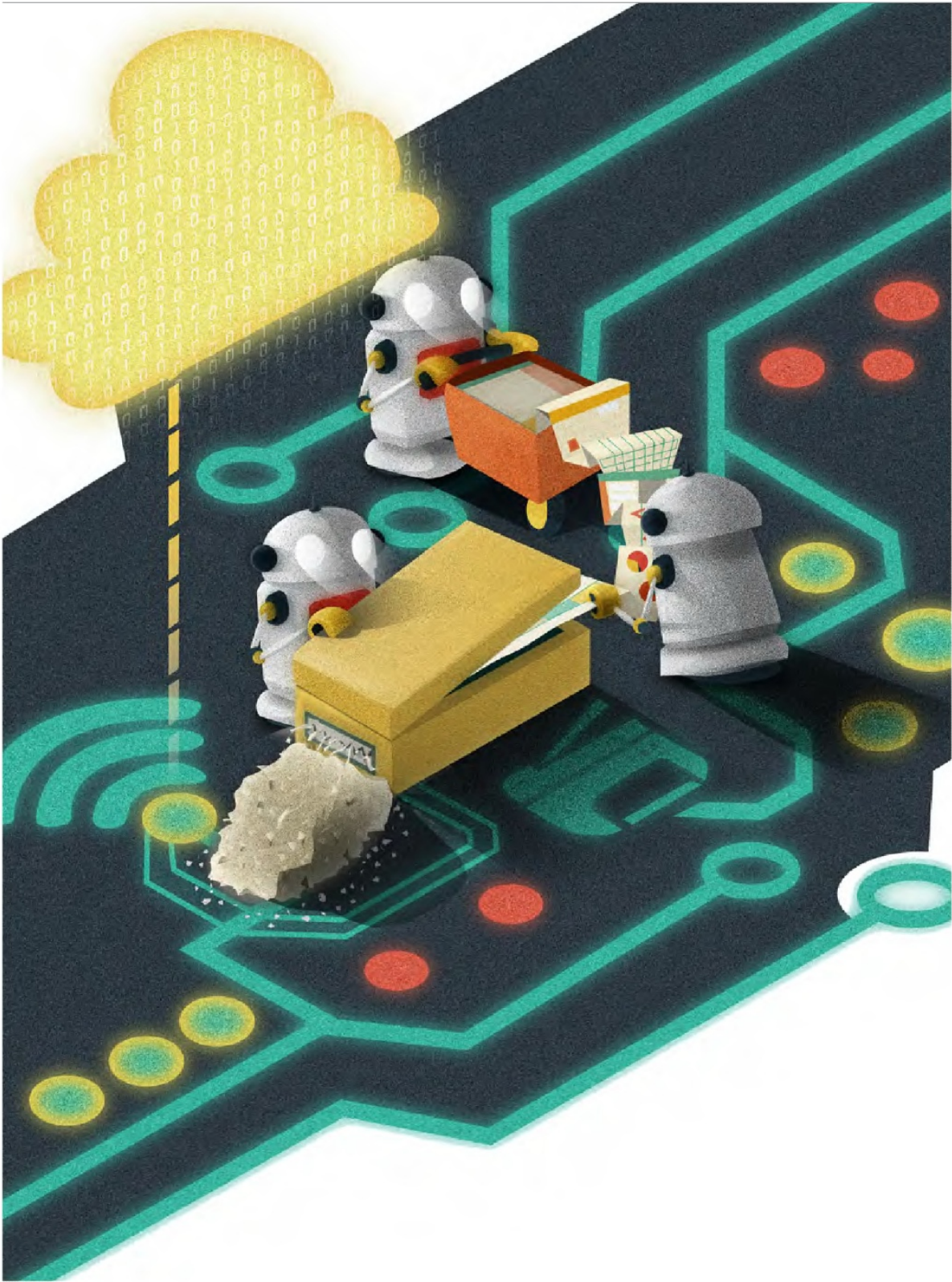
New skills

Preparing existing professionals and students with the skills needed for this new landscape is a concern of professional bodies, universities and firms.

The International Federation of Accountants is looking at what next generation accountants will need to learn and how to prepare for a world of work that differs greatly from today. While the foundation skills of the profession won't change, IFAC feels the curriculum will need to reflect the world around it in order to remain relevant.

"As AI becomes more prevalent, the technical skills we learn as accountants and auditors will need to be supported by learning AI interfaces and understand how AI sources and interprets information," says Sylvia Tsen, IFAC's Senior Director, Quality and Member Relations. "Another key consideration for our profession is the so-called 'soft-skills.' A professional accountant's communication and leadership skills are of increasing importance, which help us to show empathy and emotion – traits beyond machines.

"As technology changes, professionals must adjust – which is exactly what we have always done. The good news is that with so much history of continuous professional development, our profession's flexibility and adaptability is already proven," says Tsen.

In Hong Kong, Deloitte has been investing heavily in in-house training and development for its staff and even extending it to its clients.

Deloitte Partner Peter Koo says professionals may need to have greater comprehension of IT at the input and process stage, and presentation skills at the output end, to make sense of this mass of data for the clients.

"Consulting is a people-oriented business, so you will need better equipped people to go into the market place. If we can change that faster than the others, then we get bigger market share," says Koo, an Institute member.

Nevertheless, AI raises new issues and concerns related to privacy and security, as well as whether the existing standards need to be revised or new industry-wide regulations need to be introduced.

Tsen says technology is almost always ahead of laws and regulations. In relation to auditing and assurance standards, the International Auditing and Assurance Standards Board will in the next couple of months issue a request for input on data analytics.

"IFAC supports the work of the board and all its members are expert volunteers drawn from a wide range of geographies and experiences. Their global perspective is really important to spotting issues and trend, and ensuring audit and assurance standards are relevant and implementable. It's great to know the impact of technology, and how it's used, is very much on the IAASB's radar."

The future is now

Professor Gary Biddle, Chair of Accounting at Hong Kong University and an Institute member, is optimistic for the future of the profession and the new opportunities it presents. However, he foresees it posing not just a challenge to the role of the auditor but to the firms themselves.

"Accounting has always been big data but now what's happening is that organizations of all kinds, profit and not-for-profit, are keeping all of their data on these big servers and that opens up all kinds of implications for how auditing is done," he says, citing Amazon as an example. "They are very big in big data and they can say 'hey, I'm keeping all your data on our servers now, we have software we can offer you and we don't need to sample your transactions anymore, we can audit every one of them.' The whole approach to auditing and even who does it could be profoundly affected."

Experts predict that all financial data will come to be represented in some globally accepted standard form and that the work then will largely involve running ever more powerful algorithms, searches, agents, and routines across the data.

"While the traditional auditor may claim that this will never replace the 'judgment' of the auditor (for example, as to whether the client handling provisions appropriately), the market leaders are now looking very seriously at how artificial intelligence can also help here," the Susskinds write in *The Future of the Professions.*

So, if you are an auditor, should you be worried or excited about the future changes brought by AI?