SPECIAL REPORT

IT jobs in 2020: A leader’s guide
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As IT evolves in the direction of more cloud adoption, more automation, and more artificial intelligence (AI), machine learning (ML) and analytics, it’s clear that the IT jobs landscape will change too. For example, tomorrow’s CIO is likely to become more of a broker and orchestrator of cloud services, juggling the strategic concerns of the C-suite with more tactical demands from business units, and less of an overseer of enterprise applications in on-premises data centres. Meanwhile, IT staff are likely to spend more time in DevOps teams,
integrating multiple cloud services and residual on-premises applications, and enforcing cyber-security, and less time tending racks of servers running siloed client-server apps, or deploying and supporting endpoint devices.

Of course, some traditional IT jobs and tasks will remain, because revolutions don’t happen overnight and there will be good reasons for keeping some workloads running in on-premises data centres. But there’s no doubt which way the IT wind is blowing, across businesses of all sizes.

Historically, technology transitions have seen some jobs eliminated and created negative externalities such as increased inequality or environmental degradation. But new jobs—not always clearly foreseen—are usually created and, so long as the negatives are properly addressed, society as a whole generally benefits.

How will this scenario play out in the AI era, as the pace of change accelerates, and ever higher-level jobs are affected? Let’s start with a ‘macro’ view, and then consider the IT industry in more detail.

MACROECONOMIC TRENDS

In January 2016 the World Economic Forum (WEF) published The Future of Jobs, a report based on a survey of 350 of the world’s largest companies, including over 150 of the Fortune Global 500. Respondents were mostly chief HR officers, as well as other C-suite executives with a strategic focus on talent. The WEF’s focus was the impact of the ‘fourth industrial revolution’—a combination of developments such as artificial intelligence and machine-learning, robotics, nanotechnology, 3D printing, and genetics and biotechnology—on business models and labour markets from 2015 to 2020.

The report’s headline finding was that up to 7.1 million jobs could be lost in 15 major developed and emerging economies due to “redundancy, automation or disintermediation, with the greatest losses in white-collar office and administrative roles”. Partially offsetting this figure, resulting in a net loss of some 5 million jobs, was the predicted creation of 2.1 million new jobs in sectors such as ‘architectural and engineering’ and ‘computer and mathematical’:

Even in industries (such as information and communication technology, or ICT) where employment demand is predicted to be positive, the WEF report flagged up the conjunction of “hard-to-recruit specialist occupations with simultaneous skills instability across many existing roles” as an approaching challenge.

Fortunately for current employees, investment in re-skilling emerged as the top strategic future workforce priority among the WEF’s survey respondents, with 65 percent pursuing this strategy across all industries. In second place was ‘support mobility and job rotation’ at 39 percent.

A December 2016 report—one of the last from President Obama’s administration—examined Artificial Intelligence, Automation and the Economy, noting that “Researchers’ estimates on the scale of threatened jobs over the next decade or two range from 9 to 47 percent,” and that “Research consistently finds that the jobs that are threatened by automation are highly concentrated among lower-paid, lower-skilled, and less-educated workers. This means that automation will continue to put downward pressure on demand for this group, putting downward pressure on wages and upward pressure on inequality.”

On the other side of the coin, the White House report acknowledged that “new jobs are likely to be directly created in areas such as the development and supervision of AI as well as indirectly created in a range of areas throughout the economy as higher incomes lead to expanded demand.”

The report offered three main strategies for addressing the impact of AI-driven automation across the US economy: ‘Invest in and develop AI for its many benefits’; ‘Educate and train Americans for jobs of the future’; and ‘Aid workers in the transition and empower workers to ensure broadly shared growth’.

**The America First/Brexit factor**

The reports quoted above were researched and produced before the recent outbreak of populist nationalism on both sides of the Atlantic really made their presence felt. So it remains to be seen how President Trump’s ‘America First’ doctrine and the UK’s tortuous Brexit process (due to end on 29 March 2019) will affect business models and labour markets. However, given that a major driver of these political developments was a reaction to job losses in traditional industries and resulting increased inequality, further technology-driven unemployment can only exacerbate the situation in these and other countries, unless addressed in time.

In its recent Autumn Budget, the UK government set out a vision for “An economy driven by innovation that will see the UK becoming a world leader in new technologies such as Artificial Intelligence (AI), immersive technology, driverless cars, life sciences, and FinTech.” There was even money set aside for things like AI and driverless cars, R&D, retraining, 5G mobile and fibre broadband. But will such ambitions survive the economic realities of Brexit?
IT INDUSTRY TRENDS

How will the IT industry cope with the coming ‘fourth industrial revolution’? According to the World Economic Forum, the prospects for the ICT sector are good:

With the highest employment growth forecast and average levels of skills stability, ICT looks better placed to weather the next few years than any other sector, according to the WEF survey.

Looking at strategies for future workforce development, the WEF survey also detected an above-average determination in the ICT sector to invest in re-skilling current employees -- 81 percent versus 65 percent across all industries:
Also noticeable in this chart is an increased tendency in ICT to hire more short-term workers and collaborate with educational institutions, and (disappointingly) a decreased emphasis on targeting female talent.

In 2016, the US Department of Labor (DoL) provided a detailed breakdown of job prospects in Computer and Information Technology through to 2026. Overall, employment in the sector is projected to grow an above-average 13 percent between 2016 and 2026. More than half a million new jobs will be created, says the DoL, with demand generated by increased focus on “cloud computing, the collection and storage of big data, and information security”.

Software developers form the most numerous group, both in 2016 and in the 2026 projection, followed by computer support specialists and computer network architects:

The fastest-growing ICT occupations, according to the DoL, will be information security analysts (28%), software developers (24%) and computer and information research scientists (19%). Computer programmers,
meanwhile, are the only group covered by the DoL predicted to decline between 2016 and 2026 (-8%), mainly due to increased outsourcing to emerging economies:

![Computer and IT jobs outlook, 2016-26](image)

Interestingly, three of the four highest-paid IT occupations—computer and information research scientists (median 2016 pay $111,840/year), software developers ($102,280) and information security analysts ($92,600) -- also have the best growth outlook. The outlier is computer network architects, whose 2016 pay and 2026 growth projection figures are $101,210 per year and 6 percent respectively.

A near-term view on IT staffing comes from Spiceworks’ recent 2018 State of IT report. This is based on a survey conducted in July 2017 that gathered responses from 1,003 IT professionals from North America and Europe working in organisations ranging from SMEs to enterprises. Industry sectors covered include manufacturing, healthcare, non-profits, education, government and finance.

When it comes to IT departments’ staffing plans for the year ahead, there’s a clear relationship with company size:

![Expected change in IT staff for 2018](image)
In small and medium-sized businesses, the predominant position is ‘no change’ in IT staff levels, whereas larger businesses (>500 employees) are more likely to be increasing IT headcounts in 2018.

Another annual finger on the pulse of the IT industry is the Gartner CIO Agenda Report, which for the 2018 edition canvassed the views of 3,160 CIOs across 98 countries (representing some $13 trillion in revenue/public-sector budgets and $277 billion in IT spending).

Gartner’s survey provides some pointers to the IT specialisms most likely to be in demand in the near term. When asked which new technologies have required, or will require, new or hard-to-find skills in order to deploy them, artificial intelligence was the clear leader, followed by digital security and the Internet of Things:

The importance of data-related skills was highlighted in a recent publication, The Fourth Industrial Revolution Report (subtitled, in defiance of Betteridge’s Law of Headlines, “Can the UK lead the data-driven world?”). This survey, from Big Data London and Hortonworks, is based on information gathered from 250 respondents in the media & entertainment, banking and retail sectors in the UK.
Echoing research quoted earlier, 60 percent of respondents expect to identify and redeploy transferable skills, while more than half will recruit more permanent staff (54%) or upskill through internal or external training (52%):


Once again, the coming ‘revolution’ doesn’t look as though it will sweep away the existing order—at least as far as IT personnel are concerned.

When it comes to the specific skills sought by this survey’s respondents, the cloud, data science (including AI) and software engineering lead the way:

OUTLOOK

Automation-related job losses are predicted across both developed and emerging economies, predominantly in white-collar office and admin roles. But new—mostly higher-level—jobs will also be created. Managing the transition to mitigate negative effects such as increased inequality will be an important task for governments and businesses.

The IT sector is well placed to weather the coming ‘fourth industrial revolution’, with good employment growth prospects and above-average determination among leading companies to invest in retraining current employees where necessary.

If you’re working in IT or considering a career in this field, look to develop skills in key areas such as cybersecurity, software development and data science (including AI). Don’t fear automation too much just yet, but be prepared to find yourself implementing and/or working with cognitive systems in the near future.
SURVEY: FUTURE IT PROS SHOULD LEARN SECURITY AND COMMUNICATION SKILLS

BY AMY TALBOTT

As technology continues to evolve, so will the skillsets companies look for in potential employees. A recent survey by ZDNet’s sister site Tech Pro Research asked tech professionals about recent and upcoming hiring priorities in their organizations.

The majority of respondents said that if their company had done any IT hiring in the past year, it was in the areas of general support and development. Among respondents whose companies plan to hire IT workers in the upcoming year, these were also the two most common roles. This indicates that despite all the talk of growth in areas like automation and data science, most companies are still looking for talent in more traditional IT jobs.

An open-ended question asking respondents to advise new IT professionals turned up some interesting answers. Expertise in security was the number one skill respondents recommended that those new to IT develop, which probably comes as a surprise to no one.
However, working on soft skills was advised by more respondents than skills more traditionally associated with IT, like development and database administration. One respondent wrote that those going into IT will need a sense of humor and a sense of teamwork. A couple mentioned that the ability to explain technology to users is important. Many others simply wrote in “communication.”

Respondents were also asked about hiring difficulties within their companies and what steps had been taken to fill talent gaps. The survey wrapped up with a question about what IT jobs will have the most growth in upcoming years. Data and analysis for all survey questions can be found in the full report: IT jobs 2018: Hiring priorities, growth areas, and strategies to fill open roles. (Available to Tech Pro Research subscribers.)
The robot revolution has undoubtedly begun, but the jury is still out on exactly how many jobs will be lost to the machines, and how long it will take to happen. In the meantime, though, artificial intelligence (AI) is already impacting jobs in a variety of industries, changing the way a lot of work is getting done.

Whether it’s the implementation of chatbots or machine learning-boosted big data tools, professionals are capturing the value of AI to increase their productivity. However, every job won’t be impacted equally when it comes to these emerging technologies.

Here are the five jobs that will see the biggest increase in efficiency from AI and automation.
1. SECURITY PROFESSIONALS
The cybersecurity field has been utilizing AI and machine learning for some time, with platforms like IBM’s Watson being used to complement the work of human practitioners. For example, many products use AI to determine the patterns of normal users, and alert human security professionals when abnormal behavior is detected.

“Currently, security relies on AI to target risk and to develop proactive threat management systems,” said Gartner research director Carlton Sapp. “However, we see this as aggressively advancing their capabilities, leading to more advanced threat management systems that automatically learn through reinforced training and more innovative ways to reduce risk.”

The biggest barrier to capturing the value of AI in security is trust. A recent Radware report stated that 57 percent of executives trust AI security systems “as much or more than” humans, but there’s still room for growth.

On the other side of the fence, AI is also being used to develop cyber attacks. Security researchers created an AI-infused malware that was able to move past an anti-malware system by modifying itself to slip past the filters. This means that security professionals will likely need to fight AI tools used by hackers with AI tools of their own.

2. BUSINESS INTELLIGENCE (BI)
Business intelligence, with its heavy focus on data analytics, stands to benefit heavily from the proliferation of AI. In addition to providing more in-depth insights, AI will also lessen the amount of work needed to build custom BI apps and tools.

Business intelligence, with its heavy focus on data analytics, stands to benefit heavily from the proliferation of AI. In addition to providing more in-depth insights, AI will also lessen the amount of work needed to build custom BI apps and tools.

Technologies such as Natural Language Processing (NLP) and Natural Language Generation (NLG) will help with the development of drag-and-drop graphical user interfaces (GUI) for BI, making it easier to get insights without custom
coding a solution, according to Boris Evelson, vice president and principal analyst at Forrester Research. This means that data analytics will be “directly available to non-data professionals,” Evelson said.

AI will also make it easier for BI to process unstructured data, Evelson said. “AI-infused BI will somewhat, albeit not completely, automate all of the steps necessary to transform data into formats and models that BI tools can work with—relational structures, and so on,” Evelson said. “This includes machine learning-based data discovery and machine learning-based data curation—cleansing, integration and so on.”

These changes will essentially make more data available for analysis, which will grow the number of jobs for data analysts as well, Evelson noted.

3. HELP DESK
The help desk is the “the starting point for many machine learning projects” in the enterprise, according to Nick Patience, co-founder and research vice president at 451 Research. A big part of this has to do with the introduction of chatbots, conversation-based robots that can handle simple questions via text-based input.

Chatbots have been used in customer service and on retail websites in recent years, but they are now growing in use for help desk requests. J.P. Gownder, vice president and principal analyst at Forrester Research, said that chatbots will soon be leveraged to handle tasks like employee onboarding and password resets, freeing up help desk pros to handle higher-level problems.

“In some cases, automation will replace human headcount in this space, allowing companies to redeploy technology talent elsewhere,” Gownder said.

4. SOFTWARE ENGINEERS/WEB DEVELOPERS
According to Gartner’s Sapp, “AI will become the new UI as it transforms how we enhance the user experience.” This has major implications for consumers, as it changes how they interact with devices or services, but it will also impact the engineers and developers designing those experiences.

Mobile developers may find it easier to create contextual experiences for users, since AI will automatically bring in the most relevant information. On the software side of things, AI will help in the creation of the product itself, automating security and possibly even the development of additional features.

“Software engineers will see radical changes on using AI to develop more resilient systems and applications, ranging from self-healing applications to automated code development,” Sapp said.
5. CIO

In addition to affecting the work of frontline employees, AI and automation will also impact the lives of IT leaders and management. CIOs, in particular, will see a major change in the way they view the organization, said Forrester’s Gownder.

“The CIO’s workforce will be comprised of a mix of digital workers—RPA bots, AI programs, chatbots—and humans, and, keeping this mixed workforce in mind, the CIO will need to hire and train human workers for RQ—the Robotics Quotient, Forrester’s term for the skills required to work well with machines and AI,” Gownder said.

This new organizational structure could make it easier for the CIO to more effectively delegate workforce resources, setting their human employees on the most pressing tasks.

There’s also the augmentation of the personal assistant. While only the most senior executives tend to have a human assistant, said 451 Research’s Patience, in the future every worker will have access to an AI-powered one. This will lead to more efficient scheduling, making it easier for CIOs to plan meetings that work for everyone.
THE 10 IT JOBS THAT WILL BE MOST IN-DEMAND IN 2020

BY ALISON DENISCO RAYOME

As more companies undergo digital transformation, in-demand IT roles will shift by 2020 to include positions focused on advanced technologies such as artificial intelligence (AI), augmented and virtual reality (AR and VR), and the Internet of Things (IoT).

“Demand for tech workers continues to grow at a pace that’s unmatched in other industries,” said Raj Mukherjee, senior vice president of product at job search site Indeed. Several in-demand roles right now, such as full-stack developer, will continue to attract heavy growth in the coming few years, while some newer positions gain prominence as well, Mukherjee said.

A mix of tech and business skills will be required for nearly every position, according to CompTIA chief technology evangelist James Stanger.

“People have been talking for a long time about digital transformation of business,” Stanger said. “We’re going to see a lot of defined job roles either being radically redefined, or even just go away. I think an IT skillset will remain valuable, but it has to be in regards to business. Too long, those things have been kept in siloes.”

Here are the 10 IT jobs that experts predict will be in high demand in 2020.

1. COMPUTER VISION ENGINEER

Demand for computer vision engineers has grown steadily since 2013, according to Indeed data. These professionals build and improve computer vision and machine learning algorithms and analytics to detect, classify, and track objects.

Investments in AR and VR are expected to grow from $11.4 billion in 2017 to $215 billion in 2021, according to IDC. Combined with the rise of self-driving cars, “there’s a huge amount of growth that is going to happen in the future that directly ties to demand for computer vision engineers,” Mukherjee said.

2. MACHINE LEARNING ENGINEER

Machine learning engineers are advanced programmers who develop AI machines and systems that can learn and apply knowledge. These professionals perform sophisticated programming, working with complex datasets and algorithms to train these systems.

“We see every company becoming an AI company; and as that happens, AI will become a top investment area for any tech department,” Mukherjee said. “Machine learning engineers are going to be very high in demand.”
3. NETWORK ANALYST

Businesses are investing more heavily in their networks as IoT enters the workplace. “More and more things are going to need to be connected in an efficient way, and that’s going to be a major driver of demand there,” said Forrester researcher Nate Meneer.

Network analysts in the coming years will combine their technical skill set with an understanding of how to apply it to provide real-time trending information on network traffic, and what those insights means for the business, Stanger said.

“That is going to require somebody who understands more than just networking or more than just understanding of how sensors work—they’re going to fully have to understand the business and they are going to have understand things like AI,” Stanger said. “That’s a radically different job role than today’s job role of knowing how networking works or how security works.”

4. SECURITY ANALYST

Cybersecurity professionals are already in great demand, and that will continue into the future, as attacks grow more sophisticated and technologies to fight them advance.

The role will likely evolve to include more data skills and AI skills, Stanger said. “Security will remain very, very important, and we’re seeing changes from a reactive security model to a proactive one,” Stanger said. “You’re going to see more of a threat-hunting, artificial intelligence-enhanced model.”

5. CLOUD ENGINEER

As the vast majority of companies move important systems to the cloud, more and more are choosing a hybrid approach, with multiple vendors. In the coming years, cloud engineers will develop solutions at scale that are a mix of both in-house technology and outside systems—going beyond Amazon engineers working on AWS or Microsoft engineers working on Azure, Mukherjee said.

6. APP DEVELOPER

Across both end users and vendors, app developers will be in large demand in 2020, Meneer said. “It’s really the intersection of where technical capability comes to face the business need,” he added.

This could be a higher level role than simply coding, according to Forrester analyst Andrew Bartels: The developer may be someone who identifies a need and designs what the code would look like, and sends it off to someone else to do the actual coding.
7. BUSINESS INTELLIGENCE (BI) ANALYST

BI analysts gather data from a number of sources, including internal software, competitor information, and industry trends, to develop a sense of where the company stands in the industry and how they can both grow and cut costs.

These professionals act as a counterpart to the app developers, who start from the app and take requirements in, Bartels said. The business analyst starts with the business side, and considers what the company needs in terms of apps to make the process work, he added.

As technology becomes deeply integrated into the operations of business units, more employees will need assistance from support specialists, especially as the workforce transitions.

8. DEVOPS LEAD

As more app developers and business analysts come on board, DevOps teams will also need to be expanded to oversee and coordinate work between those groups, Bartels said.

These professionals bring skills in development and project management that are required in many companies, even outside the context of software development, Meneer said. They may be found under different titles in the future, but the skillsets will continue to be in demand.

“Every single company wants to run their engineering organization as efficiently and as effectively as possible, because that’s one of the biggest cost enter,” Mukherjee said. “DevOps plays a very important role in driving better efficiency and delivering software faster for those companies.”

9. DATABASE ADMINISTRATOR

Database administrators will become more in-demand by 2020, particularly as companies move toward more software offerings that include AI, and the ability to create AI-powered models, Meneer said. “Having well-maintained databases is really the secret to allowing those products to work effectively,” he added.

10. USER SUPPORT SPECIALIST

As technology becomes deeply integrated into the operations of business units, more employees will need assistance from support specialists, especially as the workforce transitions, Meneer said. “As companies go through digital transformations, suddenly they find their operations increasingly interwoven into these systems,” he added. “You’re going to need the professionals who can support that.”
With all of these positions and new skills on the horizon, employers need to be proactive in providing training to workers, Bartels said.

“One of the things that we’ve seen is a fast pace of change in the skills that are required and consequently, the importance of having training mechanisms in place to be continually upskilling your workers for the new types of skills that may be coming in demand,” Bartels said. “Don’t assume that this problem will take care of itself. Be proactive in terms of identifying skills gaps, putting in place training to help close those gaps, making sure that you really are focused on your human resources.”

For any tech position, soft skills are also key to develop, Meneer said.

“Employees who offer both technical skills and soft skills such as communication and empathy are really the workers that are in demand right now,” Meneer said. “Having a really clear understanding of how the technology is leveraged to improve business processes and how that pulls into strategy are also going to be increasingly important things that shouldn’t be forgotten as tech workers contemplate their careers.”
OVER THE PAST YEAR, THERE HAS BEEN GENERAL CONSENSUS AMONG IT RECRUITERS AND HIRING MANAGERS THAT COMPUTER AND INFORMATION RESEARCH SCIENTISTS, INFORMATION SECURITY ANALYSTS, AND COMPUTER SYSTEMS ENGINEERS AND ARCHITECTS ARE AMONG THE IT POSITIONS THAT ARE MOST DIFFICULT TO FILL. MANY OF THESE POSITIONS COME FROM THE STEM (SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS) FIELD, WHICH REQUIRES ITS PRACTITIONERS TO COMMIT TO YEARS OF STUDY AND SKILLS DEVELOPMENT.

PEOPLE WITH THESE SKILLS CAN CALL THEIR OWN SHOTS WITH EMPLOYERS BECAUSE THEIR QUALIFICATIONS ARE HARD TO FIND. WHEN A CIO DOES FIND THE RIGHT CANDIDATE AND MAKES AN OFFER, IT COMES WITH STOCK OPTIONS AND A SIX-Figure INCOME. OF COURSE, NOT EVERY COMPANY CAN AFFORD THIS.

ONE TIER BELOW THESE EXPERTS ARE OTHER HARD-TO-FIND EMPLOYEES: MOBILE APP DEVELOPERS, WEB DEVELOPERS, SECURITY SPECIALISTS, NETWORK ENGINEERS, AND THOSE SKILLED IN PARTICULAR APPLICATION OR DATABASE NICHEs, SUCH AS ERP SOFTWARE SPECIALISTS IN SAP, OR DATABASE EXPERTS IN SOFTWARE LIKE ORACLE. THESE INDIVIDUALS MIGHT NOT BE QUITE AS EXPENSIVE AS COMPUTER SYSTEMS ENGINEERS OR INFORMATION SECURITY ANALYSTS, BUT THEY ARE FIERCELY CONTENTED FOR.

OTHER FACTORS ARE IN PLAY, TOO. IT MANAGERS WANT SKILLED WORKERS, NOT APPRENTICES. THE COMPETITION INTENSIFIES WHEN COMPANIES ARE ALL CHASING THE SAME TALENT AND THE AVAILABLE TALENT IS SCARCE.

WHAT CAN YOU DO AS A CIO TO FILL THESE ROLES WHEN THE SKILLS DON’T ABOUND IN THE MARKET? HERE ARE SIX STRATEGIES THAT MAY HELP.
1. Work your staff’s networks
When I was a CIO at a midsize company, I found it almost impossible to hire database administrators and system programmers when I tried to go head to head with larger firms. Then, I tried something else. I met with my most senior people in these disciplines and asked them if they would reach out to “known quality” colleagues whom they knew from their technical circles. As staff members began to work their personal tech networks, we suddenly landed a brilliant system programmer from a major Big Ten University that was located across town. Later, we hired an accomplished software developer from a large food and beverage company. We never would have signed these folks up if their fellow colleagues who worked for us hadn’t sold them on the benefits of working for our company.

2. Appeal to what candidates are looking for above and beyond money
I once hired a DBA who had been around the block. He was in his late forties and wanted a chance to mentor new people as well as to command a leading position in a database group. The large company he was coming from was so compartmentalized that he didn’t feel he was getting a holistic experience that included everything there was to strategize about, budget for, or implement that involved a database. Our “smaller” opportunity offered that. There are other intangibles that people want—and that you can compete on. Some of the most popular intangibles are a trusting work environment, a chance for more responsibility, opportunities for personal and/or professional enrichment, a sense of community, and the ability to make a difference.

3. Hire your contractors
There are contractors who are expert in areas like system programming, DevOps, and network security—and they might consider signing up for the right kind of permanent job if they feel good working for you.

CIOs should continuously evaluate the talent they have in-house, identifying staff members who can rise to the challenge of a new position with the proper training.

For some contractors, the “right” kind of job is a chance to get off the road or to find relief from the constant search for the next gig. It is wise to check a few boxes, though, before offering a contractor permanent employment. They should be someone who has already shown that they can provide the technical expertise you need. They should also get along well with staff and feel at home in your corporate culture.

4. Cross-train internal talent
You probably already have internal workers who would love to be trained into the hard-to-fill jobs you need staffed. For his reason, CIOs should
continuously evaluate the talent they have in-house, identifying staff members who can rise to the challenge of a new position with the proper training. It might take longer to cross-train a staff person into a new position, but the benefits are worth it. One, you get a loyal employee who is likely to stay with you. Two, cross-training that employee (and others) becomes an object lesson for the rest of your staff. They know you are willing to invest in them professionally and personally. This builds loyalty.

5. Team with local universities and vocational schools
Many companies now work with local universities and vocational schools in the development of IT curriculum. Companies also give out internships to students on company projects as part of students’ hands-on college education. This enables companies to evaluate the interns and offer the most promising ones permanent positions. Since a company has already worked with a university to tailor its IT curriculum to the needs of the company, it gets a new hire who is familiar with the company’s IT environment and who comes pre-trained in DevOps, systems, database, or security.

6. Don’t forget about the business-savvy business analyst
An IT person who knows the technology and the business and who can communicate equally well with users and DBAs is worth their weight in gold. So is the super-user who knows the business and has a strong understanding of IT. Either can make a great business analyst.

These people don’t tend to appear on hard-to-fill position lists in IT surveys, but they are rare gems when you find them—and they are exactly what companies need most: go-getters who bring people together and forge great ideas to advance the business.
IT PROS WILL NEED A DIVERSE SKILL SET TO BE EMPLOYED IN 2020

BY CHRISTINE PARIZO

If there is a consensus in the IT world, it is that developing a diverse set of skills--ranging from cloud services to soft skills to information security--will help keep IT professionals employed in 2020. Artificial intelligence, big data, and the widespread adoption of everything-as-a-service (XaaS) means that traditional IT positions like network administrator may no longer be in demand.

Leaving out cybersecurity, which will be in demand as long as hackers continue to attack systems, IT professionals and those in the industry have differing opinions about what skills IT workers will need to remain employed in 2020. However, a few key skills have emerged as critical for IT professionals in the future, including soft skills like teamwork, general IT knowledge, and programming.

Teamwork and project management are two of the soft skills identified as necessary for successful employment in the future. According to Joshua Peskay, vice president of technology strategy at RoundTable Technology, the changing nature of the tech landscape means that IT professionals need to identify opportunities and execute projects quickly to help keep the business competitive.
“The ability of an IT professional to work effectively on project teams for many different types of projects and, even better, be able to manage those projects, is already a critical skill and is only going to become more in demand,” Peskay said.

Some of that management will extend to finding and utilizing outside resources to solve business problems. IT professionals may be tasked with managing in-house personnel, as well as contractors, crowdsource platforms, cloud services, and other external resources. “An IT professional who is both familiar with and can engage successfully with all of these resource types will have a huge advantage in the marketplace,” he said.

The shifting IT landscape also means that IT professionals will need to acclimate to the ongoing changes. Soft skills such as emotional intelligence and cognitive flexibility will help them adapt to both the marketplace and the constant fluctuations within the industry, said Holly Benson, vice president and organizational transformation consulting expert at Infosys.

“These non-technical skills help fuel the innovation, creativity and collaboration within organizations that power growth,” Benson said.

THESE TECHNICAL SKILLS WILL BE VALUED IN 2020
The volatility of the IT industry requires IT professionals to stay on top of critical technical skills as well. While their roles may not require as much hardware know-how, a solid understanding of computer networking concepts and the processes and language of integration between applications and services will always be in demand, said Tom Roark, manager of IT operations at Toast.

“As IT departments place more responsibilities on automation and SaaS tools, the need for stable networking and robust connectors between platforms will continue to grow. Cloud computing has been a revolutionary technology and one everyone should be at least somewhat familiar with,” he said.

In addition, AI and machine learning will be valued in 2020, according to Greg Cox, CTO architect at Sungard Availability Services. “Being skilled in AI will become a requirement for those working in areas of technology that are not purely hardware focused,” he said. While being proficient with AI skills will be important, mathematics and general computer science principles will also be required.

PROGRAMMING WILL ALWAYS BE IN DEMAND
And even though technology continues to develop and change, organizations will still need strong programmers, said Kal Vissa, senior product manager at CloudBees. “As cloud computing evolves, microservices architecture and container orchestration technologies, such as Kubernetes, are becoming mainstream within enterprises,” he said.
Programmers must also keep on top of programming trends to stay relevant, Vissa said. They need to understand where the industry is headed and prepare to adapt to changes before they happen.

“Anyone who is new to programming should focus on the fundamentals … and be a stickler for detail,” he said. Rigorously testing and documenting code and understanding design patterns are habits that new programmers need to develop as soon as possible.

DEVELOPING AND HONING SKILL SETS REQUIRES ONGOING EDUCATION

While some of these skills can’t be taught in a classroom, especially soft skills, IT professionals do have options when it comes to learning programming and other skills. The internet is full of free programming resources, as well as low-cost training options. Webinars offer another way to learn new skills and stay on top of trends.

Resources like meet-ups and conferences can help IT professionals sharpen their skills, too, especially when it comes to understanding emerging technologies, Vissa said. “This allows them to not only learn from experts, but also to network with other IT professionals who can share tips and tricks they’ve learned. Hearing directly from others in the industry what they’re trying or moving away from is invaluable.”
Advances in technology are reshaping the IT workforce, with many businesses looking to grow their capabilities around big data, artificial intelligence (AI), and the Internet of Things (IoT).

Meeting the demands of a highly digitised and interconnected world where advanced technical skillsets are required but are in short supply requires creative thinking, according to Microsoft Australia CTO James Kavanagh.
Rather than fixating on the lack of specialised talent in the market, Kavanagh suggests businesses explore ways to unlock the potential of existing talent, which starts with identifying the depth of skills required to deliver high-priority business outcomes.

“There can be a danger in trying to develop extremely deep expertise in machine learning and data science. There just aren’t enough people and there aren’t enough skills available,” he told ZDNet.

“CIOs [need] to understand at what level do we need the skills. Do we need them deep in the technical space? Or do we need them more in business? Or more in the understanding of data and applying it?”

Given the availability of off-the-shelf platforms, businesses might not require deep expertise in areas such as machine learning, Kavanagh said. Instead, developers can use off-the-shelf platforms without being tangled in the mathematical or scientific complexities behind it.

“There is an ecosystem of partners of ours and others who are building new solutions ... they take many of the core services that we have in cognitive [computing] and machine learning, but they specialise it to specific circumstances in high security, in government, in financial services,” he said.

Kavanagh also noted that a lot of organisations in Australia are trialling new technologies as part of their digital transformation initiatives, and are rapidly building relevant skillsets in the process.

“In October, technology analyst firm Gartner published survey results indicating higher adoption of IoT, AI, conversational interfaces, virtual reality (VR) and augmented reality (AR), and blockchain in the Asia-Pacific region than other markets.

According to Gartner, 43 percent of CIOs in the Asia-Pacific region said they have deployed or are in the short-term planning for deployment of IoT technologies, compared to 37 percent globally; 37 percent for AI, compared to 25 percent globally; 28 percent for conversational interfaces, compared to 21 percent globally; 20 percent for VR and AR, compared to 17 percent globally; and 13 percent for blockchain-based technology, compared to 9 percent globally.

Kavanagh strongly advocates experimentation, saying that “short, rapid sprints of experimentation will yield the best results”, while enabling organisations to understand which skills require more or less focus moving forward.

But understanding data is certainly one of the most important skills to possess today, Kavanagh admitted.

“There can be a danger in trying to develop extremely deep expertise in machine learning and data science. There just aren’t enough people and there aren’t enough skills available.”

—James Kavanagh
“Maybe there aren’t enough data scientists, but there are lots of people who understand data, lots of people who can understand how that data gets applied,” he said. “It’s really about applying that data and applying the tools to try and drive business improvement.”

**NURETURE YOUR EXISTING EMPLOYEES**

In the developed world, where talent shortages in technical fields are expected to persist, Kavanagh suggests that organisations consider broadening the skillsets of existing employees, while supporting them as the nature of their jobs change.

“If you think about what a chartered accountant does, they understand the numbers, the finances of a business. They’re one of the skills, one of the industries at most risk of disruption by automation. So [Chartered Accountants Australia and New Zealand] made a choice and said we need to actually change the way a chartered accountant works,” Kavanagh said.

“They invested in data science skills, in training and learning, in building a platform to take financial data from their clients and make it available in portals so their chartered accountants can process them and make decisions. Those chartered accountants can then guide their clients on good choices for their business.”

In this scenario, instead of hunting for scarce data scientists, Kavanagh said chartered accountants can be thought of as financially literate data specialists.

“The job of a chartered accountant today is not what the job of a chartered accountant was 10 years ago and won’t be in 10 years from now. So it’s about bringing data science tools to their work, not expecting them to become data scientists, but bringing it to them so they can adapt,” he said.

That’s not to say that organisations should ignore the market for specialised talent, just that tectonic market shifts such as evolving customer needs and increasing competition, in combination with disproportionate supply and demand, necessitate strategic thinking.

“Do [organisations] need more skills? Yes, but it’s a difficult marketplace. And so, to some extent, if they have people who are great at dev, or great at IT, or great at
business, upskill those and nurture those people, because as they approach the market, they’ll find that it’s a hot market,” Kavanagh said.

Microsoft seems to adopt the approaches it preaches, encouraging employees to expand their knowledge base by immersing themselves in different areas of business, according to Kavanagh.

“As we transitioned over the last few years to a new strategy, leadership, and focus, one of the most fundamental principles was developing a growth mindset—the idea that we’re not all experts and we’ll make mistakes,” he said.

“What we’ve found is that there’s a much more open recognition that we don’t know everything ... If you don’t know the data science, then you learn, you make mistakes along the way, but you continue to experiment.

“On top of that, there’s more formal training, but 80 percent is in the culture and the growth mindset, and 20 percent might be the training and the skills development.”

Microsoft believes it’s more effective to encourage employees to take ownership of their own learning experience, rather than throw modules at them.

“We try to make it as self-directed as possible, so a lot of it is about on-the-job learning, learning from each other within teams across the organisation,” he said. “A lot of it is sprint-based work. It might be a six-week project that people are involved in who don’t have that domain [expertise].

“There are programs on top of that, but we tend to focus programs on things like inclusion and broadening people’s horizons so that they have a broader view of the problem and the challenge.”

Kavanagh, who is also the Microsoft Azure engineering lead for Australia and New Zealand, makes a conscious effort to invite contribution from employees in other business units.

“Something I try and do with my teams is bring people from other parts of the business who on paper don’t have the skills for the job—they don’t have the five years’ experience, they don’t have deep technical experience—but all come with a perspective and can contribute from that perspective, especially when you’re talking about six-week sprints,” he said.

“To have an intern participate in a six-week sprint, to have somebody from a totally different part of the business participate, it changes the whole dynamic of that sprint. Yes, you should have your core team, but allow that team to have participants from the most diverse parts of the business. They will surprise you. What they come with is usually far more valuable than what’s on paper or what their experiences are.

“I treasure both generalists and specialists, but there’s this concept of the T-shaped skillset—very deep in one area, very broad in another. That’s what we all look for, but we don’t always find it. You have to help people develop and nurture it.”
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