

# How companies can win in the seven tech-talent battlegrounds

Companies have to hire the best, but that won't be enough. They'll also need to rethink how they reskill and upskill their people.

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**With the acceleration in digital**, the demands on technology—for speed, flexibility, reliability, security, and value—have radically increased. For CIOs surveying how to transform their organizations, one tricky question is emerging: Where do I find the people to do all the work?

Few executives would debate the importance of talent or the difficulty that many have in attracting and keeping top people. But companies nevertheless aren't treating tech talent with the urgency it demands. Respondents to a recent McKinsey survey report more significant impact from talent transformations than from any other technology-based play. Yet talent transformations are relatively rare. Only 27 percent say their companies have pursued one in the past two years, and just 15 percent believe they will do so in the next two years.<sup>1</sup>

Amidst this reality, the increasing complexity of IT systems and the emergence of a broad range of new technologies, from cloud to artificial intelligence (AI) to machine learning, have increased the challenges. One European CEO and football fan explained it this way: if you gave him a big enough budget, he'd be confident he could put together a winning team. But a cricket team? He wouldn't know where to start, since he doesn't know anything about the game. He used the analogy to point out how hard it can be for leaders to know what talent they actually need.

A few companies, however, have started to crack the code. Companies winning in this arena have identified at a granular level the tech skills they need to build value for the business, have developed a clear view of their present and future talent needs, and are intentional about finding both top talent and adaptable learners. Crucially, these leaders understand that it's impossible to hire everyone you need; training and reskilling the existing workforce has to be a core part of the strategy to win the talent battle. Some 82 percent of global executives expect that reskilling and

upskilling will be at least half of the solution to their persistent skill gaps.<sup>2</sup>

## Seven emerging tech-talent battlegrounds

To better understand what tech talent will matter most in the next three to five years, we spoke with hundreds of global CIOs, analyzed talent developments over two years across three global markets, and reviewed more than 30 cross-cutting tech trends. We then mapped relevant skills and roles to the most significant emerging tech trends and business needs. For example, given the increasing importance of using data to make better and faster decisions, the ability to rapidly build infrastructure and architecture for data (data-engineer skills) is likely to become more of a bottleneck than the ability to generate insights (data-scientist skills).

Through this analysis, we identified about 4,000 tech skills, which we broke down into seven battlegrounds, or clusters of need (see chart on the next page). (Note: while cultural and change-management aspects, including social and emotional skills, are also important, our research honed in on tech skills only).

Significant skills gaps in these seven areas already exist, and we expect them to become more severe over time. Executives expect skills mismatches in functions that have already started adopting automation and AI technologies, according to McKinsey Global Institute analysis.<sup>3</sup> The largest percentage of survey respondents (more than 30 percent) ranked data analytics, IT, mobile, and web design as the skills with the highest expectation of a mismatch over the next three years.

In Germany, 700,000 additional tech specialists are needed by 2023 to meet the economy's demand for them.<sup>4</sup> For agile skills, demand will be four times greater than supply, and for big data talent, 50 to 60 percent greater.<sup>5</sup> Globally, 3.5

<sup>1</sup> McKinsey Global Survey on IT and the Business, August 2020.

<sup>2</sup> For more, see "Retraining and reskilling workers in the age of automation," McKinsey Global Institute, January 2018, on McKinsey.com.

<sup>3</sup> For the full McKinsey Global Institute report, see "Skill shift: Automation and the future of the workforce," May 2018, on McKinsey.com.

<sup>4</sup> Julian Kirchherr, Julia Klier, Cornels Lehmann-Brauns, and Mathias Winde, "Future skills: Which skills are lacking in Germany," Stifterverband and McKinsey & Company, September 2018, stifterverband.com.

<sup>5</sup> Satty Bhens, Ling Lau, and Hugo Sarrazin, "The new tech talent you need to succeed in digital," September 2016, McKinsey.com.

<b>Battleground</b>	<b>Rationale</b>	<b>Tech skills (sample set)</b>
<b>DevOps</b>	Faster and continuous delivery of features, more stable environments, and reduced operations time. (For more, read “Agile, reliable, secure, compliant IT: Fulfilling the promise of DevSecOps,” on McKinsey.com.)	<ul style="list-style-type: none"> <li>• Agile product-life-cycle management</li> <li>• DevSecOps</li> <li>• Continuous integration and delivery (CI/CD)</li> <li>• Microservices architecture</li> </ul>
<b>Customer experience</b>	Significant shifts in customer behavior as a result of COVID-19 and rising customer expectations; need to deliver top experiences across a wide array of channels; prioritization of personalized over generic design (while maintaining privacy); continuous test-and-learn cycles. (For more, read “Elevating customer experience excellence in the next normal,” on McKinsey.com.)	<ul style="list-style-type: none"> <li>• Predictive/nudge analytics</li> <li>• Design thinking</li> <li>• Test-and-learn at scale</li> <li>• Automated testing</li> <li>• Prototyping</li> </ul>
<b>Cloud</b>	Infrastructure increasingly provided through next-gen cloud architecture, the time to market of services is vastly improved, solutions are more easily scalable; acceleration of transformation and increased source of competitive value. (For more, read “Capturing value in the cloud,” on McKinsey.com.)	<ul style="list-style-type: none"> <li>• Kubernetes</li> <li>• Docker</li> <li>• Multicloud and hybrid-cloud architecture</li> <li>• Security</li> <li>• Smart distribution/metering</li> <li>• Edge computing</li> </ul>
<b>Automation</b>	Significant number of tasks automatable: about 22 percent of workforce activities across the European Union could be automated by 2030, <sup>6</sup> for example, through end-to-end automation across development, testing, and deployment processes—accelerating development and reducing errors. (For more, read “The imperatives for automation success,” on McKinsey.com.)	<ul style="list-style-type: none"> <li>• Cognitive AI</li> <li>• RPA technologies</li> <li>• Automation anywhere</li> <li>• Machine learning</li> <li>• AI-enabled analytics</li> <li>• Quantum computing</li> </ul>
<b>Platforms and products</b>	Platform-as-a-service (PaaS) operating model provides foundation for development with reusable code; “building-block” product approach to development speeds up releases and makes process more flexible. (For more, read “The platform play: How to operate like a tech company,” on McKinsey.com.)	<ul style="list-style-type: none"> <li>• Life-cycle management across platform layers</li> <li>• Industrial Internet of Things (IIoT)</li> <li>• Vertical software as a service (SaaS)</li> </ul>
<b>Data management</b>	Need for real-time data-driven insights, data democratization (nonexpert users making advanced data queries), acceleration of both data quantity and variability. (For more, read “How to build a data architecture to drive innovation—today and tomorrow,” on McKinsey.com.)	<ul style="list-style-type: none"> <li>• Use-case life-cycle management</li> <li>• Synthetic data</li> <li>• Data governance</li> <li>• Automated machine learning</li> </ul>
<b>Cybersecurity and privacy</b>	Data breaches are increasing while data-privacy concerns are resulting in varied regulatory changes, forcing companies to rethink security and compliance protocols. (For more, read “A dual cybersecurity mindset for the next normal,” on McKinsey.com.)	<ul style="list-style-type: none"> <li>• Shift-left security</li> <li>• Automated testing</li> <li>• Zero-trust security</li> <li>• Data-protection law and practices</li> </ul>

<sup>6</sup> For more, see “The future of work in Europe,” McKinsey Global Institute, June 2020, on McKinsey.com.

million cybersecurity positions are projected to be unfilled in 2021.<sup>7</sup>

In addition to meeting the challenges of filling future roles, technology modernization requires knowledge of how to transition from existing systems, which are often written in outdated programming languages, such as LISP, ALGOL 58, or COBOL, and are understood mostly by an aging workforce.<sup>8</sup>

## Closing the talent gap

To succeed in the seven tech-talent battlegrounds, companies will need to use a set of well-considered strategies: hiring, reskilling (training employees for new roles), upskilling (training within an existing role), reallocating, and sourcing. Which strategies to pursue depend on a company's starting point and specific needs (see sidebar "Four archetypes for addressing talent gaps"). For this article, we focus on hiring, reskilling, and upskilling.

The first step in closing the skills gap is rigorous discipline in identifying specific talent needs. In a McKinsey survey, nearly twice as many respondents who report successful transformations say their companies set hiring goals based on specific skills needs, compared with respondents whose organizations don't set those same kind of goals.<sup>9</sup> They do so by evaluating relevant trends, identifying the corresponding skills needed over the next three to five years. Importantly, they identify skills at a level of precision necessary so they can target the right hires and build out relevant training programs.

### Hiring practices that work

We have found the following hiring practices to be most effective:

- *Favoring quality over quantity.* Given the scale of the need, organizations tend to focus on quantity. However, they should favor quality even more. A single expert or highly skilled engineer is as productive as eight novices. The most effective

IT organizations are built around small cadres of high-performance people working in highly self-motivated, self-managing, and agile teams.

Finding these anchor hires and being prepared to pay more for them is more cost-effective in the long run—and greatly helps in recruiting additional people who want to work with the best. Spotting quality talent is notoriously difficult, however, because companies are often unclear about how to evaluate their talent effectively. Top companies, however, identify top performance through a hierarchy of observable behaviors.

- *Finding adaptable learners.* Tech talent has always been accustomed to lifelong learning as their fields change and new ones emerge. Technology skills evolve so quickly that focusing solely on credentials and specific skills when hiring is not enough. In addition to specialized talent, the best companies look for "strong talent," which has the ability to learn and adapt. As one executive said, "We're not looking for people with skills; we're looking for people who can learn skills."

The flip side of this coin is nurturing an environment for learning. In a survey of IT experts, the majority of respondents said they regard employee training as a crucial driver of career success, even more important than IT certifications.<sup>10</sup> But beyond formal training, the best companies explicitly provide their people with time to learn, budgets to fund experimentation, and access to new technologies, as well as flexible career paths that provide additional learning opportunities.

- *"Techies for techies" recruiting.* To hire good tech talent, you need to involve your top talent in the recruiting process. The reality is that techies want to talk to techies rather

<sup>7</sup> Steve Morgan "Cybersecurity talent crunch to create 3.5 million unfilled jobs globally by 2021," Cybersecurity Ventures, October 24, 2019, cybersecurityventures.com.

<sup>8</sup> Patrick McGeehan, "He needs jobless benefits. He was told to find a fax machine," *New York Times*, April 4, 2020, nytimes.com.

<sup>9</sup> "Unlocking success in digital transformations," October 2018, McKinsey.com.

<sup>10</sup> "What IT pros think about IT training," LinkedIn, January 2017, learning.linkedin.com.

## Four archetypes for addressing talent gaps

Four organizational archetypes determine how companies address their tech-talent challenges (exhibit).

### The traditionalist: Upskilling

Extensive skills gaps paired with an inability to attract top talent predisposes this archetype to focus on upskilling and reskilling existing employees. Digital learning platforms can help to make training scalable, applicable across locations, and also feasible during COVID-19 restrictions.

### The digitizing incumbent: Skilling–hiring mix

This archetype in general still has a large tech-skills gap, especially in quantity of skills, with a slightly smaller gap in quality of skills. In addition to reskilling employees, the focus is on hiring new tech talent, though that can prove to be a challenge.

### The emerging digitalist: Redeploying and hiring

The emerging digitalist is prone to focusing on hiring to address a moderate—though widening (due to business growth)—skills gap. In this case, redeploying talent to the most value-generating needs can be particularly effective. Our research reveals that, on average, leading companies reallocate digital talent more than five times faster than their peers.

### The digital native: Continuous reskilling and hiring

Leadership at digital-native companies is typically aware of technology’s critical role and the need to stay abreast of the competition. If a skills gap arises at all, it is likely to happen because a tech firm undergoes yet another IT paradigm shift, from mobile-first to AI-first, for example. They are then aggressive both in hiring the necessary talent and in reskilling relevant people.

Exhibit

## IT organizations typically fall into one of four archetypes, each with varying approaches to closing skills gaps.

	① The traditionalist	② The digitizing incumbent	③ The emerging digitalist	④ The digital native
Characteristics of the IT organization	IT assumes a <b>support function</b> ; outdated working model and tech stack, tenured staff, and lack of belief in the power of technology impede reorientation	IT assumes an <b>enabling function</b> and is understood to be important for reaping efficiency gains or discovering new frontiers in an incumbent’s core business	IT assumes a <b>central function</b> in the setup of a new digital business within an existing incumbent and is expected to unlock new value pools in addition to those in the core	IT assumes a <b>strategic function</b> , and an IT-first mindset permeates all teams; state-of-the-art tech stack, adaptable top talent, and tech-forward IT operations model act as enablers
Sample organization	Public-sector institution aims to digitize processes	Large bank decides to digitally transform its core business from the ground up	Automotive incumbent builds digital attacker (new digital business in addition to core business)	Leading tech firm undergoes yet another IT paradigm shift (eg, from mobile-first to AI-first)
Strategies to close the gap	Extensive qual and quant gaps paired with limited ability to revamp employee base leads to upskilling focus	Large quant gap paired with openness to revamp employee base leads to skilling and hiring focus	Medium quant gap paired with overall business growth leads to redeploying and hiring focus	Modest qual gap paired with overall business growth leads to continuous reskilling and hiring top talent
Upskilling	●●●	●	●	●
Reskilling	●●	●●	●	●●
Hiring	●	●	●●●	●●

than to HR people with limited tech knowledge. Acquiring top talent also requires the use of a broad set of recruiting channels, such as developer conferences and hackathons; an open mind about educational qualifications and an awareness that 85 percent of developers are at least partially self-taught; aspirational goals that inspire; and a demonstrated commitment to building a diverse and inclusive workforce.<sup>11</sup>

- *Moving quickly.* Job seekers in the tech world are impatient. Applicants often have various offers and are used to rapid recruiting processes: 57 percent of job seekers are unhappy with the waiting time after an interview, while 23 percent are willing to wait only one week to hear back.<sup>12</sup>

## Practical guide for reskilling and upskilling

According to the World Economic Forum, around 54 percent of all employees will need reskilling and upskilling by 2022. Of these, 35 percent will require up to six months of training, 9 percent will need six to 12 months, and 10 percent more than a year.<sup>13</sup> The best programs will focus on the following practices.

### Use budget strategically

Reskilling is cheaper than hiring. While reskilling an internal employee may cost \$20,000 or less, the cost of hiring often costs \$30,000 for recruitment alone, in addition to onboarding training. And new hires are two to three times more likely to then leave.<sup>14</sup> Large tech players understand this and often opt to invest more significantly in reskilling their workforce.

Effective reskilling and upskilling, however, don't require large outlays. By using existing training budgets more strategically, companies can move

away from broad learning programs to targeted learning journeys that focus on top-priority areas for the business. In addition, the courses can be short. Tech-learning providers offer introductory courses that take only a few hours or degree programs that can be completed within three to six months, with less than 15 hours of learning effort per week.<sup>15</sup>

### Build learning journeys

A learning journey is a set of connected learning experiences that drive sustained performance improvements (exhibit). Learning journeys have been highly effective in closing skills gaps, as they blend a variety of different training formats, such as digital, cohort-based, or on-the-job learning.

COVID-19 has accelerated the full digitization of all learning-journey components. These dynamics not only make it possible to scale learning efforts more cost effectively but also offer greater personalization for learners.<sup>16</sup>

For example, a leading US insurer identified 15 to 20 critical talent pools among its more than 17,000-strong workforce, to determine the potential of displaced individuals to be reskilled and redeployed. The insurer designed learning journeys to upskill and reskill current roles to the roles of the future, such as the business translator. This learning-journey approach made it possible to reskill or redeploy 40 percent of the overall workforce.

In another example, a European regional bank linked its learning journeys to concrete new career paths. In addition to learning-journey-based reskilling, almost all of the more than 30,000 employees used mobile-app digital learning courses to build skills identified as important for the company's future.

<sup>11</sup> Tomas Chamorro-Premuzic and Jonathan Kirschner, "How the best managers identify and develop talent," *Harvard Business Review*, January 9, 2020, hbr.org.

<sup>12</sup> "Are you taking too long to hire?" Robert Half, 2016, roberthalf.com.

<sup>13</sup> *The future of jobs report 2018*, World Economic Forum, September 2018, weforum.org.

<sup>14</sup> Josh Bersin, *Rethinking the build vs. buy approach to talent*, General Assembly and Whiteboard Advisors, October 2019, joshbersin.com.

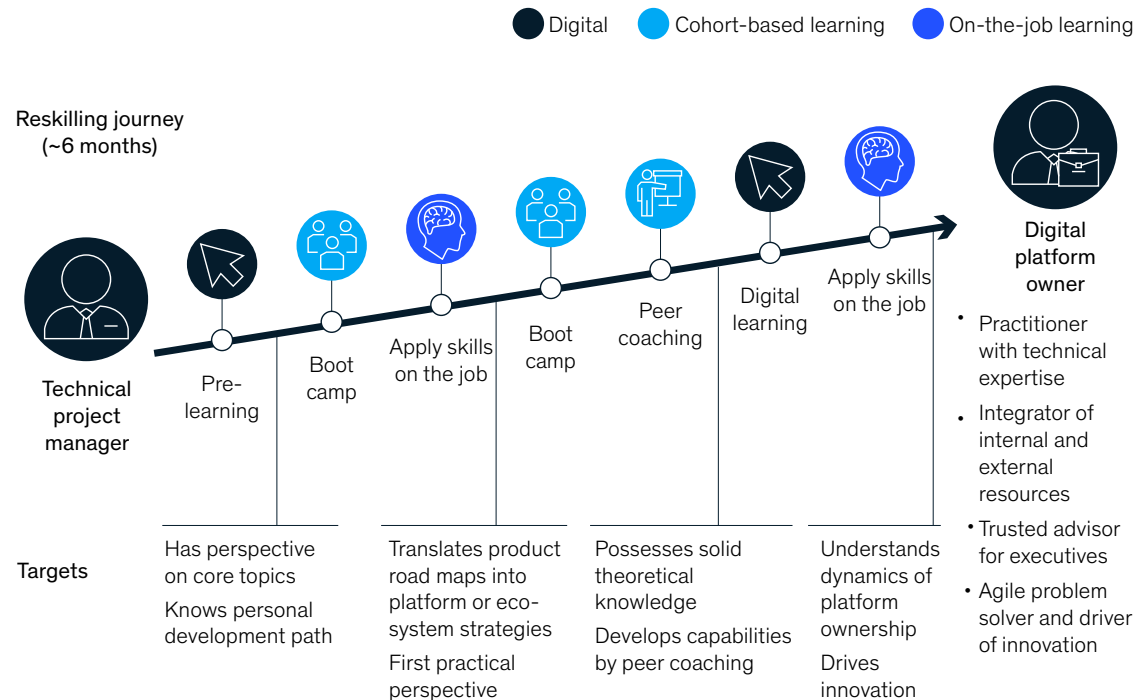
<sup>15</sup> Course overview of online learning providers Udacity and Coursera, 2020.

<sup>16</sup> Sapana Agrawal, Aaron De Smet, Sébastien Lacroix, and Angelika Reich, "To emerge stronger from the COVID-19 crisis, companies should start reskilling their workforces now," May 2020, McKinsey.com.

Exhibit

## Individual learning journeys are tailored to specific skills needs over a range of formats.

### Tech company example



### Learning needs to be a top management priority

The CHRO and CIO need to take joint ownership of a business's tech-training program. The most effective partnerships make sure that their training investments align with the company's overall strategy, establish a governance model with shared ownership among business leaders, continuously assess skills gaps, design targeted learning journeys, and integrate them into HR processes.<sup>17</sup>

### Don't forget your nontech employees

Nontech people need tech skills, too. With the continued importance of technology in driving business value, technology can no longer be

relegated to being an "IT thing." While people on the business side don't need to know how to code, they do need to learn how to better use technology. The continued democratization of data can also allow for "laypeople" to use data to make better and faster decisions without relying on complex IT processes.

Furthermore, CIOs often assume that only IT people can be reskilled and typically underestimate the possibility of reskilling employees from nontech departments. But increasing evidence shows that reskilling nontech people for tech roles can be effective (see sidebar "Even people without 'adjacent' skills can be successfully reskilled").<sup>18</sup>

<sup>17</sup> Jacqueline Brassey, Lisa Christensen, and Nick van Dam, "The essential components of a successful L&D strategy," February 2019, McKinsey.com.

<sup>18</sup> Coursera blog, "Learned code and switched careers as a developer," February 24, 2017, blog.coursera.org.

## Even people without ‘adjacent’ skills can be successfully reskilled

Skills adjacency is defined as the proximity between the skills required for two different jobs. Among students at Udacity,<sup>1</sup> a for-profit educational organization offering online technology courses, 67 percent showed high skills adjacency between their previous job and the one they found after completing their courses. Interestingly, however, a significant 33 percent found a new job with only medium or low skills adjacency, indicating that reskilling someone from a nontech role to a tech role can succeed (exhibit).<sup>2</sup>

Exhibit

### Reskilling can be successful even when skills adjacency is low.

		Type and length of reskilling			
	Driver	Front-end web developer	4 months; 5–10 hours learning/week	Software engineer	
	Mortgage-loan processor	Digital-marketing nanodegree	3 months; 10 hours learning/week	Digital marketer	
	Hospitality professional	Android-developer nanodegree	6 months; 10 hours learning/week	Android developer	

<sup>1</sup> McKinsey has a nonexclusive partnership with Udacity.

<sup>2</sup> Udacity data analysis, nonenterprise, private customers, n = 463, August 2020.

Given the rapidly changing nature of business and technology, companies will always be facing technology-skills gaps. But organizations that

are willing to dedicate the energy, focus, and resources to continually closing—or, in some cases, even leapfrogging—those gaps can win in the most important talent battlegrounds.

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