Shifts and Trends in Tech Talent Qualifications and Needs

Why job seekers might not need a college degree to land a tech job
According to the Bureau of Labor Statistics, employment of computer and information technology occupations is projected to grow 13 percent from 2016 to 2026, faster than the average for all occupations. Because this industry is growing so rapidly, employers are finding an increased skills shortage and less available talent, forcing them to think creatively about where to find candidates and how training can help bridge the gap.

So, how can job seekers break into this fast-growing industry? Are technology employers excluding people who have the right skills but no degree or an unrelated degree?

This report explores the hiring needs and challenges in the tech industry and identifies the industries and occupations that are seeing the most growth and the skills that applicants need to land a job.

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SECTION 1:  
THE STATE OF TECH HIRING IN 2018
Tech Roles Have Become More Difficult to Fill

Nearly half (49%) of tech hiring professionals find it more difficult to fill skilled technology positions than they did two years ago.

Of those who find it more difficult, a clear majority (82%) agree that the primary reason for this is a shortage of applicants who have the right skills or experience.

Many Tech Jobs Are Newly Created Positions

In the United States, technology employment expanded by nearly 200,000 jobs in 2017, to an estimated 11.5 million workers, according to the annual analysis by CompTIA. In fact, tech recruiters may find it more difficult to fill roles due to the amount of newly created positions.

Nearly half (45%) of tech hiring professionals agree that more than half of the technology roles their company hires for today did not exist at their company two years ago.
The percentage of technology roles their company hires for today that did not exist at the company two years ago:

- 16% (25% of roles or less)
- 39% (26-50% of roles)
- 45% (More than 50% of roles)

Looking to the Gig Economy to Fill Roles

According to a study by Brandon Hall Group, overall, contingent labor comprises less than one-fifth of the workforce in 76% of organizations, and one-tenth or less in 52% of organizations.

However, many companies are seeking more contingent talent to fill their tech roles. In fact, 74% of tech hiring professionals have increased their hiring of freelance or contingent technology workers in the past two years. The top reasons for turning to freelance and contingent workers are due to lower costs and more access to specialized skills and flexibility.

The Top Reasons Companies Have Increased Hiring of Freelance/Contingent Tech Workers:

- 35% Their salaries are more affordable
- 34% Their benefits are more reasonable or affordable
- 32% They have more diverse work experience
- 29% Their schedules are more flexible
- 27% They are easier to hire than full-time workers
The Gender Gap in Tech Hiring

iCIMS data provides a comparison of the percentages of males and females hired for technical positions across various industries. Overall, in these industries, males are leading the way with an average of 69% and females account for 31% of hires in tech.

iCIMS data is drawn from a database of more than 75 million applications and 3 million jobs posted per year by more than 3,500 customers worldwide.

Tech Hires - Male vs. Female

How Employers Find and Connect with Potential Tech Talent

Tech hiring professionals name applicant tracking systems (55%), development platforms (50%) and social networks (47%) as their top tools for recruitment and communications when seeking prospective technology candidates.

The top five ways that companies recruit and communicate with prospective technology candidates:

1. Their current applicant tracking system (ATS) – 55%
2. Development platforms, such as GitHub – 50%
3. Social networks, such as LinkedIn – 47%
4. Third-party sourcing platforms, such as Entelo – 44%
5. Text message and live chat-based recruiting software, such as TextRecruit – 34%
SECTION 2:
THE FASTEST GROWING INDUSTRIES AND OCCUPATIONS IN TECH
Your Next Tech Job May be in the Retail Industry

Those looking for their next opportunity in tech might want to consider a role in the retail industry. While there are fewer traditional retail positions, such as cashiers and sales associates, based on iCIMS data, the retail industry hired 79% more tech employees in 2017 compared to 2016 while manufacturing and financial activities hired 14% fewer.
According to iCIMS data, over the last two years, the following tech occupations experienced the greatest increases in hires.

**The Fastest Growing Tech Roles**

<table>
<thead>
<tr>
<th>Role</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data scientists</td>
<td>58%</td>
</tr>
<tr>
<td>Computer &amp; information research scientists</td>
<td>29%</td>
</tr>
<tr>
<td>Cyber/information security engineers</td>
<td>27%</td>
</tr>
<tr>
<td>Computer network support specialists</td>
<td>25%</td>
</tr>
<tr>
<td>Computer &amp; information systems managers</td>
<td>19%</td>
</tr>
<tr>
<td>Software developers, applications</td>
<td>8%</td>
</tr>
<tr>
<td>Information security analysts</td>
<td>6%</td>
</tr>
<tr>
<td>Computer user support specialists</td>
<td>4%</td>
</tr>
<tr>
<td>Network &amp; computer systems administrators</td>
<td>4%</td>
</tr>
<tr>
<td>Computer systems analysts</td>
<td>2%</td>
</tr>
</tbody>
</table>
SECTION 3:
THE SKILLS & COLLEGE MAJORS NEEDED FOR A CAREER IN TECH
The College Majors Most Likely to Lead to a Career in Tech

A technology degree remains the traditional entry point to a technology job. According to iCIMS data, the majority of those hired for technical roles in 2017 had a bachelor’s degree.

<table>
<thead>
<tr>
<th>Degree Level</th>
<th>Technical Roles</th>
<th>Non-Technical Roles</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Associate’s</td>
<td>9%</td>
<td>25%</td>
<td>24%</td>
</tr>
<tr>
<td>Bachelor’s</td>
<td>70%</td>
<td>63%</td>
<td>64%</td>
</tr>
<tr>
<td>Master’s</td>
<td>18%</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>Doctoral</td>
<td>3%</td>
<td>2%</td>
<td>2%</td>
</tr>
</tbody>
</table>

According to iCIMS data, college graduates who have various types of degrees achieved careers in the following popular tech jobs: data scientist, machine learning designer, cyber security engineer, and UX designer.

The following lists the types of degrees held by those who were hired for the above technology roles.

Data Scientist

The Most Popular STEM Majors:

- Mathematics
- Computer science
- Physics
- Statistics
- Engineering
- Industrial engineering & operations research
Machine Learning Designer/Developer/Engineer

- 66% STEM
- 21% Business
- 13% Arts & Humanities

The Most Popular STEM Majors:
- Computer science
- Computer engineering
- Remote sensing science & technology
- Engineering science
- Information systems
- Management science & engineering

Cyber/Information Security Engineer

- 56% STEM
- 21% Business
- 20% Arts & Humanities
- 3% Healthcare & Medicine

The Most Popular STEM Majors:
- Computer science
- Computer information systems
- Information systems audit & control
- Cyber security
- Information technology
Colleges Are Struggling to Make Students Marketable and Productive in the Workforce

With the rapid pace of today’s technological advancements, it’s become impossible to predict which skills will be the most useful in the industry a decade from now. Higher-education organizations may not be offering the courses and majors that will support the growing need for tech skills, creating a massive skills gap.

Tech hiring professionals agree – electronics and communications engineering (33%) and information systems (24%) are the least effective technology degrees at preparing students for a relevant job.
Tech recruiters and hiring managers say the following technology degrees are least effective at preparing students for a relevant job in their field.

- **Electronics and communications engineering**: 33%
- **Information systems**: 24%
- **Information technology**: 21%
- **Cybersecurity/network security**: 11%
- **Data science/analytics**: 10%
- **Computer science**: 8%
- **Software engineering**: 6%
- **Web design and development**: 6%
- **Computer engineering**: 5%
- **Network management**: 3%

Just over 3 in 5 (61%) tech hiring professionals agree – a four-year college degree in a technology-related field alone does not prepare job seekers to be successful in today’s workforce.

In addition, the vast majority (73%) of millennial hiring professionals are more likely to agree that a four-year degree alone is not adequate preparation for a tech-related position in the workforce compared to Gen Xers (53%) and boomers (59%).

Hiring candidates with non-traditional education backgrounds has become increasingly common in the tech industry. More than 2 in 5 (44%) tech hiring professionals note in the past year, less than 25% of their technology hires had a college degree in a related field. Surprisingly, only 25% of hiring professionals surveyed cite that 50% or more of their technology hires have a relevant college degree.

In contrast, older, more-established companies are less likely to change course if it isn’t strictly necessary. Companies that have been around more than 20 years hire a greater percentage of (42%) technology workers with degrees on average than those that have been established for 20 years or fewer (30%).
The Skills That Tech Recruiters Look For

To remain competitive in the job market, those with four-year college degrees must increase their marketability by adding training and certification. According to tech hiring professionals, DevOps (57%) and cloud computing/software as a service (25%) as the most important experiences that technology job candidates should have.

The most important skills and knowledge experiences that technology job candidates should have today:

- DevOps - 57%
- Cloud computing/software as a service (SaaS) - 25%
- Cybersecurity - 9%
- Blockchain technology - 9%
- Artificial intelligence (AI) or applied machine learning - 8%
- User Interface (UI) or User Experience (UX) design - 7%
- Augmented reality (AR)/virtual reality (VR) - 7%
- Mobile app development - 4%
- Data analytics - 4%

According to hiring professional in the tech industry, the following factors are most important when evaluating technology job candidates:

- Work samples - 20%
- The field in which they received their degree - 16%
- The school from which they received their degree - 16%
- On-site or online tests or assessments - 15%
- Reputations of previous employers - 12%
- References or recommendations - 11%
- Specialized training or certifications - 11%
SECTION 4: THE RISE OF NEW COLLAR JOBS AND SKILLS-BASED HIRING
Companies Are Open to Hiring Tech Candidates Without a College Degree

Historically, U.S. workers have defined job types as either white or blue collar. Seeing a widening skills gap and increased demand for tech talent, IBM CEO Ginni Rometty coined the term “new collar jobs” to describe occupations that focus more on a candidate’s skills rather than education level. Given that the average student loan debt for members of the class of 2017 is $39,400, the concept of new collar jobs provides an alternative to expensive, four-year college degrees and enables employers to redefine job qualifications.

Today, eager to fill tech positions, companies are increasingly looking for candidates with a particular set of skills but not necessarily a four-year college degree. In fact, an overwhelming majority (96%) of technology hiring professionals agree that over the past two years, it has become more acceptable to hire technology candidates who have alternative qualifications, including coding boot camps and certification courses, rather than a four-year degree.

A high-tech job used to require a higher-education degree, but recruiters and hiring managers from younger generations are rejecting that notion as a necessity.

Millennials are more likely to strongly agree (45%) that it has become more acceptable to hire technology candidates who have alternative qualifications rather than a four-year degree than are Gen Xers (33%) and boomers (30%).

More Tech Jobs Emphasize Skills, Not College Degrees

People with non-traditional backgrounds are becoming valuable to the tech industry. In fact, more than 2 in 5 (45%) tech hiring professionals agree that in the next two years, a coding boot camp will be as meaningful a qualification for skilled technology jobs as a college degree.

When companies have positions to fill, hiring new collar workers enables companies to be nimble, filling gaps in technology areas as they arise. The trend toward valuing training and certification more than degrees will continue to grow, as large corporations invest in such initiatives. For example, in 2017, Microsoft announced a grant of more than $25 million to help Skillful, a program that fosters skills-oriented hiring, training and education.
But What About the Money?

The need to fill new roles has prompted change throughout the tech industry, empowering new collar workers at the negotiating table.

The Tech Positions with the Highest Entry-Level Salary

Nearly 1 in 5 (19%) tech hiring professionals agree that software developers are offered the highest salaries at an entry level followed by user experience/interface designers (18%) and DevOps engineers (17%).

In fact, 80% of hiring professionals would offer tech candidates the same salary regardless of whether they had a relevant degree.
ABOUT iCIMS HIRING INSIGHTS

iCIMS Hiring Insights is an online resource for labor market insights and hiring trends. Our team of researchers and writers uses iCIMS’ exclusive data, as well as proprietary and secondary research, to create reports and articles that cover the most recent developments in the workforce. Featuring iCIMS’ Chief Economist, Josh Wright, iCIMS Hiring Insights helps its readers stay well-informed about the latest in recruiting, technology and the labor market. To learn more, visit: www.icims.com/hiring-insights.

SURVEY METHODOLOGY

This survey was conducted among 400 technology hiring managers and recruiters between July 6 and July 13, 2018, using an email invitation and an online survey.

ABOUT iCIMS DATA

iCIMS data is drawn from a database of more than 75 million applications and three million jobs posted per year by 3,500+ customers. iCIMS customers represent a broad swath of the U.S. economy, with expansive geographic, industry and occupational representation.