Creating a 21st Century Workforce
Apprenticeships

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CompTIA
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Overview

The technology industry depends on a bright and skilled workforce. Indeed, our industry’s greatest assets are the dedicated and skilled employees who are committed to the continued innovation, global competitiveness, and growth of the companies they work for and the American economy. Unfortunately, too many technology jobs remain unfilled. These open jobs are untapped potential. The global technology industry is expected to grow to $3.5 trillion by the end of 2017, and yet it is anticipated that there will be 1.8 million unfilled technology jobs in the United States by 2024.¹ Policymakers must explore a broader agenda to upskill American workers if the United States is to enjoy these economic benefits.

To date, the policies around educating the workforce of the future have centered largely on traditional workforce pathways like four-year college STEM programs. These and other graduate-level STEM programs play a key role in helping to shrink a skills gap – the variance between the performance employers desire from their workforce and what workers can or choose to deliver. Nevertheless, such an avenue should be viewed as just one piece of a broader workforce agenda. There are an increasing number of technology jobs that do not necessarily require a four-year degree, including web development, mobile application development, data administration, computer support specialists, and network support specialists to name just a few examples.² These are lucrative and critically important careers in today’s digital economy. As the economy continues to move in this direction, it is important to explore other avenues to educate American workers.

There are multiple pathways to a tech career. For example, industry-recognized certifications are portable and stackable, allowing an individual to validate in-demand skill sets by employers. Early College STEM programs allow high school students to simultaneously secure their diplomas, associate’s degrees and IT industry certifications, while gaining industry mentorship and experience. Programs that offer experiential training and earn-and-learn opportunities help to bring talent into the pipeline and teach the essential skills that are needed for the technology workforce to expand and remain globally competitive.

Apprenticeship programs are an under-utilized but compelling pathway to help fill those jobs that do not require four-year college degrees and shrink the skills gap. They quickly train and prepare workers for jobs within the technology industry and for many outside the industry. The widespread promotion and adoption of apprenticeship programs would benefit American workers, businesses, and our economy.

The second piece of our three-part series on the workforce, this paper focuses on strengthening the technology workforce through investments in apprenticeships. The first part of our series covered immigration reform policies and why the immediate need for access to the global talent pool is vital to achieve a 21st century technology workforce. The forthcoming third, and final, paper will cover the need for policies to improve STEM education initiatives across all levels.
To fully understand the scope of the issue, it is important to distinguish between technology industry employment and technology occupation employment. The technology industry workforce consists of anyone employed by technology companies. On the other hand, technology occupations are filled by those technology specialists who work in adjacent industries like healthcare, finance, media, government, etc. In 2016, for example, there were nearly seven million workers employed in the U.S. technology industry, while another seven million Americans were employed in technology-related fields in other industries.3

The technology industry – both domestically and abroad – is rapidly growing. Last year, there were 182,220 new jobs added by the industry in the United States, helping to make ours one of the strongest IT industries in the world.5 The IT industry in the United States represents 28 percent ($1 trillion) of the world’s $3.4 trillion IT industry.6 To put into perspective, the gross output of the technology sector exceeds that of the legal services industry, the automotive industry, the airline industry, the motion picture industry, the hospitality industry, the agriculture industry and the restaurant industry, to name just a few examples.
Not only does this industry and the workforce that supports it provide a significant boost to the U.S. economy, but the jobs themselves are strong, good-paying jobs, with the average annual salary hovering around $110,000.7

But even against this backdrop, there continues to be a significant gap between the technology jobs available and those who are skilled and equipped to fill those positions. In the last quarter of 2016, there were more than 626,000 of postings for tech occupation job openings – a trend that has remained fairly constant within the industry over the past few years.8

The workforce is also facing significant retirements in the near-term. Approximately 800,000 retirements are expected within the workforce by 2024, a staggering statistic when coupled with the increasing number of open positions.9

Of course, the technology workforce is evolving to meet new industry demands, growth, global competition, and rapid innovation. As the industry will experience more automation, a well-trained workforce is needed now more than ever.

These challenges and growth opportunities call for a modernized workforce that has access to the experiential training that builds and enhances the skills that are increasingly required in today’s workplace.
New Marketplace Demands

Policymakers across the board have traditionally looked to STEM undergraduate degrees and graduate degrees as the policy solution best suited to shrink the skills gap. Indeed, these degrees play a critical role in our ecosystem. However, a “one size fits all” model is not the most optimal method to shrink the skills gap and spur economic growth. Many technology careers do not require a four-year degree, let alone a graduate degree. Creating a pipeline that goes well beyond the traditional policy model is important for the long-term success of the technology industry and growth of the economy.

Half of the STEM jobs that are currently open are available to workers without a four-year degree, which highlights that policy solutions should be competency-based, not time-based. This translates to open positions that need specific skills, like developers, computer support specialists, and programmers – many of which do not require a four-year degree.

Several of the growth sectors within the technology industry – Internet of Things (IoT), cybersecurity, and emerging technology – are increasingly in need of a workforce that could benefit from innovative training options that don't require advanced degrees. Therefore, policy solutions should meet the demands of students and industry to expand opportunities for those not seeking four-year degrees as an important addition to current policies focused on undergraduate and graduate degrees.
Apprenticeships as a Policy Solution

Graduates of apprenticeship programs hit the ground running when they start a job. The skills developed during their education prepare apprentices for the jobs they will actually do. As a result, they are more productive at the outset and tend to be more loyal to the employer.

– Secretary Alexander Acosta, U.S. Secretary of Labor

Shrinking the skills gap requires training opportunities that create technology career pathways in the near-term and help build a lasting pipeline to grow the workforce over the long-term. Apprenticeships are one common sense solution to create a stable, predictable, and skilled pipeline of American workers, and are equally beneficial to the employee and employer. Apprentices work alongside industry experts in a real work environment, acquiring practical skills that can transfer to the workplace and, notably, are compensated. The ability to earn an income while obtaining hands-on experiences can make apprenticeships alluring, especially to non-traditional students like displaced workers or those pursuing a career change.

Apprenticeships can also help put a face on the technology industry. Too many American workers are reticent – or lack the confidence – to take on a job in the technology industry for fear of having to learn new skills or simply because they do not see people who look like them working in the industry. However, apprenticeships could help to reverse this trend, bridge the “confidence gap,” and grow the talent pool by giving workers the chance to potentially learn from someone like themselves – someone who shares a similar background, career pathway, or was similarly fearful of having to learn new skills at one time.

On the other hand, employers enjoy apprenticeship benefits as well. An employer may compensate an apprentice at a lower rate than a full-time employee, and importantly, witness in real time how an apprentice handles his or her tasks.

There is little doubt that apprenticeships are a net positive for workers and employers and should be adopted on a more widespread basis across all industries. Unfortunately, many technology-based businesses are hesitant to take part in apprenticeships because they view them as tools for other industries, as lasting too long (some apprenticeships can last up to six years), or find the reporting requirements that the Department of Labor requires for registered apprenticeships as too burdensome. Workers, too, have not flocked to apprenticeships, echoing the sentiments surrounding the length of apprenticeships and being designed for other traditional trade industries like construction or manufacturing. In fact, 2.1 million Americans participated in apprenticeships in 2016, but fewer than half of them were registered through the Department of Labor, and just a fraction were technology-related.

Apprenticeships are not a new policy solution, but some targeted reforms may be necessary to scale these programs within the technology industry.
The demand for skilled tech workers has never been greater, and with each new year, it continues to increase. Many tech employers now refer to certain technical skills—such as computer programming—as a trade. Apprenticeship programs represent an important workforce development tool that can provide the skills, training, and on-the-job experience necessary for people to access and maintain careers in tech.

– Skip Newberry, President and CEO, the Technology Association of Oregon

Since taking office, President Donald Trump has been particularly interested in on-shoring jobs and upskilling American workers to fill those jobs. In July, President Trump issued an executive order that created the Taskforce on Apprenticeship Expansion, which will examine and provide recommendations around several core policy areas:

• Federal initiatives to promote apprenticeships;
• Administrative and legislative reforms that would facilitate the formation and success of apprenticeship programs;
• The most effective strategies for creating industry-recognized apprenticeships; and
• The most effective strategies for amplifying and encouraging private-sector initiatives to promote apprenticeships.

The technology industry is well-positioned for the widespread adoption of apprenticeships, but existing programs need to be reformed for them to be effective for industry and future employees.
CompTIA’s Policy Recommendation: The CHANCE in Tech Act

Our economy is changing, and we must prepare our current and future workforce for the jobs of the 21st Century. This bill will allow industries, academic institutions, vocational and technical schools, and workforce development programs across the country to form partnerships and train Americans for the new economy.

– Representative Seth Moulton, D-Mass.

The next 100 years will be defined by our ability to compete in the technology sector and the CHANCE in Tech Act will help the United States remain the global leader in technological developments.

– Senator Cory Gardner, R-Colo.

Beginning in late 2016, CompTIA began work with a bipartisan, bicameral group of policymakers to build the Championing Apprenticeships for New Careers and Employees in Technology Act (CHANCE in Tech Act, S. 1518/H.R. 3174) – a legislative solution to address the growing need for apprenticeships within the technology industry. The proposal, similar to the Apprenti model in Washington state, would help forge public-private partnerships to serve as intermediaries between employers participating in the registered apprenticeship program, industry partners, training partners, and government entities. Each intermediary would assess and train potential apprentices in coordination with local and regional workforce demands in fewer than 18 months. The intermediaries would lessen the regulatory burden on participating employers by tracking success indicators and managing other reporting requirements. Finally, the CHANCE in Tech Act would also establish a program to recognize those high schools providing exemplary IT training and counseling.

The CHANCE in Tech Act has all the right components to be very beneficial in helping shrink the skills gap. The focus is on experience-based learning, which is exactly what this movement needs. What a lot of people don’t realize is that you don’t necessarily need a typical college education to fill these jobs. What these tech jobs really require is a base of computer science knowledge and experience in the field. This act will cater to those requirements and jumpstart the effort to close the gap.

– Ryan Weber, President, KC Tech Council

The CHANCE in Tech Act will ensure that quality candidates are recruited and provided with compressed and targeted training to meet specific employer needs including hard and soft (interpersonal) skills. The proposal will provide an avenue for private-sector entities like state technology associations, trade associations, businesses, and others, to help align curricula to ensure apprentices are armed with the correct skillsets, while eliminating hurdles that have prevented widespread industry adoption in the past.
Opportunity Costs of the Skills Gap

A skills gap in any industry hamstrings the its ability to compete, innovate, and grow. The technology industry’s skills gap is especially significant considering the industry’s growing influence in the broader economy.

According to recent polling, of the top five factors contributing to a more challenging hiring landscape in 2017, three of them are “finding workers with expertise in emerging tech fields”, “finding workers with the right soft skills,” and “an insufficient pool of talent in the region.” And, alarmingly, more than half (53%) of IT professionals surveyed cited the need for additional training and professional development opportunities.

TOP 5 FACTORS CONTRIBUTING TO A MORE CHALLENGING HIRING LANDSCAPE IN 2017
#1 - Finding workers with expertise in emerging tech fields
#2 - Competing with other tech firms for talent
#3 - Finding workers with the right soft skills
#4 - Rising salary expectations
#5 - Insufficient pool of talent in region / locale

As this data provides a clear argument that the skills gap exists, the effects of the skills gap are equally staggering. For example, 43% of IT professionals surveyed cited the availability of skilled workers as a growth inhibitor to their businesses (increasing 13 percentage points year-over-year). At the same time, the U.S. is expected to have 1.8 million unfilled technology jobs by 2024 because the skilled workers simply do not exist at a rate to keep up with industry growth.

The adjacent effects are significant as well. One job in the high-tech industry creates 4.3 jobs in local goods and services industries. Furthermore, competitors overseas – especially India and China – are bolstering their own workforce and advancing policies to ensure they maintain and attract top talent within their technology sectors.

The number of open technology positions and the polling data highlighting the need for more skilled workers clearly show growth as a key factor when considering the impacts of the skills gap. However, the effects reach far beyond growth, alone. The technology industry is one of the most competitive in the world and success largely depends on the ability to innovate around consumer demands and respond to emerging trends – all of which relies exclusively on a bright and nimble talent pool. A workforce that is outmoded provides a significant hurdle to remaining competitive in such a rapidly evolving global marketplace. Additionally, adjacent industries, including national security, will continue to be squeezed should the skills gap persist or grow.
Conclusion

The American economy faces a skills gap that is not only affecting jobs within the technology industry, but also those technology jobs in adjacent industries throughout the economy. Policy trends favor solutions that focus on four-year undergraduate and graduate degrees. While these degrees do help shrink the skills gap among the highest-skilled workers, they unfortunately fail to address the increasing number of technology careers that do not require traditional college degrees.

As policymakers work to upskill Americans, they should broaden their agenda to encourage more employers and workers to participate in apprenticeships. Apprenticeships can help to build a diverse, robust and sustainable talent pipeline that benefits employers and employees alike. They can personalize learning, helping workers to bridge a confidence gap that they too can pursue lucrative careers alongside mentors who may share similar personal and professional experiences.

References

4. Ibid.
5. Ibid.
8. Ibid.