



May 13, 2024

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Employment and Training Administration
Department of Labor
200 Constitution Avenue, NW, N-5311
Washington, DC 20210

Brent Parton
Principal Deputy Assistant Secretary
Employment and Training Administration
U.S. Department of Labor
200 Constitution Avenue, N.W.
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VIA ONLINE SUBMISSION

Re: Comments of Engine Advocacy on Modernizing Schedule A To Include Consideration of Additional Occupations in Science, Technology, Engineering, and Mathematics (STEM) and Non-STEM Occupations; Docket No: ETA 2023-0006; RIN 1205-AC16

Dear Administrator Pasternak and Principal Deputy Assistant Secretary Parton,

Engine is a non-profit technology policy, research, and advocacy organization that bridges the gap between policymakers and startups. Engine works with government and a community of thousands of high-technology, growth-oriented startups across the nation to support the development of technology entrepreneurship through economic research, policy analysis, and advocacy on local and national issues. We are commenting in response to the Department of Labor's request for information regarding the modernization of Schedule A. There are persistent talent shortages in critical and emerging technologies that negatively impact the ability of startups to hire needed talent and we accordingly appreciate the opportunity to provide feedback from the perspective of the startup ecosystem.

I. Introduction

Startups are the drivers of U.S. innovation and job creation, with young startups creating jobs at higher rates than older companies.¹ And while the U.S. startup ecosystem is arguably the most successful and dynamic in the world, pain points in acquiring talent often hold back startups as they compete for the best and brightest talent with larger, established companies. At the same time, the U.S. startup ecosystem has achieved much of its success and dynamism through the dedication and contributions of immigrants—but not because of the U.S. immigration system, rather in spite of its challenges. More than half of unicorn startups—those valued at more than \$1 billion, have been founded or co-founded by immigrants.² STEM degree paths in U.S. universities are dominated by international students,³ where they make up 45 percent of U.S. advanced STEM degree graduates,⁴ and 70 percent of full-time graduate students in AI-relevant fields.⁵ And immigrant talent continues to fill gaps in industries across the U.S.—reports indicate 1 out of 5 STEM workers in 2021 were immigrants.⁶

U.S. policymakers have acknowledged the role and need for high skilled foreign talent. Senators Hickenlooper, Cramer, Manchin, and Rounds have called on the DOL “to use its Schedule A Shortage Occupation list as a tool to address the workforce shortages our country is facing in critical high-skill industries, including Science, Technology, Engineering, and Math occupations (STEM) and professional healthcare occupations.”⁷ The administration’s broad artificial intelligence (AI) executive order calls to “[u]se existing authorities to expand the ability of highly skilled immigrants and nonimmigrants with expertise in critical areas to study, stay, and work in the United States by modernizing and streamlining visa criteria, interviews, and reviews,”⁸ including through possible updates to the Schedule A list of occupations.⁹ Additionally, while Congress passed and the President signed the CHIPS and Science Act, which will spur domestic microchip production over

¹ Christopher Goetz and Martha Stinson, *U.S. Startups Create Jobs at Higher Rates, Older Large Firms Employ Most Workers*, U.S. Census Bureau (Feb. 16, 2022), <https://www.census.gov/library/stories/2022/02/united-states-startups/create-jobs-at-higher-rates-older-large-firms-employ-most-workers.html>.

² Stuart Anderson, *Most Billion-Dollar Startups In The U.S. Founded By Immigrants* (Jan. 26, 2022), <https://www.forbes.com/sites/stuartanderson/2022/07/26/most-us-billion-dollar-startups-have-an-immigrant-founder/?sh=5acbc6b36f3a>.

³ Esther Brimmer, *Remarks by Esther Brimmer to a Workshop Convened by the National Academies of Science, Engineering and Medicine*, NAFSA (Nov. 18, 2022), <https://www.nafsa.org/blog/international-stem-talent-and-us-research-competitiveness>.

⁴ Anna Shepperson, *The Success of the CHIPS Act Depends on Skilled Immigrants*, Immigration Impact (Aug 2, 2023), <https://immigrationimpact.com/2023/08/02/chips-act-needs-immigrants/>.

⁵ Stuart Anderson, *AI and Immigrants*, National Foundation for American Policy (June 2023), <https://nfap.com/research/new-nfap-policy-brief-ai-and-immigrants/>.

⁶ Shepperson, *supra* note 4.

⁷ See letter from Sens. Hickenlooper, Cramer, Manchin, and Rounds, available at: <https://senatorkevincramer.app.box.com/s/3njtr1yz3xzt12hltqxaci4fw4fn38p0>.

⁸ The White House, *Fact Sheet: President Biden Issues Executive Order on Safe, Secure, and Trustworthy Artificial Intelligence* (Oct. 30, 2023), <https://www.whitehouse.gov/briefing-room/statements-releases/2023/10/30/fact-sheet-president-biden-issues-executive-order-on-safe-secure-and-trustworthy-artificial-intelligence/>.

⁹ The White House, *Executive Order on the Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence* (Oct. 30, 2023), <https://www.whitehouse.gov/briefing-room/presidential-actions/2023/10/30/executive-order-on-the-safe-secure-and-trustworthy-development-and-use-of-artificial-intelligence/>.

the coming years, it requires a significant amount of highly skilled talent the U.S. is not yet equipped to supply.¹⁰ Reports indicate that to achieve the goals of the legislation would require an additional 237,000 workers in the semiconductor industry.¹¹ In short, bipartisan policymakers have stressed the importance of U.S. dominance in emerging technologies but have done little to generate the needed talent supply.

Modernizing Schedule A is a step toward the goal of maintaining a leading innovation ecosystem that is competitive globally. The pathways to come to the U.S. as high-skilled talent are exceedingly limited, and often are accompanied by significant processing times and backlogs—a prevailing wage determination and the Program Electronic Review Management (PERM) process itself can take up to 24 months.¹² Because of the uncertainty associated with, and delays common in, our immigration system, talent is ultimately often driven to other countries.¹³ Though this effort would not increase the number of immigrants eligible for green cards or that are able work in the U.S., it would allow needed talent to be more quickly and efficiently deployed in response to skills shortages in support of critical industries, helping to open up the broader talent pool for startups, and allow the DOL to more effectively use its resources. As Congress remains hopelessly deadlocked on immigration reform priorities for the innovation ecosystem, the DOL can take a needed first step to modernize the Schedule A list of shortage occupations, which would reduce costs for employers, including startups, and provide them greater certainty. And easing the onerous processing times associated with the PERM process by adding and pre-certifying critical fields to the shortage list ensures DOL continues to carry out its directive to protect U.S. workers.

II. Startups rely on a robust talent pool to innovate

After access to capital, confronting talent decisions, including who, how, and when to hire, is often the biggest challenge a startup will face. Startups rely on highly skilled talent, often in STEM fields, like data scientists, engineers, and developers to build out their platforms, services, and products. But these individuals are not in infinite supply—and the largest technology companies are often in competition for the same talent, as is the federal government. The most successful seed stage startups on average have just \$55,000 per month for all expenses, including talent.¹⁴ And early stage startups often craft compensation packages with equity, to reward talent as companies grow. With such limited talent pools for needed skills, startups are often unable to compete with larger, established companies with more traditional compensation packages. But as we stated, startups are drivers of U.S. innovation—without streamlined access to the high-skilled talent they need,

¹⁰ Shepperson, *supra* note 4.

¹¹ *Id.*

¹² Sophie Alcorn, *What Changes are in Store for PERM* (Jan. 3, 2024), <https://techcrunch.com/2024/01/03/ask-sophie-what-changes-are-in-store-for-perm/>.

¹³ Stuart Anderson, *U.S. Immigrant Entrepreneurs Also Lured to Canada*, *Forbes* (Sept. 14, 2023), <https://www.forbes.com/sites/stuartanderson/2023/09/14/us-immigrant-entrepreneurs-also-lured-to-canada/?sh=6260cbca3fa2>.

¹⁴ Engine, *State of the Startup Ecosystem* (April 2021), <https://static1.squarespace.com/static/571681753c44d835a440c8b5/t/60819983b7f8be1a2a99972d/1619106194054/The+State+of+the+Startup+Ecosystem.pdf>.

innovation will lag. And for startups located outside of technology hubs, including rural startups, acquiring needed talent is even more challenging, as talent pools are further shrunken.¹⁵

As the interest in AI and other emerging technologies continues to pick up steam, both in the public and private sectors, demand for relevant skills and talent will only continue to skyrocket, including amongst startups. Updating Schedule A to include critical STEM fields, or perhaps more importantly, STEM skills, enables innovative companies affected by skills shortages to more efficiently hire foreign-born experts and in turn grow their companies. Access to talent is integral for U.S. startups' growth—Startup Genome has found that “[m]any startups report that talented employees are critical to scaling, while the lack of suitable employees can be a major inhibitor.”¹⁶ And research shows that when startups are able to hire to best advance their companies, startup ecosystems thrive.¹⁷ Both of which lead to job creation that would benefit U.S. workers, and growth of an emerging AI sector that would benefit the U.S. global competitiveness.

III. Skills and talent shortages persist in critical and emerging technologies

U.S. policymakers have made a number of tech fields priorities for the government and for innovation, including AI and semiconductor manufacturing, but talent shortages threaten the efficacy of these efforts. As fwd.us indicated in examining U.S. competitiveness, “[t]op experts from many of the ‘industries of the future’ (like quantum information technology, artificial intelligence, climate technology, and biotechnology) warn that the United States’ ability to lead in these fields is being hindered by a diminished skilled workforce and barriers to recruiting top-tier talent from around the world.”¹⁸ For these industries—which are new, growing, and changing, the skills needs can be vast and can expand as they continue to develop—and they may not be explicitly tied to occupations that can be coded. For startups, who often are not in the position to hire extensively in their initial stages, hiring based on skills as opposed to occupation can be critically important to cover many talent needs.

The demand for STEM talent is plainly evident when analyzing the tech industry. According to a study by TechNet examining the skills gap which indicated the high productivity of the tech sector, “the estimated direct economic output of the tech industry is \$2 trillion, which accounts for 10.5 percent of the national economy, despite comprising only 7.9 percent of the labor force.”¹⁹ And according to feedback from technology companies, it has been challenging to staff their workforces with needed skills, indicating that roles in occupations like data science, cloud computing, and

¹⁵ Rieva Lesonsky, *Opportunities and Obstacles for Rural Entrepreneurs*, SCORE (Sept. 8, 2023), <https://www.score.org/resource/article/opportunities-and-obstacles-rural-entrepreneurs>.

¹⁶ Dr. Christopher Haley, *The Value of the Right Tech Talent*, Startup Genome (Oct. 13, 2023), <https://startupgenome.com/articles/the-value-of-the-right-tech-talent>.

¹⁷ *Id.*

¹⁸ Andrew Moriarty, *Strengthening America's Competitiveness and Security by Welcoming More Immigrants with STEM Skills*, fwd.us (April 26, 2023), <https://www.fwd.us/news/stem-immigrants/>.

¹⁹ TechNet, *Closing the Skills Gap*, <https://technetorg.app.box.com/s/4ein0h9wq9dkxxlhltxd6aoqcw9r4m5z>.

software development are challenging to fill.²⁰ The report further illustrates U.S. employers' concerns about skills gaps, showing one in four American employers has difficulty filling roles due to talent shortages and 64 percent of American employers indicating that their companies suffer from a skills gap.²¹

For emerging fields of AI, demand for talent is significant. According to reports from October 2023, “[t]he number of active job posts advertising openings in AI increased 22% in the three-month period ending on Oct. 11 from the prior three months.”²² Job site Indeed also reported high demand with respect to AI-related jobs in May of 2023, where “[d]ata scientist roles made up 5% of the AI job postings on Indeed's U.S. platform, while roles such as software engineer, machine learning engineer and data engineer were also in demand.”²³ And other sources indicate that in 2023, “machine learning job opportunities are nearly three times the level in 2018, while artificial intelligence jobs are around 1.5 times higher.”²⁴ While most would expect engineering to dominate the AI space, demand for data scientists has surged.²⁵ And other technology fields have experienced similar demands. According to a 2021 report from TechNet, “there are an estimated 250,000 computer science jobs available in the United States at all times, with almost five open jobs available for every software developer searching for work.”²⁶ The report further indicates that the DOL expects there to be “1.4 million jobs open in computer specialist fields in the near future, but based on current projections, American universities only produce enough skilled degree-holders to fill 29 percent of these positions.”²⁷

Salary data also reflects the demand for AI-related talent. According to one report, the average listed salary for an AI engineer is \$188,000.²⁸ And senior data scientist roles can offer salaries in excess of \$200,000.²⁹ Others report that in 2017, AI specialists for large technology companies could expect to earn between \$300,000 and \$500,000 in salary and stock, arguing that specialists can command such high salaries because “fewer than 10,000 people have the skills necessary to tackle serious artificial intelligence research.”³⁰ Although individuals have continued to gain relevant skills in the ensuing

²⁰ *Id.*; and, Ryan M. Sutton, *The Skills Gap in Tech Is Poised to Expand. Employers, What's Your Action Plan?*, Robert Half (Aug. 25, 2023), <https://www.roberthalf.com/us/en/insights/management-tips/the-skills-gap-in-tech-is-poised-to-expand>.

²¹ TechNet, *Closing the Skills Gap Report One Pager*, <https://technetorg.app.box.com/s/yd1scj2ifgt6bxac6b35i0n6k90kbg7>.

²² Emily Peck, *Jobs and Salaries for AI Engineer Roles are Surging* (Oct. 31, 2023), <https://www.axios.com/2023/10/31/ai-wage-premium-tech#:~:text=Driving%20the%20news%3A%20The%20number,Roger%20Lee%2C%20who%20started%20layoffs>.

²³ Chavi Mehta, *US-based generative AI job postings up 20% in May, Indeed data show* (June 2, 2023), <https://www.reuters.com/technology/us-based-generative-ai-job-postings-up-20-may-data-2023-06-22/>.

²⁴ *Number of AI Jobs Continue to Climb (September 2023)*, NiceMachineAI (Sep. 9, 2023), <https://medium.com/@NiceMachine/number-of-ai-jobs-continue-to-climb-september-2023-2f4eba3d1b95>.

²⁵ Morgan Smith, *The most in-demand AI job of 2023 can pay over \$200,000 and offers remote opportunities* (Nov. 2, 2023), <https://www.cnn.com/2023/11/02/the-most-in-demand-ai-job-of-2023-can-pay-over-200000-and-offers-remote-opportunities.html>.

²⁶ TechNet, *supra* note 19.

²⁷ *Id.*

²⁸ Peck, *supra* note 22.

²⁹ Smith, *supra* note 25.

³⁰ Cade Metz, *Tech Giants Are Paying Huge Salaries for Scarce A.I. Talent* (Oct. 22, 2017), <https://www.nytimes.com/2017/10/22/technology/artificial-intelligence-experts-salaries.html>.

years, average salaries advertised by companies and the dramatic increase in job postings in AI-related fields, indicate that demand continues to outpace supply.

IV. Determination of occupations to be included in Schedule A

At a minimum, the occupations which the government has indicated are of critical importance, including those relevant to the advancement of AI, the manufacture of semiconductors, and those identified as critical technologies,³¹ should be added to the Schedule A list. We also encourage the Department of Labor to not limit themselves to the narrowness of specific occupations themselves, but also consider skills shortages. Many fields reporting talent shortages are in new and emerging industries where myriad STEM skills are needed—and a broad view of what skills and professions are relevant to STEM industries should be taken. As we stated in comments to the Department of Homeland Security regarding the proposed modernization of the H-1B program:³²

At the core of the U.S. startup ecosystem is innovation—cutting edge solutions to the world’s toughest problems. Many of the startups in today’s ecosystem operate in new and burgeoning fields and interdisciplinary fields that may not have even existed just ten years ago. These fields that are only just in their nascent stages or have not yet been discovered may not even have clear, directly related degrees, with workers instead honing their necessary skills across a multitude of disciplines.

And the American Immigration Lawyers Association and the American Immigration Council indicated similar sentiments regarding new career fields when discussing specialty occupations—regarding data science:³³

This occupation did not exist 10 years ago but has developed as the next generation of the application and benefit of computer operations...As with computer science in the past, degree programs vary as many colleges and universities do not have data science departments. Students seeking the specialized knowledge required to enter this new occupation must take courses in a variety of academic departments. The knowledge for data science careers often requires expertise in statistics, applied mathematics, computer programming, and database operations. Students are graduating with degrees in such diverse fields as mathematics, engineering, statistics, or computer science in which they may have

³¹ *National Science and Technology Council, Critical and Emerging Technologies List Update* (June 2024), <https://www.whitehouse.gov/wp-content/uploads/2024/02/Critical-and-Emerging-Technologies-List-2024-Update.pdf>

³² See comments from Engine, available at: <https://static1.squarespace.com/static/571681753c44d835a440c8b5/t/6580c62f55a78374eeca39c/1702938159532/Engine+Modernizing+H1B+Requirements+Docket+No+USCIS+2023+0005.pdf>.

³³ See comments to the Trump Administration from the American Immigration Lawyers Association and the American Immigration Council, available at: <https://www.americanimmigrationcouncil.org/advocacy/comments-filed-address-substantive-flaws-proposed-h-1b-regulatory-changes>.

studied all of these fields. There is a body of highly specialized knowledge that must be acquired for this new occupation, but it may not be in a specific degree.

Those comments reflect a discussion of a different visa pathway, but only further underscores that many emerging and interdisciplinary fields require a number of skills across a variety of disciplines that may not directly line up with an identified occupation, given the “newness” of these fields.

It should be noted that in highlighting fields like artificial intelligence as critically important, talent that is already in limited supply will only further be restricted without action from government. Updating Schedule A means that critical talent would be accessible in a more predictable, timely fashion, allowing the U.S. to remain competitive, keeping needed workers from relocating to countries more friendly to immigration.³⁴

V. Methodology

We encourage the Department to determine labor shortages using an approach that incorporates both public and private sources of data that takes into account average salaries, job vacancies, and occupation-specific unemployment rates, as well as regular solicitation of public input. As technology rapidly advances, the skills in demand today may not be those in demand in ten years. And given that Schedule A has not been updated for some time, and the current list is far from reflective of today’s talent needs, consistent regular input is crucial.

VI. Conclusion

Thank you for your attention to this matter and efforts to make talent more accessible for all companies, including startups. We are happy to serve as a resource regarding the talent needs of the startup ecosystem and what role immigrant talent fills for startups building their teams.

Sincerely,

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³⁴ See coalition letter available at: https://www.americanimmigrationcouncil.org/sites/default/files/research/dol_update_schedule_a_occupation_list_to_meet_current_labor_market_needs_letter.pdf.