APPRENTi
The path, the plan, your career in tech.

1721 8th Ave N
Seattle WA 98109
206.707.0194

Testimony before Subcommittee on Higher Edication and Workforce Development March 27, 2019

Written Testimony before the U.S. House of Representatives,

Committee on Education and Labor, Subcommittee on Higher Education and Workforce Investment

Hearing Entitled "Innovations in Expanding Registered Apprenticeships"

Susan Davis. Chairman

March 27, 2018

Chairman Davis, Ranking Member Smucker and distinguished members of the committee, it is an honor to appear before you today at this important hearing on registered apprenticeship. By way of background, my name is Jennifer Carlson, I am the Executive Director and Co-Founder of Apprenti, a nationally recognized 501(c)3 non-profit and wholly owned subsidiary of the Washington Technology Industry Association (WTIA)– the trade association representing the needs of 1100 tech sector companies in the state of Washington. Apprenti is the U.S. Department of Labor Information Technology Sector Lead focused on development, implementation and expansion of registered technology apprenticeships in the United States.

CONTEXT

Our country is in the midst of a tech talent crisis. There is a shortage of trained talent for technology roles both within the tech sector and in other sectors that rely heavily on technology to remain cutting edge. While a four-year college degree is often thought of as a requirement for securing many of these roles, colleges and universities are not keeping up with the new talent demand from industry. At the close of 2018, there were roughly 2.97 million tech job postings in the U.S., while the country confers only 65,000 four-year computer science degrees and 250,000 total engineering degrees annually.[1,2] Of course, new graduates will not fill all open positions, but coupled with an aging workforce and forecasted tech growth, this gap suggests a meaningful disconnect between supply and demand.

As technologies evolve and automate, the skill level needed to meet our requirements increases. Entry level jobs like Quality Assurance, or testers, and Help Desk that were once good entry points to building a tech career are shrinking making the new entry point a middle skill level like Software Developer, Application Developer or Systems Administrator, which require significantly higher training. As hiring

[1] *Cyberstates.org*, CompTIA, 2018. "Tech occupations" are technical in nature and include roles outside of the tech sector (e.g., in healthcare, financial services, etc.).
[2] *Digest of Education Statistics*, National Center for Education Statistics, 2016. Total degree count includes Associate's, Bachelor's, Master's, and Doctor's degrees across STEM fields. Number is much lower for technology-specific degrees.

"middle skills" tech talent has become the greatest pain point for companies of all sectors, more are recognizing that a college degree may not be the best or only path to these jobs.

Apprenticeship – workforce training that combines technical instruction with paid "on-the-job" training at a company – represents a time-tested approach for supplying companies with the talent they need and workers with fulfilling careers that carry family-sustaining wages.

APPRENTI

Three years ago, the WTIA conducted a study which shed light on the pernicious diversity and talent gaps in Washington state tech sector. Based on the outcomes of that study, the WTIA decided to focus its efforts on a new training pathway that could address today's hiring needs in real time and launched Apprenti as a nationally Registered Apprenticeship (RA) program. A consortium of companies with hiring needs across the country including Microsoft, Amazon, F5 Networks, Premera Blue Cross, Russell Investments, and Accenture, evaluated several program design options and determined that Registered Apprenticeship is the best secondary talent development track to invest in due to:

- The success of this model for tech in other countries;
- The rigor and consistency of the registered model in the United States across other sectors;
- The certified completion of apprenticeship credential provided by the U.S. Department of Labor via industry established criteria
- The portability of both the classroom training and related tech certifications coupled with a completion of registered apprenticeship credential; and
    - Long-term industry strategy being that RA creates the ability for employers to accept qualified applicants with either a college degree, or completion of Registered Apprenticeship.
- Finally, per DOL regulations, the requirement that apprenticeship is a job. This lone requirement means that investment is made only in those with a guaranteed employer sponsor willing to train a person for the minimum one-year term. Employers are thus training to retain this new talent into planned headcount.

These companies identified the most critical "middle skill" jobs, – defined as jobs with potential for upward mobility that traditionally would have required a college degree – as the highest impact area for apprenticeship. Since then, Apprenti has outlined 13 "middle skill" tech roles it can fill with diverse populations based on *competency over pedigree*.

After receiving the American Apprenticeship Initiative Grant from DOL, Apprenti launched its first cohort of apprentices in November, 2016, and has since pushed to market over 40 additional cohorts for over 400 apprentices across 11 states with 30 employers. 2019 will see an additional 20 employers, and 3 new states, totaling roughly 1,000 apprentices.[3]

Apprenti's role as the sector's intermediary has grown to meet industry's needs: screening and delivery of diverse talent, identification of technical training resources on behalf of employers, program compliance, apprentice registration and standards holder, joint apprentice management and sourcing of public/private resources. As a hybrid time and competency-based Registered Apprenticeship model straddling the High

Tech, Financial Services, Healthcare and Retail sectors and have been successful in achieving diversity with women and minorities comprising 66% of placements and veterans 64%.

Outcomes are critical: Income data suggest the program is delivering value for apprentices and return on investment for states and the federal government. The apprentices served to date have moved from median annual pre-program earnings of $29,000 with 22% unemployed on entry, to median apprenticeship earnings of $51,000 plus benefits, and median retained earnings on completion and final placement of $75,000. Not only does this reflect a 155% jump in earnings from pre to post-apprenticeship in roughly eighteen months, but also improved lifetime earnings greater than $1,000,000 per apprentice.[4] Early retention figures have also been strong with 84% of those completing apprenticeships being retained.[5]

Our apprentices come from every walk of life, teachers, Uber drivers, warehouse workers, pharmacy technicians and return to work moms. Our youngest placed is 18 and eldest is 63. One of our earliest apprentices was working as a furniture truck delivery driver, with an Associate's degree in computer science. After applying for hundreds of jobs in tech, he had no interviews because he had no experience. After graduating from his apprenticeship as a web developer, he is now one of many in our program making a six-figure income and is the leader of his development team.

CONCLUSION

Companies invest an average of $80,000 per apprentice in salary, benefits and tuition subsidy for technical training. We appreciate the investment made to date by the U.S. Department of Labor in our expansion and supporting the sector's talent development needs. Focusing additional federal investment in scaling successful programs like ours can move tech from thousands to tens of thousands of apprentices.

Tying that support to conforming standards of apprenticeship, and focusing on outcome metrics like improved earnings, retention, and diversity ratios, combined with policy support, would build sector confidence and sustained adoption of apprenticeship as a secondary talent development system. Policies could include:

- Codifying into law the current regulations defining a "Registered Apprenticeship" would reduce brand confusion, create clear guidelines around its use and meaning, and establish accountability for use in training subsidies.
- Create a sustainable, annual, >$250M Federal fund that states can match to support the classroom (RSI) training costs of developing apprentices in non-traditional sectors.

Thank you and I will do my best to address any questions that you have.

---

[3] Current states operating in: Washington, Oregon, Louisiana, Michigan, Massachusetts, Tennessee, Ohio, Texas, Virginia, Georgia, Illinois. Expanding to California, Utah & Arizona with others in development. Hawaii is a veteran training only location.

[4] Median age of 32 in program, forecasting 20-year tech career, at known $50k per year of improved income is $1.0MM excluding salary increases, promotions.

[5] 84% retention represents Apprenti's first five cohorts. Apprenti's long-term, steady state expectation is 80% retention within sector.

Appendix: Apprenti Overview
March 27, 2019

"We need to prepare our young people for the workforce of tomorrow, investing in areas such as STEM education and in creating apprenticeships as paths to career readiness. And these apprenticeships can be accredited and validated as true educational vehicles… Companies are great universities for educating the workforce of the future…"

- Marc Benioff, Chairman and CEO, Salesforce.com[3]

CONTEXT

Our country is in the midst of a tech talent crisis. There is a shortage of trained talent for technology roles both within the tech sector and in other sectors that rely heavily on technology to remain cutting edge (e.g., healthcare, financial services). While a four-year college degree is often thought of as "table stakes" for securing many of these roles, colleges and universities are not keeping up with the new talent demand from industry. In 2017, there were roughly 2.8 million job postings for tech occupation jobs in the U.S. standing vacant at the close of the year, while the country confers only 65,000 four-year computer science degrees and 250,000 total engineering degrees the prior year.[4,5] New graduates will not fill all open positions, and coupled with an aging workforce and forecasted tech growth, this gap suggests a meaningful disconnect between supply and demand.

This crisis should be no surprise given the pitfalls of American higher education. Only 46% of recent high school graduates enroll in four-year institutions, with an additional 24% enrolling at two-year institutions.[6] For those who enroll in college, degree completion rates are low; only about 60% of students at four-year institutions and 30% of students at two-year institutions complete their degrees in 150% of the planned duration or less.[7] Even those who earn degrees are often under-prepared for the world of work; only half of managers say that recent college graduates are adequately prepared for their jobs.[8] On top of low enrollment, completion risk, and questionable preparation, the high (and rising) cost of post-secondary education leaves many students struggling with debt for years and can be a disincentive from pursuing a college degree.

To make matters worse, higher education outcomes vary dramatically by race, exacerbating inequities in economic outcomes. Black and Hispanic students are much less likely to graduate on-time than white students.[9] Historically, disparities in post-secondary outcomes have directly translated into disparities in workforce opportunities, including limited access to tech careers. While studies show minorities account for 15% of the high-tech workforce, compared to 28% of the workforce across all private industries, tech

[3] Benioff, Marc, *"We must ensure the Fourth Industrial Revolution is a force for good"*, World Economic Forum, 2017.
[4] *Cyberstates.org*, CompTIA, 2018. "Tech occupations" are technical in nature and include roles outside of the tech sector (e.g., in healthcare, financial services, etc.).
[5] *Digest of Education Statistics*, National Center for Education Statistics, 2016. Total degree count includes Associate's, Bachelor's, Master's, and Doctor's degrees across STEM fields. Number is much lower for technology-specific degrees.
[6] Ibid.
[7] Ibid.
[8] *"Workforce-Skills Preparedness Report"*, PayScale, 2016.
[9] *Digest of Education Statistics*, National Center for Education Statistics, 2016.

sector executives state blacks, Hispanics and those of mixed race represent less than 5% of the high-tech workforce.[10] Conventional pathways into high-paying, high-growth tech roles have not served a diverse population well.

The experience of other countries suggests there is a better way. Apprenticeship – workforce training that combines technical instruction with paid "on-the-job" training at a company – represents a time-tested approach for supplying companies with the talent they need and workers with fulfilling careers that carry family-sustaining wages. European countries such as Austria, Germany and Finland have long incorporated apprenticeship into their education systems at scale (50% to 70% of high school students enter into apprenticeships) with impressive results, including in so-called "white-collar" industries.[11] Across industries, apprenticeship in these countries provides access to robust, long-term career ladders; as a notable example, the new CEO of Deutsche Bank launched his career with an apprenticeship, in lieu of pursuing a college degree, at the same company.

There is also evidence from the U.S. that apprenticeship can provide a viable pipeline for skilled talent and an alternative to conventional post-secondary degrees. U.S. studies show that workers experience large, statistically significant wage gains from participating in apprenticeship that exceed those of community college graduates over the long-term.[12,13] Apprenticeship is also a good investment for employers; a U.S.

What is Registered Apprenticeship?

For an apprenticeship program to be officially recognized by the U.S. government, it must be registered with either the U.S. Department of Labor's Office of Apprenticeship or a State Apprenticeship Agency and meet several requirements:

- **Business Involvement:** Employers must define the program policies they will use to sponsor full-time apprentices
- **Structured On-The-Job Training:** Apprentices must receive structured "on-the-job" training (at least 2,000 hours) and 1:1 mentorship from a designated company employee
- **Related Instruction:** Apprentices must receive related technical instruction (at least 150 hours per year)
- **Base Wage and Rewards for Skills Gain:** Apprentice wages must start at no less than 50% of the journeyperson rate and include benefits; wages must increase as competency grows
- **Nationally-Recognized Credential:** Apprentices must receive a portable, nationally-recognized credential of proficiency upon completion

[10] *"Diversity in High Tech"*, U.S. Equal Employment Opportunity Commission (EEOC), 2016. EEOC defines industries, according to NAICS classifications, as "high-tech" if at least 25% of occupations within the industry are technology-oriented. Other estimates for black and Hispanic share of the tech workforce are as low as 5% combined.

[11] Hoffman, Nancy, *"Schooling in the Workplace: How Six of the World's Best Vocational Education Systems Prepare Young People for Jobs and Life"*, Harvard Education Press, 2011.

[12] Reed et al., *"An Effectiveness Assessment and Cost-Benefit Analysis of Registered Apprenticeship in 10 States"*, Mathematica Policy Research, 2012.

[13] Hollenbeck, Kevin, *"State Use of Workforce System Net Impact Estimates and Rates of Return"*, W.E. Upjohn Institute for Employment Research, 2008.

Department of Commerce study of 13 employers with apprenticeship programs yielded unanimous agreement that the benefits of apprenticeship programs outweigh costs.[14] (Though tech apprenticeship ROI is still in development) Overall, 97% of U.S. employers with apprenticeship programs would recommend apprenticeship to other companies.[15]

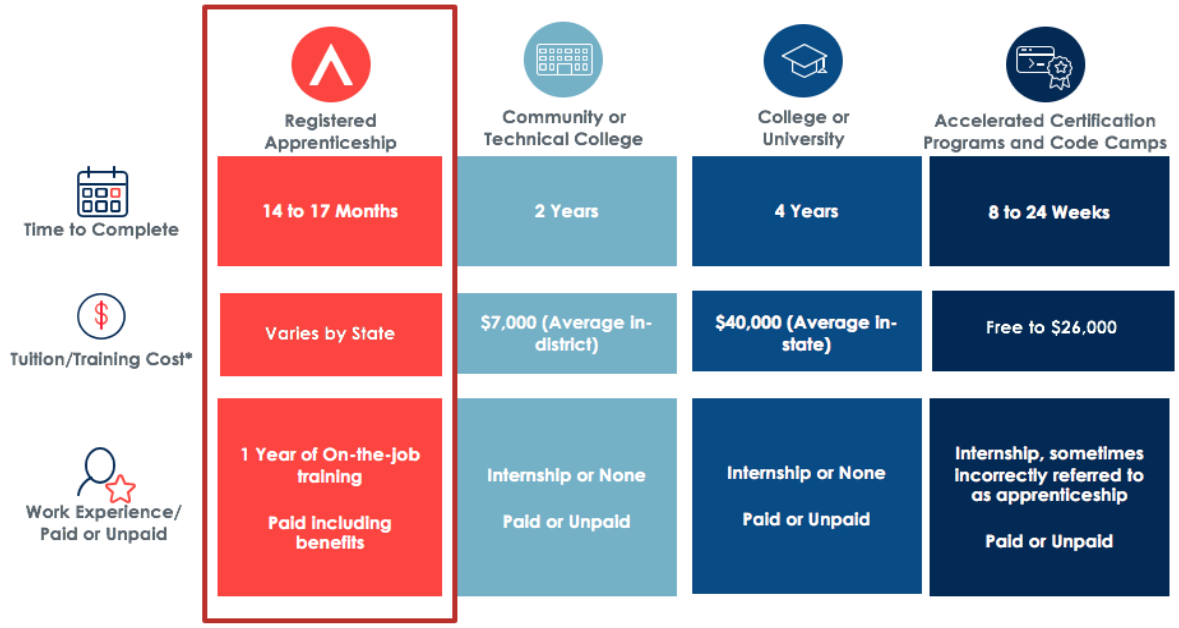
Despite compelling examples, however, apprenticeship is substantially less common in the U.S. than in many European countries and has traditionally been associated with so-called "blue-collar" occupations. Apprentices make up only 0.2% of the U.S. labor force compared to 2-4% in Germany, the U.K., and Canada.[16] The most recent federal data from 2017 show that U.S. apprentices were concentrated in a few industries: construction (68%), public administration (9%), manufacturing (7%), transportation (6%), and utilities (4%).[17] The story in Washington is the same; through December 2018, there were about 19,220 registered apprenticeships in the state, of which only 1,958 (10%) were women, and 14,174 (74%) were in the building trades. Tech or IT roles represented .06%, all from Apprenti.[18]

But the winds are shifting. Registered apprenticeship is increasingly garnering interest from a range of employers as well as federal and state policymakers due to its exceptionally tight alignment to workforce needs, its favorable economics, and its ability to supply diverse talent. Apprenticeship has won bipartisan federal support, and there is political and legislative momentum behind apprenticeship expansion at both the federal and state levels, especially for tech roles where talent and diversity challenges are particularly acute as is the disconnect with industry's rapidly evolving needs.

Internships are *generally limited to college enrolled students, paid in the tech sector due to intellectual property rights and are not preparing the intern to be "work ready". Essentially a short-term* ***try before you buy*** *with limited value to employers as each employer defines its internship process differently.*

Apprenticeships are Train to Retain*, companies place the apprentice in a headcount it intends to fill, then spend one year mentoring the person into the staff member they need. The classroom training, often resulting in an industry recognized credential, coupled with the apprenticeship completion credential, makes them industry viable and a known quantity, thus portable.*

[14] *"The Benefits and Costs of Apprenticeship: A Business Perspective"*, U.S. Department of Commerce and Case Western Reserve University, 2016. Only two of the 13 firms (Dartmouth-Hitchcock, Siemens USA) evaluated return on investment quantitatively, with both finding that benefits exceeded costs during the apprentice's first year of full-time employment post-program. The Dartmouth-Hitchcock and Siemens USA programs are one year and four years, respectively.
[15] Lerman et al., *"The Benefits and Challenges of Registered Apprenticeship: The Sponsors' Perspective"*, Urban Institute Center on Labor, Human Services, and Population, 2009.
[16] Lerman, Robert, *"Expanding Apprenticeship Opportunities in the United States"*, Brookings Institution, 2014.
[17] One8 calculations based on data from: *Registered Apprenticeship National Results, FY 2017*, U.S. Department of Labor, Employment and Training Administration. Calculations exclude U.S. Military Apprenticeship Program.
[18] Washington State Apprenticeship & Training Council, Fourth Quarter 2018 Report, January 17, 2019 *www.Lni.wa.gov/TradesLicensing/Apprenticeship/files/quarterly/January2019.pdf*



At the federal level, movement began in 2016 when the Obama Administration awarded American Apprenticeship Grants to public-private partnerships across the country. In 2017, President Trump signed an Executive Order aimed at expanding the number of apprenticeships and increasing funding for apprenticeship programs. Most recently, the U.S. Labor Secretary announced additional grant funding to support sector-based approaches to expanding apprenticeship, with a focus on sectors that have not traditionally relied on apprenticeships.[19]

Many state policies have followed suit, with input from Apprenti, in providing public subsidies to support private hiring needs. Governor Inslee, Washington, provided a $4.0M grant to subsidize up to 50% of training costs for tech apprentices in the state through Apprenti. Former Governor Kashich, Ohio, provided a start-up grant exclusively for training subsidies to Apprenti spanning the next two years. Go Virginia is subsidizing training dollars directly through the Norther Virginia Community College (NOVA) to reduce related technical training costs. Governor Baker, Massachusetts, has expressed his commitment to apprenticeship and there have been several legislative wins, including a line item appropriation for training in the most recent state budget and a new state tax credit for employers sponsoring apprentices in non-traditional sectors.

It is within the context of a strong evidence base and a favorable policy environment that Apprenti has emerged with a scalable model that is showing strong early signs of success.

[19] *"U.S. Departments of Labor Announces Funding For Apprenticeship Expansion in Key Industry Sectors"*, U.S. Department of Labor, 2018.

APPRENTI

Three years ago, the Washington Technology Industry Association (WTIA) conducted a study which shed light on the pernicious diversity and talent gaps in the Washington state tech sector. WTIA recognized good work was already underway in the area of K-12 education reform to strengthen student interest and achievement. Similarly, there was ample work being done on immigration reform to expand the pool of traditionally qualified candidates. WTIA decided to focus its efforts on a new training pathway and launched Apprenti as a Registered Apprenticeship program designed by a group of tech companies, including Microsoft, specifically for tech roles. The WTIA set up the WTIA Workforce Institute, a 501(c)(3) organization, to house this new area of programmatic activity.

A working group of WTIA member companies and Apprenti leadership started by identifying the most critical hiring need, "middle skill" jobs, and a set of middle skill job types in the tech arena – defined as jobs with potential for upward mobility that traditionally would have required a college degree – as the highest impact area for apprenticeship. Since then, Apprenti has outlined 13 "middle skill" tech occupations it can fill with apprentices; for each of these occupations, Apprenti has worked with an employer committee to complete a full documentation of the competencies for the role and registered the occupation with the relevant federal and state regulatory agencies. (See Appendix A for full list of registered roles.) Apprenti launched its first cohort of apprentices in November, 2016 with pilot partners including Microsoft and Amazon and has since won a U.S. Department of Labor contract to expand the program nationally. Today, Apprenti is operating in eleven markets across the country.

PROGRAM

There are five main pieces to Apprenti's program model.

1. Apprenti works with companies to secure headcount for apprentices – apprenticeship is a job – so employer hiring commitment is a requirement for initiation.
2. Apprenti recruits and evaluates diverse candidates for the program.
3. Apprenti coordinates training for candidates tailored to specific "middle skill" job roles but common across employers with employer input.
4. Apprenti does light-touch case management work and intervenes as needed while the apprentice is completing the technical instruction and on-the-job training.
5. Apprenti liaises with state and federal agencies to formally register its tech occupations, continually update occupational skills to keep up with the dynamic needs of industry, and secure public funding where possible.

The outcome is that apprentices graduate with industry recognized related certifications/training, a DOL credential for completing apprenticeship per industry standards– essentially proving competent to be a "journey worker" in the role– with a full year of experience leading to this level of competency.

In the area of candidate recruitment and evaluation, Apprenti has designed its process around the fundamental belief that job-seekers should be evaluated on the basis of ***competency not pedigree***. Employers informed the process of defining "competency" as a mix of mathematical ability (at an algebraic and geometry level), skill in critical thinking/problem solving, and emotional intelligence. Apprenti evaluates competency in all three areas using a custom-built, online aptitude test and a set of interviews with the Apprenti team. The most promising candidates are then presented to prospective employers for in-person interviews and final decisions based on a soft skills interview. Notably, employers do not have access to candidates' work histories or education levels at the time of the in-person interview. In fact, Apprenti does not even collect this information from candidates unless an employer decides to extend an offer of employment and the candidate accepts.

Training only begins when a candidate accepts an employer's offer. This sequence differentiates Apprenti from other tech training programs; no candidate can begin training unless there is a guaranteed, employer paid apprenticeship on the other end; contingent on satisfactory completion of classroom training. The first phase of training is classroom-based, employer-influenced, role-specific instruction, which lasts three to five months depending on the role. Technical training is provided by third-parties, which Apprenti vets and selects by market. When technical instruction is complete, apprentices begin 12 months of "on-the-job" training. During on-the-job training, apprentices are placed on teams at their companies, assigned official mentors to oversee their on-job learning and development, paid at least 60% of the full-time entry-level salary, and provided benefits. At the end of the apprenticeship period, employers have the opportunity to retain apprentices as traditional employees, though apprentices are not required to stay.

Apprenti has two goals against which it measures success in closing talent and diversity gaps:

- Talent Gap: Apprenti aims to have at least 80% of apprentices retained full-time within the sector (ideally at their host employers) at the end of the official apprenticeship period.
- Diversity Gap: Apprenti targets populations that are underrepresented in the tech sector, specifically women, people of color, and veterans. Apprenti strives for at least 70% of its apprentices to fall into at least one of these three demographic categories.

Companies working with Apprenti agree with two fundamental principles:

- First, that there is a vast untapped resource of people domestically, capable of doing these jobs, that would benefit from a combination of technical training/retraining combined with mentored hands-on experience. The minimum term of 1-year of hands on experience required in registered apprenticeship is a strong entry point for getting a person qualified for these roles.
- Second, that there are few differences in tech roles across sectors and geographies. Thus, we need to build one cohesive system/set of standards that companies can easily operationalize across all U.S. states; not one per company, nor one per state. This universal approach allows for consistency in program fidelity, standards, quality and provides clear portability.

EARLY SUCCESS

As of March 22, 2019, Apprenti has placed 429 apprentices with 30 tech companies over 28 months. (Forecasting to exceed 1,000 apprentices in 2019) Apprenti is serving large tech companies like Microsoft and Amazon, as well as small and mid-sized tech companies like Silicon Mechanics and Avvo.com. An additional 20 companies have signed Letters of Intent/MOU's to bring on apprentices in 2019, including employers from non-tech industries such as healthcare (Partners Healthcare, BlueCrossBlueShield), financial services (JPMorgan Chase, Huntington Bank), who are all competing for tech talent.

Companies believe in the registered apprenticeship model due to its rigor, consistency and ability to scale, serving an entire industry sector. Early results are promising. Placement data shows 84% are retained within the sector, creating a new ecosystem of talent, plus diversity with a high share of women (25%), people of color (41%), and veterans (59%).[20] In total, 81% of apprentices fall into one of these target demographics. Apprentices come from a variety of educational backgrounds; 48% have at least a four-year college degree, 44% do not have any post-secondary degree and another 8% have a two-year degree. Competency is proving more important than degrees or degree types as retention is the same for both college and non-college degreed apprentices.

> *"Before participating in the Apprenti program, I was working odd jobs and scraping by. The program has been life-changing for me financially."*
>
> *- Yana Radenska*

[20] Amazon, Apprenti's largest hiring partner, has an initiative to hire veterans, thereby skewing overall apprentice demographics toward veterans and men. Excluding Amazon, women improve to 34% of placements.

Income data suggest the program is delivering value for apprentices. The apprentices served to date have moved from median annual pre-apprenticeship earnings of $29,000 to median apprenticeship earnings of $51,000 to median post-apprenticeship earnings of $75,000. In total, this has reflected a 155% jump in median earnings from the pre-apprentice level to the post-apprenticeship role less than eighteen months later. Early retention figures have also been strong; to date, 84% of those completing apprenticeships have been retained.[21]

Employers also appear to be satisfied with the program. In its second year, Apprenti saw strong hiring partner retention and growing commitments from Microsoft and Amazon with significant growth in new adopters. Specifically, Amazon doubled its 2018 hiring commitment and ended its in-house apprenticeship program in favor of Apprenti. Microsoft is evaluating the scale of adoption it's able to support with Apprenti. (See Appendix E for demographic information on Microsoft cohorts to date.)

"At [our company], our apprentices come into the same roles as many recent college grads. They don't always have the same educational pedigree, but they hustle and they bring a lot of non-technical skills that are valuable. Plus, a lot of our apprentices are just trying hard to get their foot in the door somewhere, so when we take a chance on them, we think that's compelling for long-term retention."

- Kevin Goldsmith, CIO, Avvo.com

MODEL

Apprenti began to help companies build apprenticeship systems in-house. Over time, Apprenti evolved to become the industry intermediary, to address a number of business needs, from assessing and screening prospective talent to managing the filing, registration and compliance of apprenticeship. This led to Apprenti winning the U.S. Department of Labor contract as the IT Sector Lead. Companies operating across multiple markets desired a standardized national system; they agreed on the roles that were most apprenticeable, and that those roles ostensibly function the same across companies and sectors.

In each market, a three-person team has responsibility for a range of functions including, but not limited to: business development to recruit new employer partners, updating occupational roles and registering them with the state, attracting and screening local apprentice candidates, selecting training providers, and providing light case management to individuals in the program. Local market partnerships are developed with organizations serving employers such as technology councils and chambers of commerce. For talent development, outreach targets community colleges, community orgs serving diverse populations, military bases and workforce boards.

In each market, a local, non-governing Apprenti Executive Committee – consisting of stakeholders from both industry and government agencies – provide oversight as well as strategic and operational guidance to the local team.

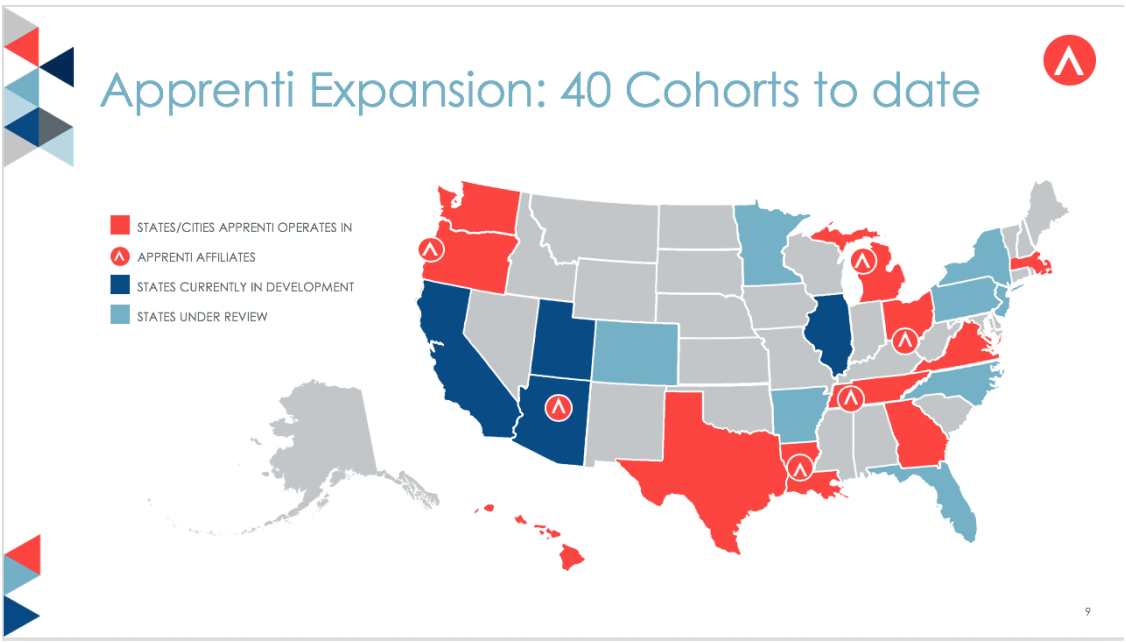
[21] 84% retention represents Apprenti's first five cohorts. Apprenti's long-term, steady state expectation is 80% retention within sector.

Apprenti's operating plan builds sustainable operating scale within its first three years of operation to the point where the overhead is covered by nominal employer fees and is industry directed in that we go where companies state they have hiring needs. In current markets; sourcing grants to fund the initial development term is time consuming, but has proven the model in four of eleven markets; however, investing federal grants in successful models like Apprenti can scale new markets for the IT sector more quickly. The average market needs $1.0MM over three years to scale a financially sustainable business.

Additionally, as each new market opens, new hiring companies look for public/private partnerships to fund the preparatory classroom training to get apprentices technically competent before beginning their year of OJT. The average cost of this immersive, 40-hour per week, 3-5 months of technical training costs an average of $15,000 per person. Hiring companies are willing to subsidize up to half of this cost, in addition to apprentice salary and benefits during OJT. Training must be nimble, accelerated to meet industry timetables and able to shift quickly as technical platforms and software language change (typically changing or modifying every 24 months). Training providers include private code academies, certified corporate trainers and select community colleges via continuing education departments.

Three recommendations:

- Building a sustainable funding source for training dollars that states and companies can access would significantly accelerate adoption. (E.g. 1/3 Federal, 1/3 State matched, 1/3 Employer)
- Creating million-dollar micro-grants, over three-year terms, directed at chambers and trade associations with deep company relationships to expand this registered apprenticeship model
- Shift implementation focus away from “filing of standards” to outcomes: Numbers placed, retained, income improvement, diversity ratios and adherence to regulations around registered apprenticeship



FINANCIALS/ROI

The above chart illustrates the lifetime forecast of apprentices in software development based on current data. With a median age in apprenticeship of 32, the forecast looks out 20 years with a known retention income after graduation from apprenticeship of $88,000. For an apprentice, this equates to:

- Lifetime improved earnings exceed $1.6M per person
- Using Apprenti's current 133 Software Developer Apprentices x $1.6M improved earnings = **$212,800,000** in overall improved lifetime earnings from program

If funding were offered to support scaling to 20 additional cities, generating new 5,000 apprentice software developers:

- 5,000 Apprentices x $1.6M improved earnings = $8,000,000,000 in total improved lifetime earnings
    - Start-up costs of $20,000,000 for three-year operating grants in new 20 markets
    - $75,000,000 in accelerated classroom training expense
        - Recommend braided funding: $25M from Federal Government, $25M matched by State, $25M from Employers
    - Tax revenue to U.S. Government: >$1B
    - Cost to deliver Registered Apprenticeship: 1.25% of gross earnings or ~$95M

RECOMMENDED POLICY CONSIDERATIONS TO SUPPORT EXPANSION OF REGISTERED APPRENTICESHIP:

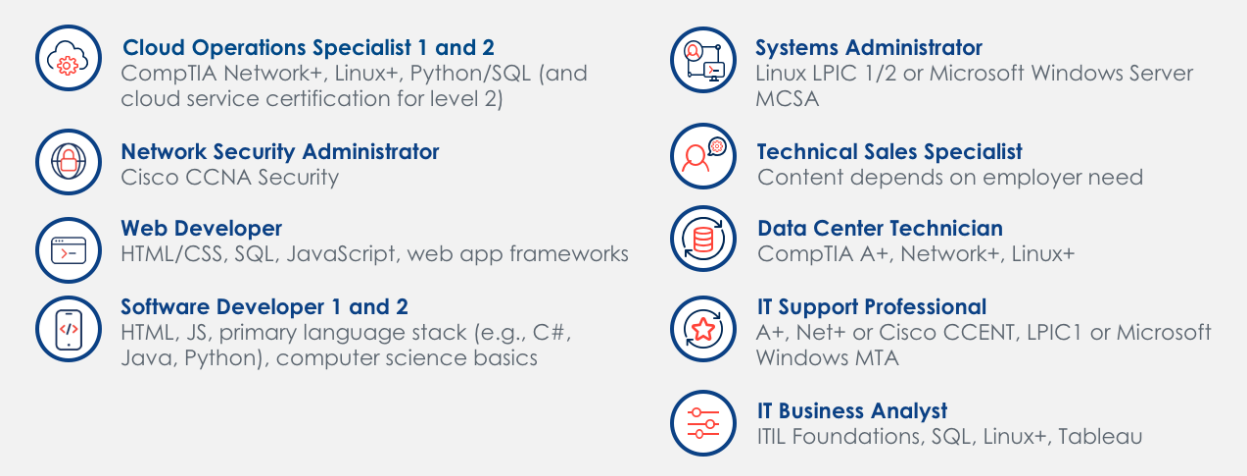
As Apprenti has engaged with over 500 companies ranging in size from 50 employees to over 100,000, and 25 states seeking to understand tech as an apprenticeable model, it has learned a great deal about obstacles and policies needed to stimulate increased adoption:

- Apprenticeship is a new concept for tech companies in the United States. They are changing culture to become training-centric, absorbing the employment cost of hiring and training apprentices on-the-job, but want the public sector to share in that risk. Subsidizing training costs (RSI) more substantially and sustainably, reduces risk around the non-conformity to corporate hiring processes and encourage participation.
    - Create a sustainable, annual, >$250M Federal fund that states can match to support the classroom training costs of developing apprentices in non-traditional sectors.

- Recognizing that new sectors will take time to build, invest in expansion for programs that have track records and momentum.
    - Currently, DOL is focused on tracking numbers of new program/occupations filed, a metric that does not create sustainable adoption. If the sector is asking for a unified solution that establishes standardized job frameworks that are portable, the focus should be on measurable outcomes, I.e., improved earnings, retention, diversity ratios, etc.

- The Trades have enjoyed the benefits of the Fitzgerald Act for over 80 years, and the term “Apprenticeship” has had a clearly defined, indisputable meaning. However, as new sectors engage and attempt to understand the rules of engagement with registered apprenticeship, the greatest challenge has been the misuse and marketing of the word “apprenticeship”. The lack of continuity around its use and inconsistency in applying it at the regulatory level has created significant brand confusion in the market.
    - Codifying into law the current regulations defining a “Registered Apprenticeship” would reduce brand confusion, create clear guidelines around its use and meaning, and establish accountability for its use in the case of aforementioned training subsides.

Appendix A: Apprenti Roles Filed w/ Sample Certifications and Locations



Note: Additional occupations being filed include Data Analyst, Security/Cyber Analyst, QA and UI/UX. Apprenti can also file new occupations and build specialized programs. Project Management is filed and approved, though no demand.

Number of Apprentices by State/City:

Washington – 171	(Most mature market 28 months of operation, began with 6 apprentices in first cohort, grew to 40 second year and will place over 200 this year. Forecast continues to show double that in 2020.)
Oregon – 41	(Second most mature, smaller markets and companies)
Virginia – 138	(Large companies, third market of operation)
Tennessee – 12	(Affiliate began in Q4 of 2018)
Dallas, TX – 28	(One employer, one-year-old market)
Columbus, OH – 13	(Began Q1 of 2019)
Baton Rouge, LA – 9	(Began Q4 of 2018)
Massachusetts – 15	(Began Q1 of 2019)
Michigan – 2	(Began Q3 of 2018)

Appendix B: WTIA Workforce Institute Board Members

Greg Beams – Partner, Ernst & Young (retired), Board Chair

Bradd Busick – Chief Information Officer, MacDonald-Miller

Cefe Quesada – Managing Director, Global Technology Services, State Street

Jennifer Carlson – Co-Founder & Executive Director, WTIA Workforce Institute

Portia Wu – Director, Workforce Policy, Microsoft

Michael Schutzler – Chief Executive Officer, WTIA

Kraig Baker – Partner, Davis Wright Tremaine, 2019, Secretary

Apprenti Apprenticeship Committee

Employer Representatives:

Jason Johnson (Chair) – Director of HR, Microsoft

Robin Baker – Lead Military Recruiter, Amazon

Kelly Harkins – Sr. Program Manager, Accenture

Birgit Zeidler – Senior HR Professional, F5 Networks

Nick Curry – Alternate, Amazon

Employee Representatives:

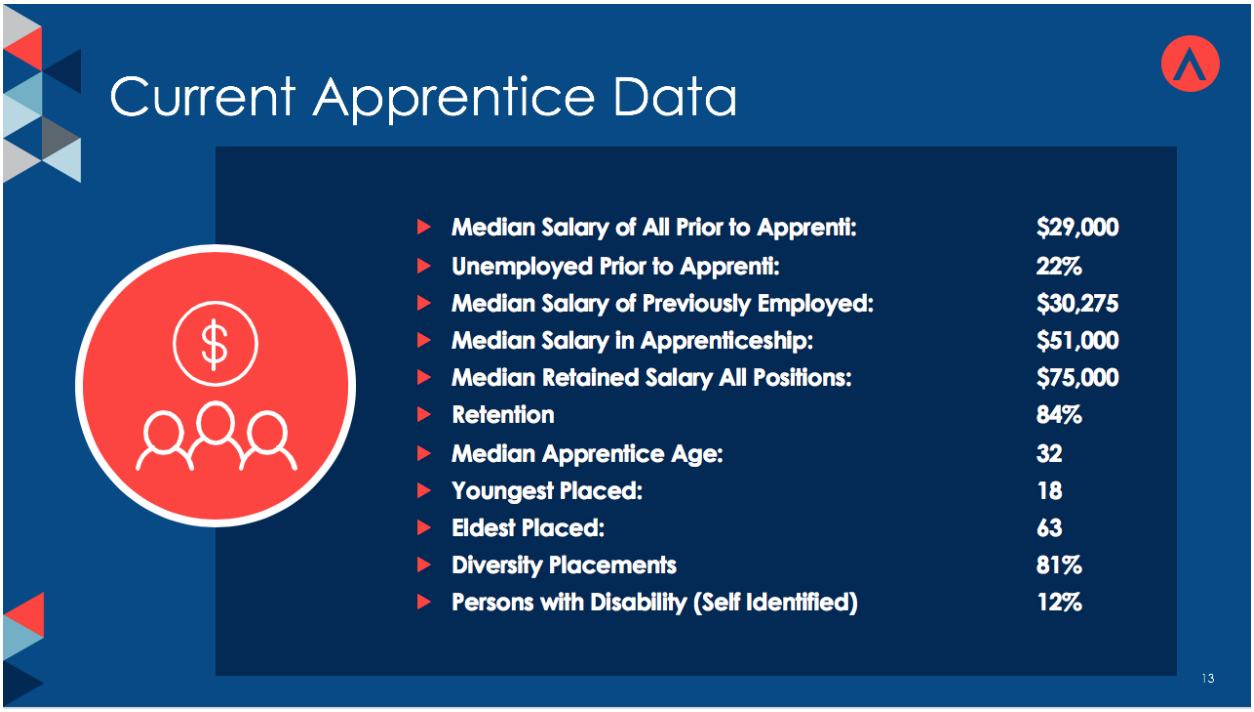
Lief Zimmerman (Secretary) – Software Developer, Comtech Communications

Amy Morgans – Project Manager, Synapse

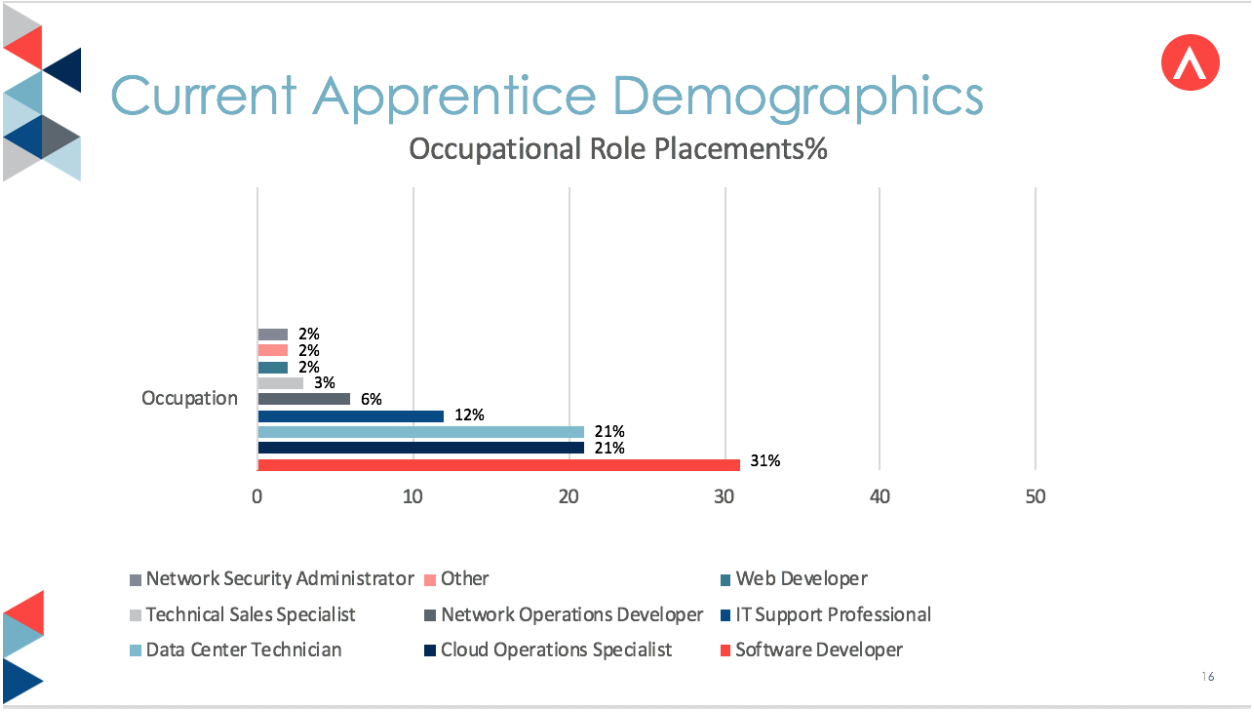
Adam Anderson – Systems Administrator, Silicon Mechanics

Hunter Davis – Lead Software Developer, Avvo.com

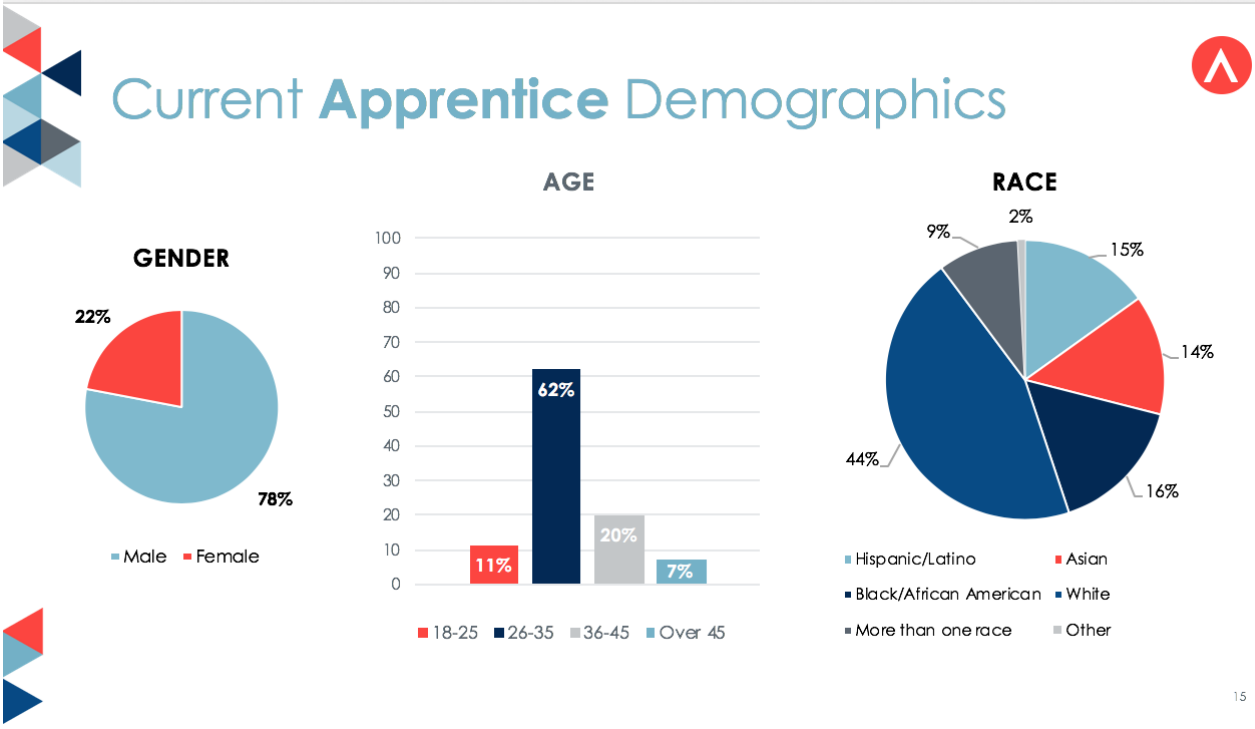
Appendix C: Program Performance & Demographic Data (through 3.15.19)



Occupational Breakout:

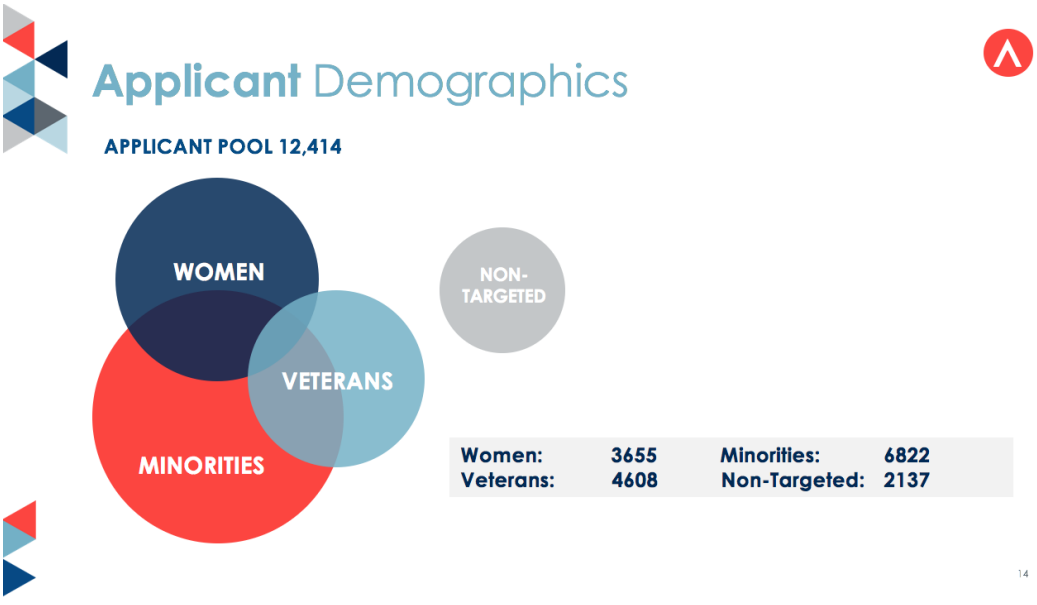


Gender, Veteran Status & Ethnicity



Gender is skewed by one employer focused on Veteran hiring. If we exclude one employer, the number of women improves to 29%. While 44% of placements are Caucasian, nearly half are Veterans and women.

Total Applicant Pool



A few Registered Tech Apprentices

ALEM

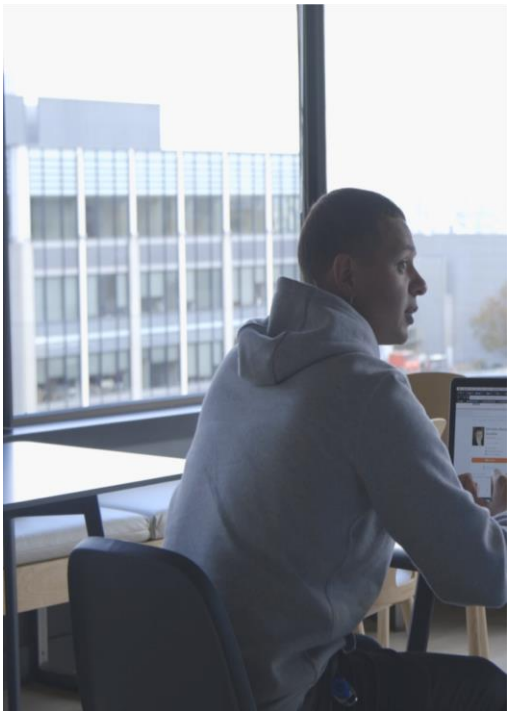
- **PRIOR EDUCATION:** B.A. International Security & Conflict Resolution
- **PRIOR JOB:** Uber driver
- **TRAINING DELIVERED:** 5 months Python, HTML, and C#
- **APPRENTICESHIP:** Microsoft Software Developer

APPRENTI
The path, the plan, your career in tech.

MAKI

- **PRIOR EDUCATION:** Some college
- **PRIOR JOB:** Crowdsourcing specialist
- **TRAINING DELIVERED:** 5 months Python, HTML, and C#
- **APPRENTICESHIP:** Microsoft Software Developer

APPRENTI
The path, the plan, your career in tech.



SHAWN

PRIOR EDUCATION: B.A. in Business & Art; Associates in Computer Science

- **PRIOR JOB:** Lead at moving company
- **TRAINING DELIVERED:** 5 months HTML, CSS, JavaScript, Node/Angular.js
- **APPRENTICESHIP:** Avvo Web Developer
- **CONVERTED**: to staff after 8 months

APPRENTi
The path, the plan, your career in tech.

VIVIAN

- **PRIOR EDUCATION:** Some college
- **PRIOR JOB:** Network Admin, veteran
- **TRAINING DELIVERED:** 4 months of Network+, Linux+, Python, and Juniper
- **APPRENTICESHIP:** Amazon Network Development Engineer

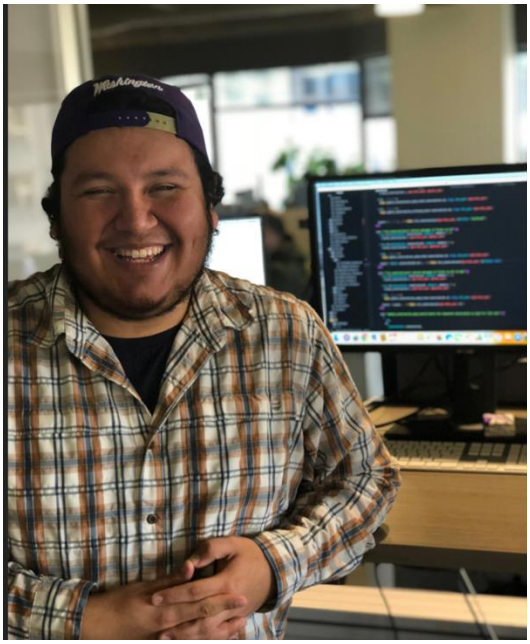
APPRENTi
The path, the plan, your career in tech.

Living the tech dream, thanks to a novel apprenticeship program

Beth Pinsker

5 MIN READ

NEW YORK (Reuters) - While growing up in Seattle, Enrique Rico's mom cleaned the posh homes of Microsoft employees. When Rico tagged along on sick days from school, he dreamed of having the life of a technology worker.



Enrique Rico, 26, a developer at Avvo, an online marketplace for legal services, is seen in Seattle, Washington, March 2018. Courtesy Enrique Rico/via REUTERS

Now, at 26, with no college degree or background in STEM, Rico is working a developer at Avvo, an online marketplace for legal services.

He is a graduate of a program called Apprenti that provides education and on-the-job training for tech jobs to non-traditional recruits.

“I never really thought I could do it. But once I dug deep, I gave it my all,” said Rico.

The Apprenti program is run by the Washington Technology Industry Association in partnership with the U.S. Department of Labor. It operates at around 50 companies nationwide with major employers including Microsoft (MSFT.O), Amazon.com (AMZN.O) and JPMorgan Chase (JPM.N).
During the first year of the program in 2017, 76 candidates went through the training, which includes about 400 to 780 classroom hours on the front end, compressed into 12 weeks.

After a year of on-the-job training, the program will finish 2018 with 330 graduates placed into full-time jobs. The class of 2019 is on track to produce more than 700 graduates.

Amazon expects its apprenticeship cohort to grow from 150 to 1,000 workers in the next few years, said Tammy Thieman, a senior program manager at the ecommerce giant.

The tech industry had 2.8 million openings last year, with 50 percent of them middle-level jobs that do not necessarily require a college degree, according to Jennifer Carlson, executive director of Apprenti.

The pace of hiring is lagging, however, because companies cannot find properly trained workers, she said.

“This industry needed technical competency at the start - that’s a paradigm shift from traditional apprenticeships,” Carlson added.

Apprenti focuses on veterans, women and under-represented minorities, screening about 2,000 candidates to find 700 candidates for 2019.

Amazon teamed up with Apprenti after its CEO Jeff Bezos made a commitment in 2016 to hire 25,000 veterans and military spouses by 2021. But the apprenticeship program quickly broadened to find qualified workers for a vast swath of open jobs that required specific credentials.

"It is not at all unrealistic that freshman going to college today come out already behind," said Amazon's Thieman. "An apprenticeship offers a model to do the learning in a compressed way and then learn the skills on the job.

While veterans often have valuable skills, they usually do not have a conventional resume or workplace experience. That is why the biggest challenge currently for veterans is being underemployed when they leave the armed forces, said Chris Newsome, vice president of candidate aggregation at Recruit Military.

"A lot of these men and women are able to find jobs, but not necessarily careers," Newsome said.

New college graduates often will need to complete a program like Apprenti to be job-ready because programming languages and platforms change so quickly.

Training at universities or even specialty classes at community colleges also do not quite stack up when it comes to hiring for a role such as cloud administrators which require specific certificates, Apprenti's Carlson said.

Even boot camps for coding do not necessarily do the trick. Rico tried that route first, quitting his $16.50-an-hour job as a salesperson at an Apple Store to go into a coding program.

But without a college degree, he did not stand much of a chance against the automated interfaces most big tech companies use to sort through applicants when hiring.

DIVERSITY BOOST

For smaller companies like Avvo, Apprenti is more of a mission.

"The executives saw the value of a program that gets you talented engineers and does a social good," said Hunter Davis, director of engineering at Avvo.

The company has about 25-30 developers currently on staff, with about 15 percent of them coming through Apprenti.

"They are awesome and full of grit and willing to learn," Davis said.

The leg up for Apprenti grads starts right away. Like Rico, many were previously working minimum wage jobs, with a median income of $28,000 and most without benefits. The starting salary in the Apprenti program is $45,000 during training.

At six months when candidates begin their on-the-job training, the salary rises $51,000. If they get hired full-time - and almost all of them do - Apprenti grads make at least $75,000.

That is a life-changing salary for most of the participants.

"I have an apartment and a dog and a cat," said Rico, who is still dreaming. "I'd love to get married and have kids and buy a house. I want to be my own boss. I would love to start my own company."

Editing by Lauren Young and G Crosse
Our Standards:The Thomson Reuters Trust Principles.

https://www.reuters.com/article/us-world-work-apprenti/living-the-tech-dream-thanks-to-a-novel-apprenticeship-program-idUSKCN1P91CY