Good Jobs Challenge - Project Narrative

Project Title: **Managed Apprenticeship as a Service: From Talent Consumption to Creation**

1.A. Project Description and Overview Section

Annually in America, over 3 million engineering jobs are posted yet only 255,000 engineers (electrical, mechanical, civil and computer science) graduate from four-year degree institutions. It is evident talent production is not meeting market demand. With 80,000 engineering graduates in Computer Science, and H1B visas contributing another 60,000 international workers, Apprenticeship is an appropriate third leg on the U.S. tech ecosystem employment training stool.

The WTIA Workforce Institute, (dba Apprenti) is collaborating with two pillars of the U.S. technology marketplace -- Boeing and Amazon Web Services (AWS) -- to address the talent and diversity gap in the tech sector, specifically in cybersecurity, software development and cloud computing. Boeing, AWS and Apprenti are building systems similarly fashioned to the industry standard Software as a Service or SaaS, in this case, Managed Apprenticeship as a Service (MaaS). This innovative model will enable Boeing and AWS to quickly train and deploy new and reskilled talent - to include diverse and non-traditional individuals - into mid-level, family wage tech jobs within their customer and vendor ecosystems. As an IT industry intermediary, Apprenti will support Boeing and AWS by managing delivery of apprenticeship, including but not limited to, recruiting historically underrepresented groups, monitoring compliance requirements, sourcing industry leading training providers, and offering best practices on adopting, operationalizing, and scaling registered apprenticeship.

The work is rooted in **President Biden's Executive Order** on diversity, equity, inclusion and accessibility (DEIA) with the goal of building back our economy to be more inclusive of historically overlooked talent.

1.B. Backbone Organization

WTIA Workforce Institute, dba Apprenti (Backbone Organization)

The Washington Technology Industry Association (WTIA) is the unifying trade association representing Washington State's technology companies, with over 1,000 active members. WTIA's services include developing pipelines to recruit and retain diverse tech talent, advocating for public policies and creating forums for effective industry, education and government partnerships. In 2015, WTIA established the Workforce Institute, publicly known as Apprenti, to address the significant information technology talent gap in Washington state and beyond by sponsoring a Registered Apprenticeship program for IT. With initial funding through the U.S. Department of Labor's early apprenticeship expansion initiatives under President Obama, Apprenti started in Washington state but quickly responded to continuity needs of the industry to reduce stress on business operations by standardizing the system nationally. Apprenti is a lead U.S. DOL contractor to expand that apprenticeship model nationwide under the Apprenticeship USA Single Industry Intermediary Contract. Since its creation Apprenti has grown to 23 full-time employees dedicated to addressing the tech industry's workforce and

diversity issues and to support economic growth and mobility.

Apprenti has convened employers, funders, state and federal agencies, community-based and nonprofit organizations, workforce boards and a wide range of public and private training entities to build the ecosystem needed to implement apprenticeship for the tech sector. Apprenti actively engages with diverse populations including individuals with disabilities, women, veterans, and people of color, with additional focus on covid displaced persons. Apprenti has over 29,000 applicants from diverse backgrounds.

Apprenti is a skilled fundraiser. It began in 2016 by funding 100% of related supplemental instruction (RSI) tuition costs through donations, earned revenue used as subsidy, and a grant provided by the State of Washington to help demonstrate the value of apprenticeship in non-traditional sectors. Six years later, 100% of employers pay 50% of RSI costs. The remaining 50% is braided with a combination of workforce boards leveraging WIOA funding where apprentices are eligible, state grants, and private philanthropy to keep the financial burden of RSI off the shoulders of apprentices. The program has secured RSI grants in ten states to cover this delta in addition to securing over $12.5M in operating capital through grants and private philanthropy over six years. Combined value of funding raised is nearly $30 million since 2016.

Please see attached 5 Year Performance Summary for detailed data on Apprenti's success.

Section 2. Employers and Stakeholders

2.A. Employer Leadership and Commitments

AWS and Boeing are partnering with Apprenti to bring about a cultural shift in workforce development – from talent consumption to talent creation.

Boeing, the U.S. industry leader in aviation, currently has 14,000 job openings; over 120 in Cybersecurity and 700 in Software Development. To address the immediate demand, Boeing will launch a pilot apprenticeship program in Cybersecurity and Software Development in April 2022. Boeing apprentices will earn 60% of the target end salary (between $63,000 and $68,000) at the start of the program, and receive a wage "step" increase after completing 1,000 hours of On-the-Job Training (OJT). For more information on salary and benefits please see section 4.C.

To address its longer-term and ongoing talent demand, Boeing is creating an apprenticeship program to fill Cybersecurity and Software Development roles with "work ready" talent internally and in their broader ecosystem. Boeing will create a recurring pipeline of talent for its commercial and government vendor ecosystems by filing standards unique to cybersecurity needs with the intent to expand externally to its partners. Boeing's long-term strategy is to create an industry recognized credential for the aerospace sector. Offering this apprenticeship system externally to its vendors would qualify vendor apprentices to work on Boeing contracts. Apprenti will support these efforts by working with preferred training partners like Rapid Ascent, the college systems, community-based organizations, and other employers in the aerospace and aviation ecosystem to expand access and adoption of registered apprenticeship through MaaS.

Similarly, AWS, a four-year consumer of registered apprenticeship for its own hiring needs, intends to address the talent gap in cloud computing - its core business and one of the fastest growing areas in information technology. Spending on public cloud services and infrastructure will more than double to $500 billion by 2023, according to data from IDC. In the public cloud job market, there are six to twelve times more job postings available than there are job seekers, and 60% of the postings are on the AWS platform. To address the imbalance, AWS will deploy MaaS to rapidly develop and place talent across its cloud computing, consumer ecosystem.

Amazon has publicly demonstrated its commitment to workforce development by committing to invest hundreds of millions of dollars to offer free cloud computing skills training. With a goal of providing introductory training to 29 million people by 2025, Amazon continues to increase access to free cloud computing skills training[1].

Over the three-year grant cycle, AWS will hire 300 apprentices directly, and work within its ecosystem to place a minimum of 700 more apprentices with companies like Robert Half and InfoSys (see letter from Robert Half committing to hire 300; at the time of submission, InfoSys committed to placing 300, but the letter is still in process). Like Boeing, AWS will provide a training wage that's 60% of the target end salary, with a wage step increase at 1,000 hours.

The concept of apprenticeship is a train to retain model; 81% of apprentices in Apprenti's program are retained by employers at the end of apprenticeship. As this is a national initiative, reaching all regions, participation in tech apprenticeship during the first five years yielded the following results: 26% of placements were unemployed before entry, the median salary for remaining apprentices was $42,000 on entry. The median apprenticeship salary is $56,000 + benefits and the median retained salary is $86,000 + benefits.

If these statistics hold true, for the minimum 2,000 apprentices to be placed through this grant, the Department of Commerce can expect the following results via employer hiring:
- 520 unemployed will be employed at $56,000 = $29,120,000 in income during their year of apprenticeship;
- 1,480 under-employed will earn a median of $56,000, or an improvement of $14,000 during apprenticeship, for a gross improvement of $20,720,000;
- In first year post apprenticeship, the 81% retained by employers will earn a median wage of $86,000, which is improved economic mobility of $88,970,000 in the first year.
- This provides net **improved lifetime earnings of over $1.5 million per person** or **>$3.0 billion** for the apprentices served by this grant alone. This grant serves to develop the MaaS system with intent to scale, evolve and live for the foreseeable future.

2.A. Employer Engagement and Expansion

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[1] AWS Expands Access to Free Cloud Skills Training on its Mission to Educate 29 million People by 2025 | Amazon.com, Inc. - Press Room (aboutamazon.com)

Since Apprenti is an industry-driven model, it works alongside employers to co-design tech apprenticeships to meet each company's unique needs while standardizing work processes most consistent for tech roles. Apprenti's strategy centers around using already recognized training and industry-recognized certifications to support strong work processes; this drives portability to the apprenticeship credential making new talent more consumable for employers. The Managed apprenticeship as a Service model leverages AWS and Boeing's positions as industry leaders to cultivate the standards that address industry needs as well as the talent needed to fulfill them. By setting up a standardized system, it becomes easier for companies to adopt and implement regardless of jurisdiction, and operationalize apprenticeships.

Program Design & Implementation

AWS and Boeing are already actively engaged and invested in designing credentialed curriculum and training to upskill current staff and train future employees. Amazon will expand on its existing apprenticeship programs by making the re/Start global skilling program a Cloud computing pre-apprenticeship program. Boeing is in the early stages of creating a cybersecurity micro-credentialing program for reskilling internal staff. Boeing will also hire Cyber Analyst apprentices from underrepresented groups into the commercial and government business units. The Software Development apprenticeship program is slated to start in mid-2022. The pilot program will include ~100-150 apprentices in Cyber and Software Development, Boeing plans to expand occupations offered and scale their hiring commitment to reach 1,000 nationally.

Apprenti is responsible for recruiting and screening talent while employers make the final selection decision. Candidates must pass Apprenti's non-technical aptitude assessment to move on to two interviews. The company receives a curated group of candidates (two candidates for every one open position) for a final interview (personal information redacted to focus on skills and to reduce bias). Employers extend offers to those they select after a soft skill interview.

The grant funding will expand access to employer-designed credentialed/training structures and establish a new proof of concept for MaaS delivery, i.e., systems designed to deliver talent externally and change management to implement a tailored order-to-delivery system for talent. Boeing and AWS will be actively engaged in developing related apprenticeship standards and directing training requirements to ensure they meet their respective business needs.

Program Expansion

The MaaS model will rely on employers understanding the benefits of registered apprenticeship and shifting culture toward investing in training competent talent on the job. To achieve this, Apprenti will partner with AWS and Boeing on building communication strategies to reach customer/vendor bases, inform about the value proposition, engagement process and enablement of this offering. Additional outreach will take place through Tech councils of North America (TECNA) and its member organizations nationally that collectively represent 22,000 tech and tech adjacent companies in the U.S. The apprenticeship model is relatively new to the information technology sector so there is a need to focus significant time and resources on educating companies in addition to subsidizing training (RSI) costs for apprentices.

Apprenti will use grant funds to expand staff to meet scaled market demand. New business development staff, program specialists and community engagement support will work with AWS key cloud account management to support delivery of Cloud apprentices for its ecosystem - those using the AWS platform. AWS has over 10,000 companies on its cloud platform, including most of the Fortune 500, and there is a deficit of **thousands** of Cloud admins to fill market demand.

2.B. Other Stakeholders and Partnerships

Curriculum Development & Instruction

AWS is certifying and Apprenti is compiling a list of training partners to train a new crop of talent. Examples of AWS certified training partners include Northern Virginia Community College (NOVA), the largest public institution of higher learning in the Commonwealth of Virginia and one of America's largest community colleges. NOVA currently trains AWS cloud administrators through Apprenti and offers short-term, non-credit training via the Commonwealth's FastForward program - a short-term workforce credential program to train Virginians for in-demand jobs in IT.

Similarly, Boeing has identified RapidAscent as a training partner to pilot an aerospace-centric cyber training certification. Additional training entities will need to be authorized to meet demand from the Aerospace and Aviation industries by the end of the grant term. Boeing will leverage key learnings from AWS's certified training model, communication strategies for engaging its sector and training delivery. In both offerings, Apprenti surveys employers and apprentices through the year of OJT to evaluate how the training aligns to the work, understand gaps, and refine training between cohorts to continuously improve delivery and curriculum.

Workforce Partners

Apprenti will leverage partnerships with local workforce boards to support systems for apprentices where needed. To date, the focus of apprentice case management has typically been transportation, childcare and family services, and WIOA to subsidize training costs where eligible. Based on funding commitments made by the initial workforce board partners, and fulfillment of this grant, Apprenti will convene further workforce boards to build out standardized delivery criteria for implementation of WIOA assistance. Through the project development phase, Apprenti, AWS, and Boeing will leverage their respective networks to identify core stakeholders in each target region, which includes: college systems, workforce boards, private trainers, government, foundations and employers. (Please see letters of support in attachments.)

Wheelhouse Group, a change management consultancy with a focus on equity and accessibility to uplift underrepresented segments of the U.S., will work with Apprenti, AWS and Boeing to define work processes needed to implement and scale the MaaS delivery system. Portions of the grant will cover the consultant, data collection and reporting on systems and performance to ensure outcomes meet or exceed the Key Performance Indicators (KPI's) defined by this grant.

Labor Perspectives

Boeing and AWS will benefit from leveraging the experience and expertise of the Apprenti national apprenticeship committee. Today, Apprenti's group non-joint committee oversees the governance and operation of its program with a committee comprised of management and employee representatives from Accenture, Microsoft, Adobe, Comtech, F5, and Amazon. Boeing will consult with Apprenti from a labor perspective to ensure that Boeing's program operations and recruitment efforts reflect the diverse nature of recruitment and equity sought by all involved.

Apprenti's outreach methodology has been agreed to by all parties, which includes outreach to and inclusion of Community Based Organizations like 110.org, 100 Black Men chapter, National Urban League, local community colleges, HBCU's, Women's Funding Alliance, United Way, Goodwill Industries, minority focused code academies and youth programs like YearUp and Per Scholars, to name a few. The Society of Professional Engineering Employees in Aerospace (SPEEA), another critical partner, channels individuals who have been laid off and are seeking new career opportunities in IT and Cyber roles to Apprenti.

Apprenti's outreach to diverse populations has contributed to its sizable candidate pool which includes more than 29,000 applicants nationally – over 80% of whom are women, veterans, under-represented minorities, and individuals with disabilities.

3. Regional Description

Boeing and AWS are global powerhouses with significant national and international economic and marketplace reach. Studies[2] on the outlook of the tech industry workforce repeatedly note that a lack of qualified applicants results in an overreliance on foreign talent, including those on H1-B visas. Additionally, workforce shortages have significant impacts on companies' ability to meet customer demand, and safety and security needs of tech products and environments.

This decades-long workforce issue has been exacerbated by COVID-19, the rapid adoption of cloud-based technologies, and a finite college delivery system driving up already competitive wages. A recent CNBC Technology Executive Council survey[3] noted more than half of surveyed executives identified talent labor shortages as a larger risk than supply chain shortages and cybersecurity threats. Additionally, a study by the National Academies of Sciences, Engineering, and Medicine[4] posits the Federal Aviation Administration's inability to recruit talented and diverse cybersecurity professionals is indicative of the overall cybersecurity talent pool shortage.

This funding opportunity will not only assist Boeing and AWS but the larger aviation and cloud ecosystems to better meet demand by creating a secondary talent development system to parallel the college system. At a macro level, there are significant needs distributed across all regions,

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[2] The Tech Talent War Has No End In Sight. Here's What You Need To Know (forbes.com)
Hiring developers is going to be your next big problem - TechRepublic
[3] Labor outranks cyber threats as biggest concern for tech companies (cnbc.com)
[4] Summary | Looking Ahead at the Cybersecurity Workforce at the Federal Aviation Administration | The National Academies Press (nap.edu)

however, leading up to the development of the grant application each employer has identified 3-4 locations to begin the programs. The Boeing program will hire in Seattle, St. Louis, Missouri, and Huntsville, Alabama; AWS will hire in Herndon, VA, Houston, TX, Southern Nevada, and Seattle. Additional markets have been identified for the second phase of expansion including Pennsylvania, New Jersey, North Carolina, Louisiana and Ohio.

Comprehensive Economic Development Strategies[5]

Seattle: The Puget Sound Regional Council encompasses King, Kitsap, Pierce, and Snohomish counties and is home to nearly 4.3 million people and 2.3 million jobs. This region is home to several key export industries to include aerospace, information & communication technology, and maritime. Significant challenges identified include addressing inequities in economic opportunity - people of color in the region face disproportionate and unique barriers to economic success - and addressing workforce gaps in high demand occupations and industry sectors.

St. Louis: The St. Louis Economic Development Partnership encompasses St. Louis city and county and is home to nearly 2.8 million people and roughly 1.04 million jobs, though this number has declined over the years. The area's key industry sectors are health sciences and services, bioscience (plant and biomedical sciences), financial and information services, and multimodal logistics and advanced manufacturing. Weaknesses, opportunities, and threats identified include lack of equity and inclusion of opportunity, with poverty affecting minorities at a disproportionate rate and a need for an economic development network.

Huntsville: Top of Alabama Regional Council of Governments include Huntsville, Alabama and is home to roughly 675,000 Alabamans. Top industry sectors include aerospace and defense development, bio- and robotics technology. A significant workforce challenge is that the education system is not producing students with the level of skills needed for today's advanced manufacturing. A goal is to develop a highly skilled workforce with the ability to re-tool the existing regional workforce as necessary to address the ever-changing global economy

Workforce development is a common thread in the CEDS reviewed across all known regions impacted by this funding opportunity, specifically a resilient or tech-heavy workforce. Many regions are still reeling from the impacts of COVID-19, in some regions - such as St. Louis and Alabama - these impacts exacerbated declining workforces due to divestments over decades. Another common goal in these regions is to develop a more diverse and equitable workforce, improve opportunities for systemically under-represented groups in these areas and provide sustainable economic mobility through tech employment.

This grant funding will directly assist these regions with their CEDS goals. AWS, Boeing, and Apprenti will work with training providers, service and advocacy groups, and other stakeholders to develop systems to strengthen the tech talent pool, expand economic opportunity and assist displaced workers. As two of the top tech employers on the globe, AWS and Boeing will be

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[5] Central Puget Sound Regional Council Draft Regional Economic Strategy, 2021 (psrc.org)
St. Louis Economic Development Partnership 15120-CEDS-Report-Final.pdf (stlouis-mo.gov)
Top of Alabama Regional Council of Governments 2020-CEDS-Annual-Update.pdf (tarcog.us)

directly investing in the impacted regions' economy and workforce; bringing quality, high-paying jobs in a competitive industry.

Section 4: Impacts of the Regional Workforce Training System Section

4.A. Project Proposal Overview

Problem Statement: In the five years Apprenti has existed as an industry intermediary, its systems are based on the direct needs of the sector. Approaching each company to understand how to systematize a scalable infrastructure has exceeded initial expectations for numbers and economic mobility. However, the scale with which it needs to move to meet demand and become a stable part of the workforce infrastructure in the U.S. is simply too slow and inefficient. By building out Managed apprenticeship as a Service to address the needs of two sectors, leveraging their respective vendor and consumer networks, all needed systems rise at a faster pace, e.g., training providers through testing and train-the-trainer systems, funding through this grant to cover training expenses (RSI) for apprentices, employer outreach and communications strategy, networking of the workforce system to scale consistent apprentice support offerings, and, where possible, streamlining of the administrative process for apprenticeship.

Boeing:

Phase 1 - System Development & Initial Program Design [July 2022 - November 2022]
Candidate Sourcing – Initial structure and messaging developed 2022, delivery is ongoing

- Expand outreach to underrepresented groups including women, veterans, people with disabilities, and COVID displaced groups. Boeing will provide community organizations with a free Foundational Tech course to help build confidence in the system and the offering.
- Build pathway for individuals enrolled in Boeing's Future of Learning program to enter apprenticeship program.
- Boeing will identify internal staff that may be capable of Cyber work for reskilling
- Leverage the communications strategy content, speaking with aviation and aerospace employers, to reach media and community-based organizations to help educate communities about the potential apprenticeship offers.

Technical Training

- Build a foundational tech course or pre-apprenticeship program to equip potential applicants with a basic level of knowledge on networking and operating systems prior to starting the apprenticeship program.
- Invest in a comprehensive Learning Management System (LMS) to track RSI progress.
- Update the Cybersecurity curriculum
- Design and begin the build out of a 'Black Box' environment for trainees. This is a closed code system that allows apprentices to see an imminent threat and take the steps necessary to engage, document and close a cyber threat. While the blackbox will be designed for Aerospace use, this Cyber environment will also be made available to higher education institutions for use based on availability.

Boeing Apprenticeship Infrastructure
- To support the development, implementation, and scale of this system, additional personnel will be required. Personnel include – Program Manager, HR focused on apprentice program operations / non-traditions, and apprenticeship program coordinators.
- Develop new processes in legal and HR for job requirements, screening of candidates, soft skills, interviewing, onboarding, and retaining apprentices.
- Validate the occupational filings for Cyber, based on the NICE/NIST competencies. Evaluate and improve as delivery is refined from cohort to cohort.
- Reclassify/create new job requisition for each apprentice-able role. Initial Cyber roles are posted on - LinkedIn, S&FP and PSE job with clearance, ITDA job without clearance wording.
- File Boeing sponsored Software Development and Cyber Security standards

Phase 2 - Program Implementation & Expansion [November 2022 - April 2023]
- After initial pilot of 100-150 apprentices in Cyber and Software Development, Boeing will expand to additional technology roles internally and increase number of apprentices.
- Boeing will leverage its certified training program in apprenticeship to its vendor ecosystem to allow for blended cohorts to scale faster.
- Boeing will lead outreach to potential hiring partners in the aviation industry using communications strategy developed during Wheelhouse change management consult.
- Extend the Boeing training program to other DOD collaborators and training providers to ensure capacity to meet demand.
- Place 600 apprentices in Cybersecurity and Software Development across 10 hiring partners beyond Boeing's direct hiring.

Phase 3 - Program Sustainability [May 2023 - December 2024]
- Expand Managed apprenticeship as a Service offering across aerospace aviation.
- Develop an MaaS playbook to assist employers with adoption.
- Complete delivery of 1,000 apprentices through Boeing and the aerospace sector to ensure continuation of use beyond the end of the grant.
- Employers pay a small one-time fee per apprentice for sourcing, placement, and management. This makes staffing and related program expenses sustainable beyond the grant to ensure the system's survival as a service.

AWS:
Phase 1 - System Development [July 2022 - November 2022]
- Build on the existing internal veteran hiring program at AWS and leveraging the knowledge acquired thus far to identify key attributes in potential hiring partners.
- Develop communications strategy for educating employers on the AWS platform about apprenticeship – the value and responsibilities in delivery.

- Apprenti will expand relationships with community-based organizations and colleges that serve minority groups including women, veterans, people of color, covid-displaced, and persons with disabilities.

Phase 2 - Program Design [November 2022 - April 2023]
- Start pilot program with Robert Half and InfoSys to create a new pool of AWS Cloud talent. Pilot program will provide key learnings needed to scale to additional cloud employers across the US.
- AWS will help colleges accelerate their AWS certified learning models.
- Apprenti will engage with Wheelhouse Group to support process development, refine communication strategy, and record best practices with AWS and Boeing. Eliminate friction for non-traditional employers to hire non-traditional talent.

Phase 3 - Project Implementation [May 2023 - December 2024]
- AWS will leverage its certified training program in apprenticeship to its vendor ecosystem to allow for rapid consumption and deployment of talent.
- AWS will lead communications and partner on outreach to potential hiring partners on the AWS platform.
- Extend the AWS training program to other cloud collaborators and training providers.
- Develop an "Apprenticeship as a Service playbook" – including all resources required to make MaaS programmatic and scalable.
- Hire 300 apprentices and place an additional 700 apprentices across the cloud ecosystem. (Robert Half and InfoSys having committed to 600 total toward the remaining 700)

4.B. EDA's Recovery and Resilience
This project will directly meet four of EDA's investment priorities - recovery & resiliency, equity, workforce development, and technology-based economic development.

Recovery & Resilience: The impacts of this grant proposal will be realized by the newly trained workforce, the employers, the regions, the nation, and the greater industry ecosystems. Successful recovery and resilience generally require the ability to bounce back from and adapt to disruptions, both physical and economic. Unlike location-based industries, i.e., coal mines or power plants, many technology professions are 'teleworkable' allowing employers and employees to pivot and adapt to disruptions.[6]

The tech sector not only sustained operations during the pandemic but significantly expanded business as more consumers were driven to use their services. For example, a study by Fortune Business Insights indicates the cloud computing market grew to USD 250 Billion in 2021 and is

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[6] Executive summary | Strengthening Economic Resilience Following the COVID-19 Crisis: A Firm and Industry Perspective | OECD iLibrary (oecd-ilibrary.org)
The-Trade-Offs-of-Remote-Work.pdf (aei.org)
Microsoft Word - 5768_ERP_EDQ2_v05.docx (edc.nyc)

expected to reach USD 791 Billion by 2028.[7] This significant growth is the result of organizational reliance on cloud-based solutions in response to the pandemic and is indicative of the tech sector's agility to meet the ever-changing needs of its consumers.

This grant funding will provide Boeing and AWS a federal partnership in this continued and certain global market growth by investing in training and upskilling labor in all regions across the United States. The resultant resilient and adaptable workforce will feed into and strengthen local and national economies. Additionally, apprenticeship and industry recognized certifications are portable. This helps sustain apprentices as they move around, between states and industries, in their careers and offers employers a consistent measurement of competency to consume.

Equity: Apprenti is passionate about assisting the technology industry advance equity, diversity and accessibility initiatives, particularly when it comes to investing in and hiring from historically underrepresented populations. This project will expand upon Apprenti's efforts in diversifying the technology workforce - Please see attached 5 Year Performance Summary for more detailed data on Apprenti's diverse applicant and apprentice pool.

Geographically speaking, although Apprenti, Boeing, and AWS are based out of Seattle, this funding opportunity will develop skilled labor in at least two persistent poverty counties: St. Louis, MO and Huntsville, AL. As previously noted, other pilot locations will include: Houston, TX, Herndon, VA, Louisiana and Southern Nevada.

Workforce Development: The primary intent of this grant funding is workforce development - Apprenti, Boeing and AWS will create/expand registered apprenticeship programs to train diverse, non-traditional talent. Both companies are committed to hiring and working with industry to adopt apprenticeship and hire employees in well-paying, quality jobs.

Technology-Based Economic Development: Boeing and AWS are tech sector powerhouses who create, support and influence several ecosystems. This funding will tap into and bolster that influence, increasing skilled labor to the benefit of the regions and employers within their sphere of influence. These jobs are highly marketable, high-skilled, well-paying and are not only sustainable into the future, but are leaders of the future workforce.

4.C. Job Information: Number, wages, and benefits
These apprenticeship programs will train employees for well-paying, quality jobs which typically meet or exceed the local prevailing wage for most regions, and include basic benefits such as paid leave and health insurance. These positions will also receive ongoing growth and development opportunities providing career advancement earned credentials that are industry recognized and likely career paths, not dead-end jobs.

As noted previously, the national average wage for Cyber Security professionals is about $63,000 and $68,000 for Software Development roles. Boeing positions' midpoint is

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[7] https://www.fortunebusinessinsights.com/cloud-computing-market-102697

approximately $75,000 for cybersecurity professionals. The starting target salary for Boeing apprentices will be a minimum of $45,000 and apprentices will get step increases as training progresses - $52,500 (70% completion) and $60,000 (80% completion). In addition to a competitive salary, Boeing will provide the same benefits offered to employees including union membership, market-leading health and retirement plans, generous tuition assistance, paid time off, and programs that support the apprentice and their family[8].

The national average salary for a AWS Cloud Administrator is $87,249 (glassdoor.com). Like Boeing, AWS will provide a training wage that's 60% of the target end salary, with a wage step increase at 1,000 hours. AWS will offer apprentices benefits that are equivalent to employees.

4.D. Achievability
Apprenticeship is a workforce development system; it is a time-tested, combining classroom learning with on-the-job training and has trained generations of employees in various professions including electricians, lawyers, doctors, and accountants. Using apprenticeship as a training methodology is relatively new to the information technology sector in the U.S., but Apprenti has successfully trained and placed over 1700 apprentices at over 100 employers since 2016. The Managed apprenticeship as a Service model is a variation on the existing program that expands the reach of apprenticeship faster, addressing specific employment needs, while leveraging an existing consumer/vendor network, i.e., the next logical step beyond the current system.

This MaaS model has already been tested with Zoho, a CRM system that competes with Salesforce. On a smaller scale, Apprenti piloted this model in the second half of 2021 in partnership with a certified Zoho training partner. This test resulted in 35 apprentice placements inside 14 companies with a tailored training model. Companies in this limited offering signed on faster than traditional new hire companies, understood the offer of apprenticeship easier, as it tied to the platform, and apprentices were able to work nationally on a remote basis. Employers hiring Zoho Administrators are now seeking apprentices in additional roles - expanding adoption and offering growth to the system based on their platform experience.

In recent years, other tech and tech adjacent companies like Microsoft, Wayfair, Kroger Industries, Procter & Gamble, and F5 have successfully developed, recruited and trained skilled labor for growing vacancies[9] with Apprenti's support. Now, Boeing and AWS will be added to the growing list of tech companies to use apprenticeship but expanded to serve an industry, not just a company using the lessons learned in the Zoho pilot.

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[8] For more on Boeing benefits please visit Benefits (boeing.com)

[9] Why Microsoft is Hiring Apprentices and You Should Too - Apprenti (apprenticareers.org)
Why Your Company Needs Apprenticeships | WTIA Blog (apprenticareers.org)
Tech apprenticeships may just be the future of workforce development - Technical.ly
Technology Apprenticeships: A New Way For Entry Level Talent To Jumpstart Their Careers Post High School (forbes.com)

4.E. Participant Demographics & Stakeholder Groups

Participants are over the age of 18, from diverse and underrepresented backgrounds, from regions across the country. Beyond our diversity targets, additional focus will be placed on outreach to dislocated workers, under employed and those engaging in the "Great Resignation" looking for a new opportunity.

In recent conversations with the HBCU's, the plethora of opportunities is giving rise to concern that students will leave for jobs, but not return to complete degrees. To mitigate this, not only for HBCU's, but also community colleges who supply a highly diverse applicant pool, Apprenti is working with Alcorn State and Tennessee State University to identify potential for credit related to RSI and OJT. The goal being to graduate students who leave early for employment opportunities by offering prior learning credit for apprenticeship education and related work.

Further, Apprenti has partnered with Ascendium Foundation to map its apprenticeship standards to higher education and degree attainment. In partnership with Northeastern University, the role of Software Developer may be able to complete two full years of college. As employers are offering tuition reimbursement as a rich employment benefit, apprentices may be able to complete their degree with NEU online, with only two years remaining, that their employer will financially support. Impact is still low in numbers, however, as the placements increase, it could create a vacuum at the college level.

5: Funding Request and Program Design and Implementation

5.A. Funding Request Overview

The estimated funding request for this grant proposal is $25million over three years split out as follows: Year 1 - $4,541,264;   Year 2 - $8,028,570;   Year 3 - $12,430,265.

Year 1 will largely cover system development and program design to include: hiring staff to finalize and operationalize grant components, secure training and partnership commitments, and plan, strategize and prepare to build a training and testing environment for Cyber Security.

Year 2 costs increase as programs transition from program design to implementation across all regions. This will include finalizing creation of the training environments and hiring several instructors through Rapid Ascent to provide training.

Year 3 costs reflect the full implementation, stabilization and sustainability of the apprenticeship programs. All instructors are hired, all systems and relationships identified in prior years are solidified and apprenticeship programs operating at full cohort capacity as Apprenti works with AWS and Boeing to continue expanding into new roles and regions.

Please see Budget and Budget narrative for full overview of the total project budget to include staffing plan.

5.B. Anticipated System Development, Program Design and Program Implementation

Apprenti's existing infrastructure supports the outreach structure needed to reach target diverse populations. The funding included in this budget and across the Development and Implementation phases of this plan are to scale that outreach to more locations, build active community messaging campaigns and a communication strategy for employer outreach that both Boeing and AWS will execute in partnership with Apprenti and the hires being made with the proceeds of this grant.

The creation of a dedicated black box training environment will be utilized by Rapid Ascent, Virginia Tech and other higher education training partners as part of the systems development and program design will be iterated over time and informed by best practices. Curriculum development is already in process with Rapid Ascent as Boeing's first pilot cohort will start before this grant is awarded, and AWS already has a certified training curriculum for Cloud Operations that is periodically reviewed for improvement. The design and implementation phases for both employers will benefit from significant RSI subsidy, i.e., the funding not always available through public means or as a support to get new employers to engage in piloting apprenticeship more quickly. Based on five years of experience, the training cost is one of the greatest barriers to sustained employer engagement. Creation of an apprenticeship funding strategy consistently available for 10+ years is a desired outcome of this grant.

As outlined in section 4.A., this grant funding will include system development, program design, and program implementation. The AWS and Boeing registered apprenticeship projects will cover all three elements just in different phases and will incorporate the specific needs of each of the region's programs operate. Some key performance indicators for the registered apprenticeship programs include:
- Minimum of 2,000 placements total for grant funding
- Commitments to carry on and expand placements beyond end of grant
- Sustainable fee structure to make programs self-sufficient long-term
- Leveraged Workforce Development System approach to standardize support/subsidy from WIOA to carry on RSI funding both during and beyond end of grant
- Minimum of 75% diverse populations – women, veterans. persons of color, persons with disabilities, encompassing dislocated workers
- Median wage of $50,000 during apprenticeship; over $75,000 post apprenticeship
- More than 75% of eligible employers returning to apprenticeship to hire a second time
- Greater than 80% retained in industry post apprenticeship
- Greater than 90% RSI completion rate

5.C. Anticipated Participation Barriers, Wraparound Services & Sustainability

The strategy for recruitment and selection of apprentices includes outreach to a broad range of minority serving organizations and workforce agencies, adopting selection procedures that minimize barriers to apprenticeship, and incorporating anti-bias interview techniques. WTIA's DEI Office leads and supports the creation of anti-racist, multicultural organizations where equity is deeply rooted and sustained in workplaces and communities served. To accomplish this work, best practices and hiring solutions are shared with companies working to advance their

DEI journeys. For this grant funding, Apprenti will work with above noted organizations (2.B) and provide professional coaching on culture change and the structural and operational changes companies must examine and shift to hire and retain a strong, diverse workforce.

Wraparound Services

Apprenti provides employers with coaching on new interview systems -focused on skill sets and soft skills - think competency over pedigree. Further the system employed works to strip away as much of the inherent bias in the hiring systems by not providing a resume, prior work experience or educational attainment. Instead Apprenti works with companies to understand what makes an employee successful in their organization, identifies skills that employers see high value in, and works to bring candidates who meet those objectives. Just as apprentice candidates enjoy some coaching on the office environment they will be working in, companies and mentors benefit from coaching on inclusivity, managing people differently to eliminate unrecognized micro-aggressions and joint coaching/management of the mentor and apprentice throughout their year together to ensure expectations are clear and met.

For apprentices, Apprenti works with Workforce Boards to ensure apprentices receive the day to day support they need to be successful in their jobs. Apprenti is VA certified as are its training partners to ensure Veterans can access post 9/11 GI Bill benefits for increased living costs and other systems they may need. Apprenti does not duplicate services already offered in the public domain, rather choosing to fill the gaps where needed and allow the subject matter experts in their respective areas do what is needed on a referral basis.

Sustainability

Though Apprenti is a 501c3, it was important from day one that outcomes of the apprenticeship system yield economic mobility for underrepresented populations placed into tech roles, as well as, the company creating enough earned income to be operationally self-sufficient. In 2021, just five years into operating, Apprenti was .33 cents on the dollar self-funded. As the program grows, all revenue is reinvested back into scaling the operation. Where the first apprentices in 2016 cost $27,000 per person to place, excluding RSI, the cost is now down to $8,400 and declining with efficiency as placements grow.

This grant will aid in scaling the business operation, which will in turn create a revenue stream through placements. The earned income for 2,000 placements will meet the cost outlay of the staff hired by the end of the grant. Of the overall $25M requested, the bulk of the cost is directed at RSI and training delivery and the one-time cost for development of the black box testing environment. These are expenses that, during the grant, Apprenti will seek to replicate more sustainably through the Workforce System and WIOA. After a period of stability following program implementation, a fee structure currently in use with employers will be implemented to ensure the registered apprenticeship programs are sustainable beyond grant funding.