NEW
AMERICA

TECH APPRENTICESHIP IN THE SAN FRANCISCO BAY AREA

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1. Introduction

The nine counties of the San Francisco Bay Area enjoy the greatest advantages of the innovation economy. The Bay Area accounted for nearly $1 trillion in economic productivity in 2018; the only metropolitan area with a higher per-capita gross domestic product was oil-rich and comparatively tiny Midland, Texas**(1).** Unemployment in most Bay Area counties is less than 2.5 percent. **(2)**"The city is filthy rich in what other regions crave," wrote the *Washington Post* last year: "Growth, start-ups, high-paying jobs, educated young people, soaring property values, commercial and residential construction, a vibrant street life, and so much disposable revenue." **(3)** But the Bay Area's tech economy also gives rise to its worst afflictions.

Costs of living are higher than anywhere in the country, pricing low- and middle-income residents out of housing near the strongest job markets. Gig services provided by ride-sharing and delivery companies worth billions of dollars strain public infrastructure and depend on legions of low-wage workers clocking extreme hours. And to maintain their pace of innovation, Bay Area tech companies compete fiercely for talent, paying top wages to attract the best recruits—whether they hail from the other side of the country or the other side of the globe. The prospects for many local residents are bleak, and the stakes are high. "We're living in a Jetsons economy and a Downton Abbey society," says Luther Jackson of NOVA, a regional training and employment agency based in Sunnyvale, a 10-minute drive from a corporate campus where thousands of Facebook, Microsoft, Google, and Amazon employees work.

Though the Bay Area's tech economy is unlike any other in the United States, city and county governments in the region face the same challenge of creating pathways to

well-paid careers for their residents. And like many other large cities, San Francisco has turned to apprenticeship as one of its tools. A broad array of stakeholders and organizations have supported tech apprenticeships over the past several years, drawing on a long history of successful sector strategies **(4)** and apprenticeship expansion efforts in other fields. But the Bay Area's tech economy is difficult terrain for apprenticeship development, with unique administrative, organizational, and programmatic challenges. These challenges, and the strategies adopted in response by the San Francisco city government and other regional partners, deserve the attention of other municipal leaders looking to support IT career pathways in their own cities.

2. TechSF: A sector approach to support apprenticeship

San Francisco's approach to tech apprenticeship expansion is led by TechSF, a sector initiative established in July 2012 with support from U.S. Department of Labor (USDOL) grants totaling $8 million. Implemented by the city's Office of Economic and Workforce Development (OEWD) in partnership with a dozen community and educational partners, TechSF provides employer engagement services, pre-apprenticeship training, and financial incentives to support ongoing mentorship for the apprentices and other trainees it places with tech employers.

Though TechSF did not start off as an apprenticeship initiative, when it began to develop IT apprenticeship programming in 2015—helped by a $2.9 million USDOL American Apprenticeship Initiative grant—OEWD drew on the successes of San Francisco's CityBuild Academy, the flagship of San Francisco's sector academies model. Since its founding in 2006, CityBuild Academy has provided training and support services to help hundreds of local job seekers enter well-paid construction career pathways, often starting with apprenticeship.

Like many other large cities, San Francisco has a healthy tradition of apprenticeship in the building trades, as well as in hospitality, healthcare, and among municipal employees. Unions in these sectors serve as valuable apprenticeship allies, and their importance in San Francisco's political landscape has led successive city governments to support policies that invest in apprenticeship pathways, including the First Source Hiring Program **(5).** But apart from a few recent efforts, unions are rare in the tech industry. So in adapting its career academies model to suit tech training, including apprenticeships, San Francisco's first challenge was to figure out how to encourage some of the world's pickiest employers to try apprenticeships at all—without the helpful lever of organized labor.

The tech sector's lack of collective bargaining agreements means that it often feels like TechSF is starting apprenticeship collaborations from scratch, admits Joshua Arce, OEWD's director of workforce development. But it's made easier, he says, because tech employers have severe talent problems, and they know it.

Their first problem is that skilled tech workers are expensive to find and recruit through the usual channels. Despite the tech sector's ethos of self-education and "figuring it out," most developers, engineers, and tech managers globally have a bachelor's degree or better **(6).** In San Francisco, the world's most competitive tech labor market, those degrees often come from computer science departments at prestigious colleges, and command a high wage premium. The second talent problem derives from the first: owing to the significant financial and cultural barriers that restrict access to bachelor's programs in computer science, technical employees, managers, and executives in the tech sector are mostly male, and largely white or Asian **(7)**.

Research suggests that diverse teams carry out innovation- and knowledge-based roles more effectively than teams where one race or gender is overrepresented **(8).** Whether that evidence factors into tech companies'

recent focus on diversity and equity in their hiring strategies is unclear. What is certain is that Bay Area tech companies are increasingly conscious of the male and pale complexion of their technical workforce, and increasingly sensitive to the perception that they do not pull their weight in creating opportunities for Black and Latinx local job seekers who might not be able to enter tech careers through the usual higher education avenues. Though TechSF's apprenticeship work is still at an early stage, the model is gaining traction with employers who know that hiring-as-usual is no longer sustainable, either economically or politically.

3. Community organizations and the tech apprenticeship pipeline

Firms like Twitter, Airbnb, and Twilio have already engaged TechSF as a partner to help make their job opportunities more locally accessible through apprenticeship. But the challenge of tech apprenticeship expansion in San Francisco and the broader Bay Area isn't just one of coordination and advocacy. Prospective tech apprentices need to build a significant base of skills before they even get in the door, so the pre-apprenticeship functions of TechSF's community-based educational partners are critical.

As with university programs in computer science, access to secondary level coursework in computer science is inequitably distributed. A June 2019 report by the Kapor Center found that only 39 percent of high schools in California offered computer science coursework; an earlier report from the Level Playing Field Institute found that Californian schools with the highest percentages of students of color were half as likely to offer computer science (CS) as those with the lowest percentages of students of color **(9).** Recently, California has made policy progress towards universal access to CS courses through

its statewide Computer Science Strategic Implementation Plan, but according to Abel Regalado, a former apprentice now working as a software engineer in Redwood City, many Bay Area school districts still only have a few "islands of excellence" where CS is taught.

As a result, aspiring apprentices who don't have access to CS courses face a long and potentially costly road to apprenticeship-readiness. Regalado, for his part, strung together half a dozen preparatory coding experiences—a high school coding club he founded, a summer exploration academy run by Hack the Hood, a stint at community college, and a few coding boot camps—before he began his apprenticeship in spring 2019. "To even be prepared for programs like Hack Reactor," the well-respected boot camp Regalado attended on a Kapor Center scholarship immediately before his apprenticeship, he says, "it can't be like 0 to 100 right away. You should know 40 percent of it, the basics, the fundamentals, before you start."

To get to 40 percent before Hack Reactor, Regalado took courses at Mission Bit, one of TechSF's educational partners. Staffed by volunteer CS majors from local colleges and offered free of charge to high school students in poverty-affected Bay Area communities, Mission Bit, along with TechSF's 11 other educational partners, plays a key role in creating viable pathways to tech apprenticeship for Bay Area residents who may not have access to foundational CS coursework in high school.

Another new tech apprentice employer, the gig delivery firm Postmates, has worked through TechSF to hire three apprentices from Dev/Mission and Upwardly Global, two other TechSF educational partners. "It was kind of the perfect storm: we were growing like crazy, and it made sense to do more with these relationships we already had with Dev/Mission and the mayor's office," says Claire Sands, a communications director at Postmates who helps lead the company's training and upskilling strategies. "It was amazing to see [Dev/Mission's] talent pool be so capable, and so hire-ready."

Leonardo Sosa, the founding director of Dev/Mission, has helped over 100 young Bay Area residents through Dev/Mission's three-tiered training programs since 2017, and alongside Postmates, he also counts Google, Uber, Twitter, and Airbnb among his partners. "We're telling the tech industry, 'Hey, we're doing something really cool and exciting; you're cool and exciting, and if you don't do this, I guarantee your CEO or CFO is going to wonder why,'" Sosa says of his engagement strategy. "On top of that, let's keep it real: you're here in San Francisco, in our neighborhoods—gentrification is real. How can we get you engaged?"

By providing free, accessible pre-apprenticeship class-rooms and another voice in the employer engagement process, community-based partners like Dev/Mission are essential to ratcheting up the participation of tech employers in the apprenticeship system that TechSF aims to build.

4. Conclusion and outlook

Building on an existing strategy of employer engagement and accessible, adaptable training through community partners, TechSF has been able to start a sector-wide conversation about apprenticeship expansion. Though there's a long way to go in creating equitable entry-level pathways with a critical mass of tech employers, "companies are starting to reimagine how they can develop talent," says TechSF program officer and Apprenticeship Bay Area lead Krysti Specht.

From a policy standpoint, tech apprenticeship expansion in the Bay Area faces additional challenges on the horizon. The first is that Bay Area tech apprenticeship has quickly moved from having only a few champions to many. A growing number of tech employers, as well as two nascent regional apprenticeship coalitions **(10)**, now serve as tech apprenticeship evangelists. This is a good problem for the moment, but as tech apprenticeship

grows, the Bay Area will increasingly benefit from a single driving vision that can harmonize regional workforce priorities across its nine counties. A second major policy issue is sustainable funding. Although Bay Area apprenticeships benefit from California's well-designed statewide apprenticeship tuition reimbursement system, **(11)** TechSF's staff and mentorship incentives, as well as a portion of its educational partners' free pre-apprenticeship services, are funded through federal and state grants. A regular city budget appropriation may be necessary to keep TechSF running, to say nothing of its educational partners. "I don't want this to fail because the nonprofits don't have funding to make it happen," says Sosa.

Luckily, there are policy opportunities in sight for tech apprenticeship, too. Governor Gavin Newsom has set a statewide goal of reaching 500,000 apprentices by 2029 **(12)**, and TechSF's director Arce sees his organization as a way for San Francisco to do its part. Recently, TechSF's apprenticeship work has also gotten more attention in city government. Mayor London Breed has committed to placing 300 apprentices in tech occupations by 2021, and an apprenticeship for IT generalists is now approved for use in the 60 departments of San Francisco's city government—by far the Bay Area's largest employer.

Apprenticeship will not solve all of the Bay Area's challenges in equitable development, but it's shaping up to be one important policy tool among many others. Above all, the new crop of tech professionals coming up through initiatives like TechSF provide grounds for optimism about equitable workforce development in the tech sector. "If tech is left to do what tech has always done, then tech won't change," says Sands. "It's important that we make space for critical voices on the inside." Tech apprenticeship is helping make space in some of the world's most profitable companies for Bay Area residents who haven't had it before.

Notes

1)   According to Bureau of Economic Analysis figures., the combined 2018 GDP of the San Francisco–Oakland–Berkeley and San Jose–Sunnyvale–Santa Clara metropolitan statistical areas (MSAs) was approximately $880 billion. Divided by the population of each MSA, this produces a per-capita GDP of $116,000 and $166,000, for the San Francisco and San Jose MSAs, respectively. Variables: CAGDP2 (BEA) and respop72018 (Current Population Survey).

2)   Of the nine Bay Area counties (Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma), only Solano County's unemployment rate exceeds 3 percent. See State of California Employment Development Department, "California Unemployment Holds at Record Low 3.9 percent in December," press release, January 24, 2020.

3)   Karen Heller, "How San Francisco Broke America's Heart," Washington Post, May 21, 2019.

4)   According to the Ray Marshall Center for the Study of Human Resources at the University of Texas, Austin, a sector strategy is "a partnership of employers within a critical industry that brings together education, economic development, workforce systems, and community organizations to identify and collaboratively meet the workforce needs of that industry within a regional labor market." Heath Prince, Chris King, and Sarah Oldmixon, "Promoting the Adoption of Sector Strategies by Workforce Development Boards under WIOA," Ray Marshall Center, accessed February 28, 2020.

5)   San Francisco's First Source local hiring provision was enacted in 1998 under Chapter 83 of the City Administrative Code. In the construction sector, contractors on public contracts worth $350,000 or more, or on private developments for the construction of ten or more residential units, must work with CityBuild to provide apprentice positions for local workers. "First Source Hiring Program Overview," San Francisco Office of Economic and Workforce Development, accessed February 25, 2020.

6)   A 2019 survey conducted by Stack Overflow of nearly 90,000 developers worldwide found that over three-quarters of developers had a bachelor's degree or higher. Among respondents who had a university degree, over 60 percent majored in computer science. "2019 Stack Overflow Developer Insight Report," Stack Overflow, accessed February 25, 2020.

7)   A 2018 analysis of the 2016 EEO disclosures of 177 Silicon Valley tech firms by Reveal and the University of Massachusetts–Amherst Center for Employment Equity found that white and Asian men made up about 65 percent of the tech workforce at professional and managerial levels, and 75 percent of executives. Latinx workers made up less than 5 percent

of the professional and managerial workforce, and 3 percent of executives; Black workers accounted for less than 3 percent of professional and managerial positions and less than 2 percent of executive positions. Sinduja Rangarajan, "Here's the clearest picture of Silicon Valley's diversity yet: It's bad. But some companies are doing less bad," Reveal News from the Center for Investigative Reporting, June 25, 2018.

8)   For a summary of recent studies on this topic, see David Rock and Heidi Grant, "Why Diverse Teams Are Smarter," Harvard Business Review, November 4, 2016.

9)   See Allison Scott, Sonia Koshy, Meghana Rao, Laura Hinton, Julie Flapan, Alexis Martin, and Frieda McAlear, Computer Science in California's Schools: An Analysis of Access, Enrollment, and Equity (Oakland: Kapor Center, June 2019); and Alexis Martin, Frieda McAlear, and Allison Scott, Path Not Found: Disparities in Access to Computer Science Courses in California High Schools (Oakland: The Level Playing Field Institute, 2015).

10) The two coalitions are Apprenticeship Bay Area, which is being developed with the support of TechSF, NOVA, and funding from USDOL and the California Workforce Development Board's SlingShot 2.0 grant initiative; and the Bay Area Council's Workforce of the Future initiative, supported by the business services firms Aon, Accenture, and SAP, as well as the Irvine Foundation.

11) For more information on California's related and supplemental education reimbursement model, see Michael Prebil, Solid Foundations: Four State Policy Approaches for Supporting College-Connected Apprenticeships (Washington, DC: New America, September 2019).

12) See Gov. Newsom's 2018 economic agenda, "Here's How We Grow California's Economy for Everyone," February 8, 2018.