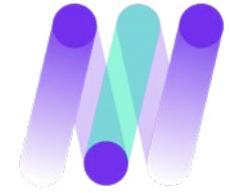


Miami Tech Works



Miami Tech Works

Gap Analysis



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Executive Summary

Introduction

Over the past several decades, Miami-Dade County has grown to be the home of numerous thriving tech companies. From Amazon, Microsoft, and Google, to Blackstone, SAP, eMed and Kaseya, tech companies enjoy substantial infrastructure to escalate their services. Despite the growth of the tech industry, community members, workforce development partners, educational institutions, and community-based organizations have faced difficulty connecting local job seekers to meaningful careers with these thriving tech companies.

The Partnership for Miami recently published *Miami 2035: A Miami That Works for All*.¹ This report provides an analysis of the current state of Miami in comparison to 20 domestic peer cities and 10 international peer cities and outlines opportunities for Miami to continue to thrive. As it relates to this report, this report found that Miami ranks among the fourth out of the 20 US peer cities with 51 percent of pre-school-age students enrolled, a public school system that ranks first among the nation's five largest city school districts (Miami-Dade, New York, Los Angeles, Chicago, and Clark County), but low teacher compensation, unsatisfactory performance of third and eighth graders performing at or above grade level, and one of the lowest rates of post-secondary education attainment. It is important that Miami-Dade County builds on these identified opportunities and ensures that students are prepared to be competitive in the modern workforce. This report will delve into recommendations strategies that educational institutions, local government, workforce development organizations, community-based organizations, and employers can support this effort and strengthen the tech talent ecosystem.

Miami Tech Works

Miami Tech Works, based in South Florida, is powered by a \$10 million grant from the U.S. Economic Development Administration's Good Jobs Challenge. This initiative is pivotal in addressing tech talent gaps. The gap analysis team has been tasked with conducting a comprehensive analysis to support this effort. By 2025, Miami Tech Works aims to train over 1,000 residents and ensure at least 500 secure high-quality tech jobs. Their initiative collaborates with local institutions and employers, focusing on integrating academic and real-world tech demands, addressing the tech skills gap, and promoting inclusivity. This support significantly enhances efforts to equip the local workforce with the necessary skills and connect them to meaningful tech careers in South Florida.

This tech talent gap analysis is designed to leverage public data, and perspectives from job seekers and various stakeholders across the tech ecosystem, to understand if there is a gap in talent across Miami-Dade County and the surrounding region and identify solutions to better connect local job seekers to meaningful jobs with employers across the county. The recommendations focus on identifying opportunities and methods of creating systems to help connect local job seekers to careers with regional employers.

The gap analysis was conducted over a five-month period. Various activities to complete the analysis include a review of local and regional workforce planning documents such as *Miami-Dade County 2040 Talent Development Goals and 2024 Miami-Dade Education and Workforce Development Survey*; an environmental scan using labor market information, a summary of tech education programs, career pathways, and an analysis of target sectors, industries and occupations; a stakeholder engagement process of interviewing employers, education providers, industry organizations, and distributing a job seeker survey; and a gap analysis of target tech jobs at a sub-sector level, understanding current workforce shortages, and training and certification disparities.

1 Partnership for Miami – A Miami That Works for All: <https://partnershipformiami.com/wp-content/uploads/2024/04/Miami-2035-A-Miami-That-Works-for-All-SML.pdf>

Gap Occupations

One of the primary purposes of this project was to leverage various data sources to understand if there is a current or will be a future shortage of tech workers and to identify what that shortage, or surplus, will look like over the next five years. To conduct the gap analysis, data were pulled from multiple sources including the Occupational Employment and Wage Statistics program (BLS), Classification of Instructional Programs (NCES), Standard Occupational Classification (BLS), Integrated Postsecondary Education Data System (NCES), and Post-Secondary Employment Outcomes program (Census). This information was organized and analyzed to understand the number of graduates that are being produced in a specific geographic area, whether or not those individuals are employed by local businesses, and the gap in number of jobs available and number of graduates provided by local institutions.

The findings from the gap analysis are as follows:

No Supply Gap of Workers:

- Sales Managers (SOC 11-2022)
- Architectural and Engineering Managers (SOC 11-9041)
- Computer Hardware Engineers (SOC 17-2061)

Significant Supply Gap of Workers:

- Computer and Information Systems Managers (SOC 11-3021)
- Computer and Information Analysts (SOC 15-1210)
- Computer and Information Research Scientists (SOC 15-1221)
- Computer Support Specialists (SOC 15-1230)
- Database and Network Administrators and Architects (SOC 15-1240)
- Software and Web Developers, Programmers, and Testers (SOC 15-1250)
- Computer Occupations, All Other (SOC 15-1290)
- Data Scientists (SOC 15-2051)

The data show that there is a current gap in the number of job seekers coming from local educational programs entering into occupations with local employers under the “significant gap” category. Because employers still need to fill job openings within their organization, they are “importing” talent to satisfy hiring needs in these occupations. This information presents an opportunity for education providers, workforce development organizations, industry groups, and community-based organizations to better equip the local workforce with the knowledge, skills, and abilities to gain employment with regional employers.

This report provides a deep analysis of labor market information, career pathways, and information from stakeholders that will provide valuable information for groups interested in building a stronger tech workforce ecosystem.

Key Findings and Recommendations

The overall list of recommendations was generated by reviewing labor market information and the gap analysis and comparing that information with discussions throughout the stakeholder engagement process. This report provides four thematic recommendations along with suggested strategies outlining how entities including employers, higher education institutions, local government, and workforce development organizations can support efforts. A summary of the recommendations is included below:

Key Finding Themes



Build pathways into tech ecosystem for local job seekers



Support the tech industry sector partnership



Enhance and connect local training efforts



Generate employer buy-in and support

Suggested Strategies for Organizations

Employers: The findings underscore the importance of creating or enhancing internal training processes to bridge skill gaps among employees. While larger employers may have existing training programs, smaller to mid-sized companies need to invest more in developing robust training initiatives. Additionally, offering short-term “microinternship” opportunities can provide students with valuable hands-on learning experiences and help them acquire practical skills relevant to the workplace. It was reported that these opportunities seem to be underutilized. Furthermore, strengthening engagement with training providers and higher education institutions is crucial for fostering local talent development and ensuring a pipeline of skilled workers that meets the needs of employers across various industries. By collaborating with these stakeholders, employers can create thriving systems for continuous learning and talent acquisition, ultimately contributing to the long-term success of their businesses and the local economy.

Higher Education: Higher education institutions should prioritize developing workforce-relevant skills alongside traditional academic competencies. While critical thinking skills are important, there is a growing demand for graduates with practical skills that directly translate to the workplace. Therefore, institutions should allocate resources towards providing students with opportunities to gain hands-on experience through internships, practicums, and capstone projects. Additionally, leveraging alumni networks and collaborating with bootcamp programs can create stronger systems that provide connections to employers and additional training mechanisms for students and job seekers. By focusing on developing well-rounded graduates equipped with both technical expertise and soft skills, higher education institutions can better prepare students for success in the workforce and contribute to the economic growth of the region.

Local and Regional Government: Governments play a crucial role in supporting workforce development initiatives and fostering collaboration among key stakeholders. Strategically focusing the allocation of resources and funding to support the development of IT workforce training programs is essential for equipping local workers with the skills needed to fill high-demand roles in the tech industry. Moreover, creating strategic and well-implemented hiring incentive programs can incentivize employers to hire local talent and contribute to the growth of the local workforce. By serving as conveners of employers, education providers, and training programs, local and regional governments can strengthen coordinated efforts and ensure equitable access to job opportunities for all residents. Additionally, implementing attentive monitoring systems for the incentive programs can help ensure that companies are effectively serving the interests of local talent and promoting inclusive hiring practices.

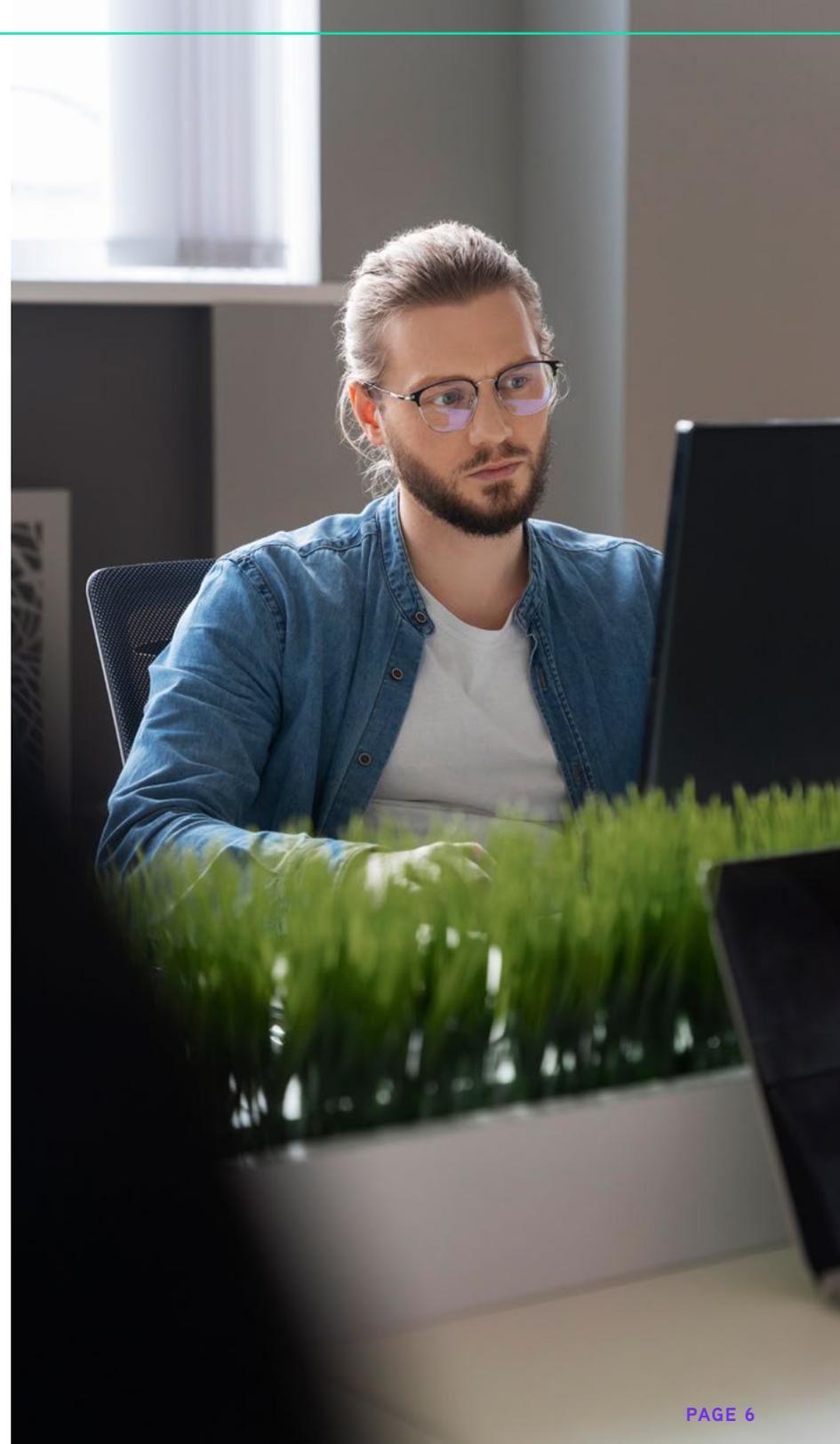
Workforce Training Providers: Workforce training providers have a unique opportunity to bridge the gap between education and employment by collaborating with employers and education institutions to develop robust apprenticeship and pre-apprenticeship programs. These programs can provide local job seekers, especially young individuals, with access to lucrative and meaningful career opportunities in high-demand industries. One example would be, expanding efforts to promote STEM and computer programming education in high schools can help prepare students for careers in technology-related fields. Workforce training providers can create pathways for local job seekers to access rewarding careers and contribute to the economic growth of the region by facilitating partnership with employers and leveraging resources from education providers and short-term training opportunities, such as bootcamps. Moreover, maintaining a robust tech industry sector partnership and enhancing access to training and job placement services can further support individuals in their career advancement and help meet the evolving needs of the local workforce.

Other Considerations: In addition to the key stakeholders mentioned above, there are several other considerations that warrant attention in addressing workforce development challenges and promoting economic growth from all groups. Improving the training pipeline for local job seekers is crucial, and stakeholders should explore innovative approaches such as using bootcamp training programs to support pre-requisite learning and facilitating better connections with the K-12 education system. Additionally, addressing affordability challenges and focusing on connecting job seekers to high wage occupations are essential for fostering a thriving local economy and ensuring equitable access to job opportunities. Last, it is imperative that regional employers buy into hiring local talent. This effort will require coordination and collaboration from all groups mentioned above to ensure local job seekers are equipped with the skills necessary to meet the needs of employers.

Limitations

In conducting a tech gap analysis across various industries, one significant challenge arises from the diverse nature of tech jobs that span multiple sectors, making it difficult to comprehensively capture industry-specific data. This diversity often results in variances in job titles, responsibilities, and required skills, complicating efforts to gather standardized data across industries. As technology evolves, new job roles emerge, while others become obsolete or undergo significant changes. This dynamic landscape poses difficulties in accurately forecasting future workforce needs and identifying emerging skill gaps. Furthermore, the gap analysis specifically used data sources such as BLS, NCES, and Census data because these data are validated by federal and state data management systems. Some of these data systems, specifically NCES's IPEDS data, only track credential attainment programs that utilize Perkins funding. Educational and professional development programs that do not report IPEDS data were not included in the metrics of this study. Therefore, it is likely there are significant amounts of job seekers with unreported credentials.

Furthermore, stakeholder interviews and job seeker surveys, while valuable for obtaining qualitative insights, come with their own set of limitations. Stakeholder interviews may be subject to bias or incomplete information, depending on the perspectives and experiences of the interviewees. Additionally, the availability and willingness of stakeholders to participate in interviews can vary, potentially affecting the representativeness of the data collected. Similarly, job seeker surveys may encounter challenges such as response bias and difficulty in reaching a representative sample, potentially skewing the findings and conclusions drawn from the analysis. Thus, while these methods offer valuable insights into perceptions and experiences, careful consideration of their limitations is essential to ensure accurate and meaningful results in the tech gap analysis.



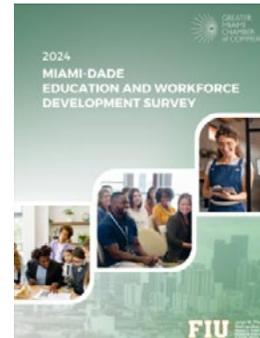
Previous Work



Miami-Dade County 2040 Talent Development Goals
Presented and sponsored by Opportunity Miami, Academic Leaders Council, CareerSource South Florida, and Miami-Dade Beacon Council, the Miami-Dade County 2040 Talent Development Goals Report (Miami 2040) iterates a lofty goal of having 65% of Miami-Dade County adults having at minimum an associate's degree or quality career credential by 2050, an increase of nearly 20% individuals with such credentials from when the report was initially published in February 2024.

This goal was identified through a rigorous research process and through comparison to peer cities such as San Francisco, Boston, Austin, Los Angeles, and others. The researchers acknowledge three avenues to accomplishing this goal: attracting talent, nurturing talent from childhood, and upskilling and re-skilling adult learners.

Since the COVID pandemic, Miami-Dade County has had no issue attracting talent. In addition to this, there are numerous efforts of educational institutions and training agencies putting in effort to upskill local job seekers. Nevertheless, accomplishing this goal will require collaboration from large corporations, entrepreneurs, small businesses, community-based organizations, local government, and residents. Key strategies outlined in this report include expanding collaborative efforts through employer engagement, expanded partnerships between industry and education, and focusing on non-traditional students and returning citizens; aligning employability skills into levels of credential attainment, and strengthening Miami-Dade County's career pathways into target industries; and leveraging data to build a framework with clear metrics and goals and investing in innovative partnerships.



2024 Miami-Dade Education and Workforce Development Survey Sponsored by the Florida International University: Center for Community Impact and Public Purpose and the Greater Miami Chamber of Commerce, the 2024 Miami-Dade Education and Workforce Development Survey was disseminated to various employers across Miami-Dade County. The business survey focused specifically on general business challenges, retention and recruitment strategies, and the future workforce needs of Miami-Dade County businesses.

When asked about perspectives on the current workforce perhaps the largest takeaway was that 70.2% of employers believe their biggest challenge in the recruiting process is a lack of qualified candidates. Second to that, 44% of employers mentioned they have difficulty attracting top talent. When asked about candidates' expectations, managers outline competitive salaries, growth opportunities, purposeful work, company culture, and benefits packages as the top five priorities for job seekers. The next highest priority mentioned was remote work opportunities. Yet, the three categories employers found most challenging to be competitive in were competitive salaries, remote work opportunities, and growth opportunities.

Two other key components of this survey focused on the workforce pipeline and the role of colleges and universities. To bring in talent, most large employers (> \$40 million) have leaned on internship programs. Smaller employers (< \$1 million) are less likely to have hired interns; however, 57.1% mentioned they were open to it. As it pertains to hiring recent college graduates 50% stated that less than 25% of their workers are college graduates, 13.8% said greater than 50% of their workers are college graduates, 13.4% of employers said they do not hire recent graduates, 11.6% said 26-50% of their workers are college graduates, and the remaining 11.3% did not know the ratio breakdown.



Miami Tech Works

Environmental Scan

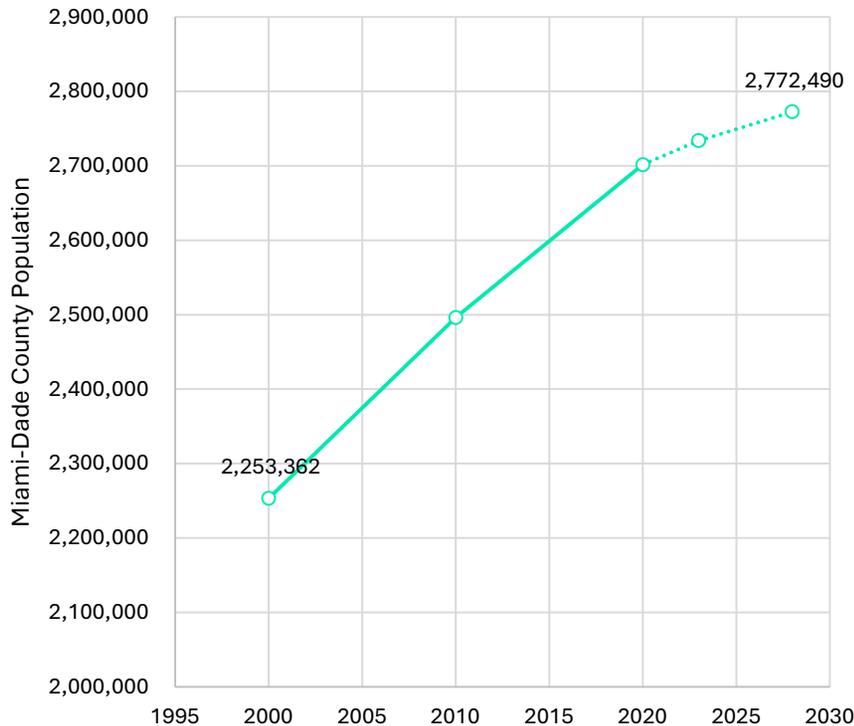
Environmental Scan

Labor Market Information

Population Trend

The population in Miami-Dade County has grown substantially over the last two decades. Between 2000 and 2020, the population increased by approximately 448,000, or nearly 20%. While the growth rate is expected to slow between 2023 and 2028, projections still estimate population growth of more than 70,000 people over the next 5 years. By 2028, the population is expected to surpass 2.77 million.

FIGURE 1: POPULATION TREND.



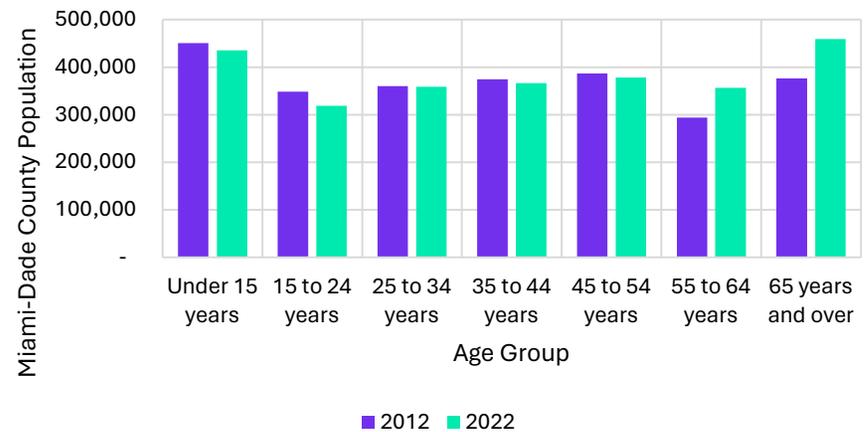
Source: US Census and Esri, 2024

Age Distribution

In Figure 2, the age distribution of the Miami-Dade County's population is provided. Like much of the country, Miami-Dade County has experienced some noteworthy changes in the makeup of their population in recent years. Most notably, the percentage of the population over the age of 55 years has increased significantly. Between 2017 and 2022, the number of individuals aged 55 years or older increased by more than 145,000. An aging population can impact various areas of the economy, such as the local workforce, housing market, and healthcare infrastructure.

While the older population grew in Miami-Dade County, every other age group saw a decline in population size between 2017 and 2022. Given that the local economy depends largely upon a diverse, employable workforce, it is imperative to understand how younger populations can be retained in and attracted to the county.

FIGURE 2: AGE DISTRIBUTION.

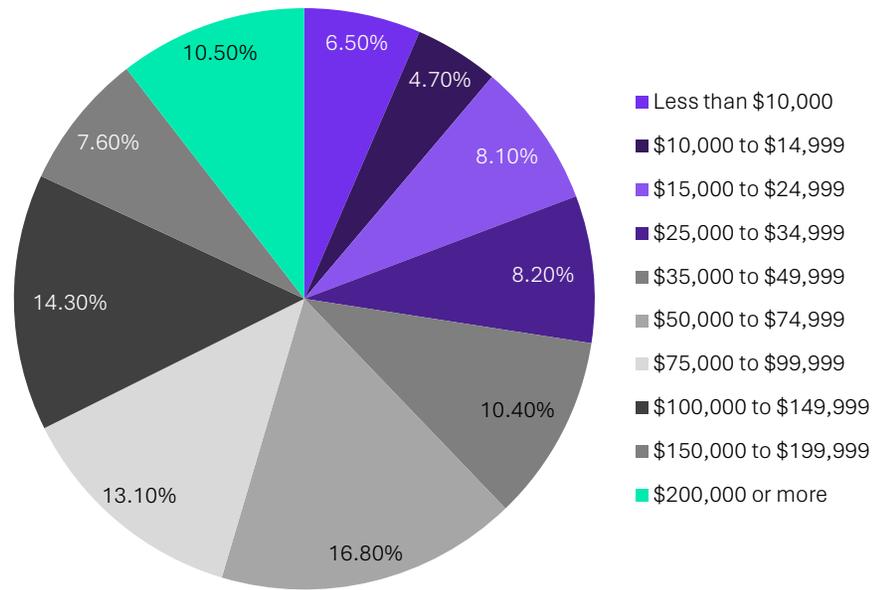


Source: ACS 1-Year Estimates

Households by Annual Income

In Miami-Dade County, households at every income level comprise a significant part of the population. About 25% of households earn less than \$25,000 per year. Roughly one third of households in the county earn more than \$100,000 per year. The median household income in 2022 was \$67,263.

FIGURE 3: HOUSEHOLDS BY ANNUAL INCOME.

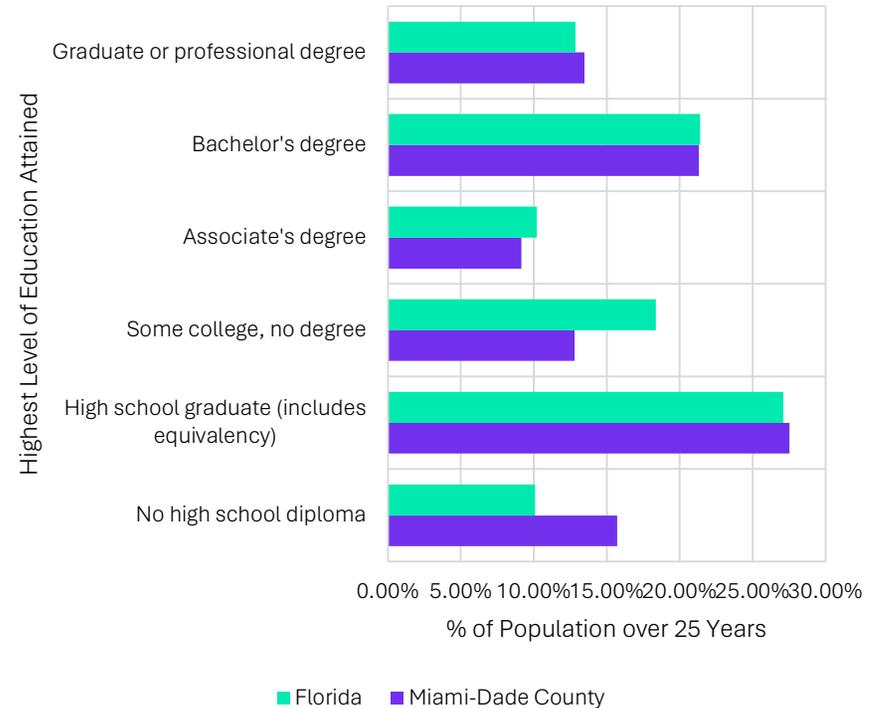


Source: ACS 2022 1-Year Estimates

Educational Attainment

The level of educational attainment in Miami-Dade County is comparable to that of the State of Florida. If anything, the educational backgrounds of county residents are more varied than is observed in the state's population. While a slightly larger share of county residents have earned a graduate or professional degree, the percentage of the population without any high school diploma is larger, as well. About 34.8% of the population holds a bachelor's degree or higher; around 84% holds a high school diploma or equivalent certificate.

FIGURE 4: EDUCATIONAL ATTAINMENT.

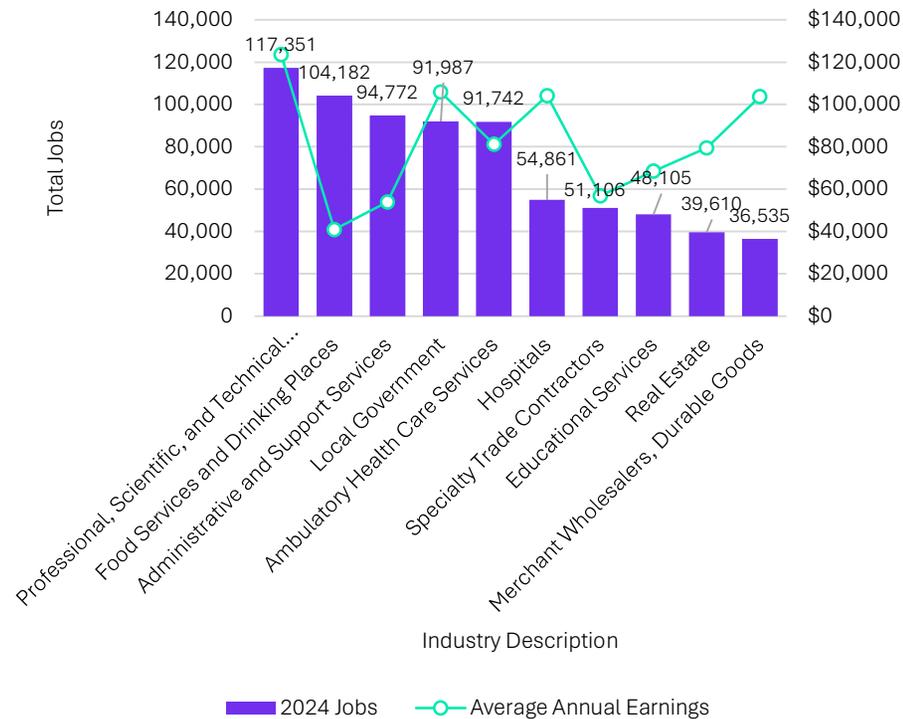


Source: ACS 2022 1-Year Estimates

Top Industries

In Figure 5, the top industries in Miami-Dade County are measured by the total number of jobs. The Professional, Scientific, and Technical Services industry is the largest, employing more than 117,000 workers in the county. Food Services and Drinking Places, Administrative and Support Services, Local Government, and Ambulatory Health Care Services are the next largest industries in the county, all employing more than 90,000 workers. Interestingly, the largest industry in the county also provides the highest annual earnings, equal to approximately \$123,500 in 2024.

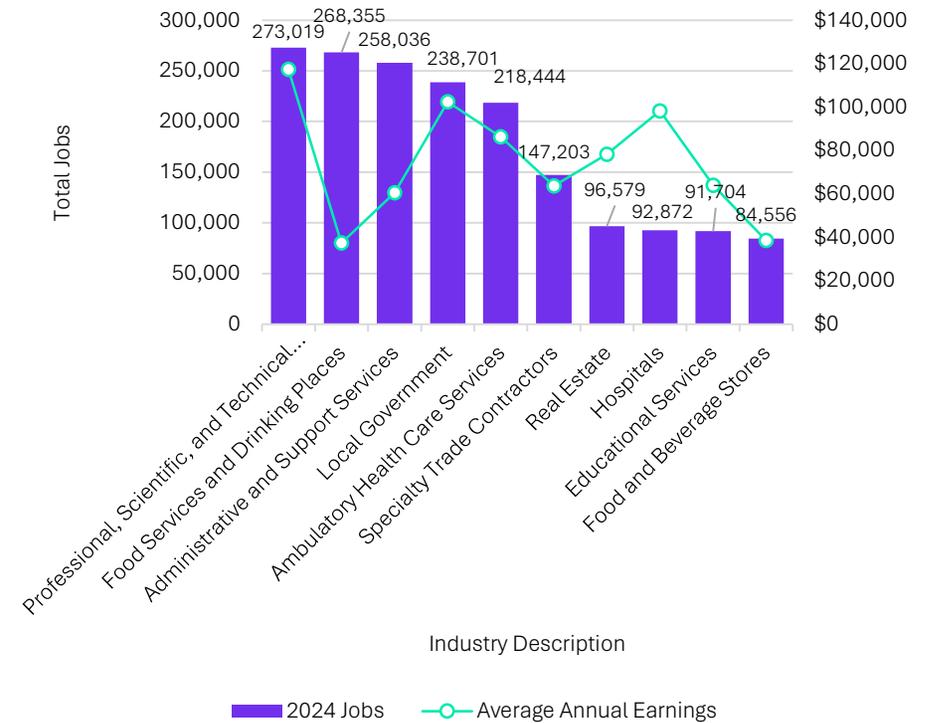
FIGURE 5: TOP INDUSTRIES BY EMPLOYMENT IN MIAMI-DADE COUNTY.



Source: Lightcast, 2024

The industry makeup of the broader region is similar to that of Miami-Dade County. For the purposes of this report, the region is defined as including Miami-Dade County, Broward County, Collier County, Monroe County, and Palm Beach County. The largest industry in the region – Professional, Scientific, and Technical Services – employs approximately 273,000 workers. As is the case in Miami-Dade County, this industry provides the highest average annual earnings in the region, equal to approximately \$117,000 in 2024.

FIGURE 6: TOP INDUSTRIES BY EMPLOYMENT IN REGION.

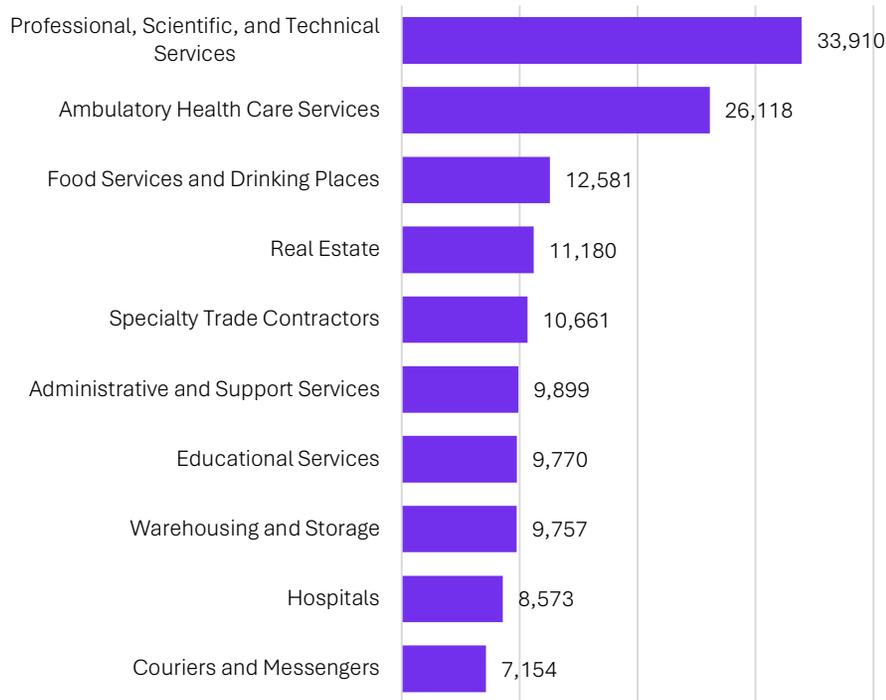


Source: Lightcast, 2024

Fastest-Growing Industries

In Miami-Dade County, several industries are projected to realize substantial growth over the next ten years. In fact, the largest industries in the county are also those which are expected to add the greatest number of jobs. Between 2024 and 2034, the Professional, Scientific, and Technical Services industry is expected to add nearly 34,000 jobs in the county. A variety of healthcare, hospitality, and service-related industries are projected to grow by tens of thousands of jobs over the same period.

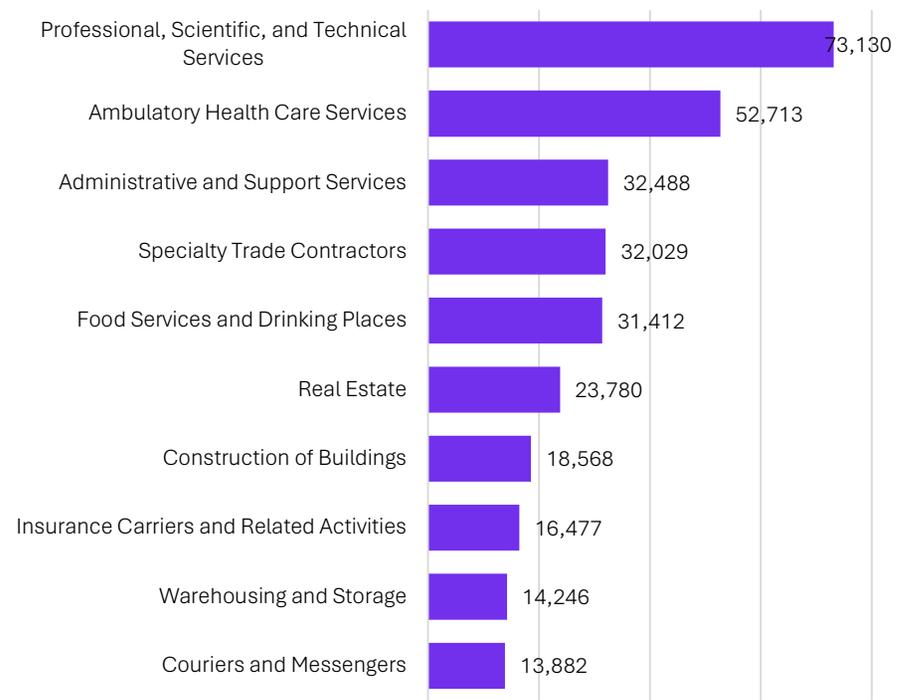
FIGURE 7: FASTEST-GROWING INDUSTRIES BY EMPLOYMENT IN MIAMI-DADE COUNTY.



Source: Lightcast, 2024

Regionally, similar industry growth trends are projected. Beyond Miami-Dade County, an additional 40,000 jobs are expected to be created within the Professional, Scientific, and Technical Services industry. The Ambulatory Health Care Services industry and the Administrative Support Services industry are the next fastest-growing industries, projected to add a combined 85,000 jobs over the next ten years.

FIGURE 8: FASTEST GROWING INDUSTRIES BY EMPLOYMENT IN REGION.

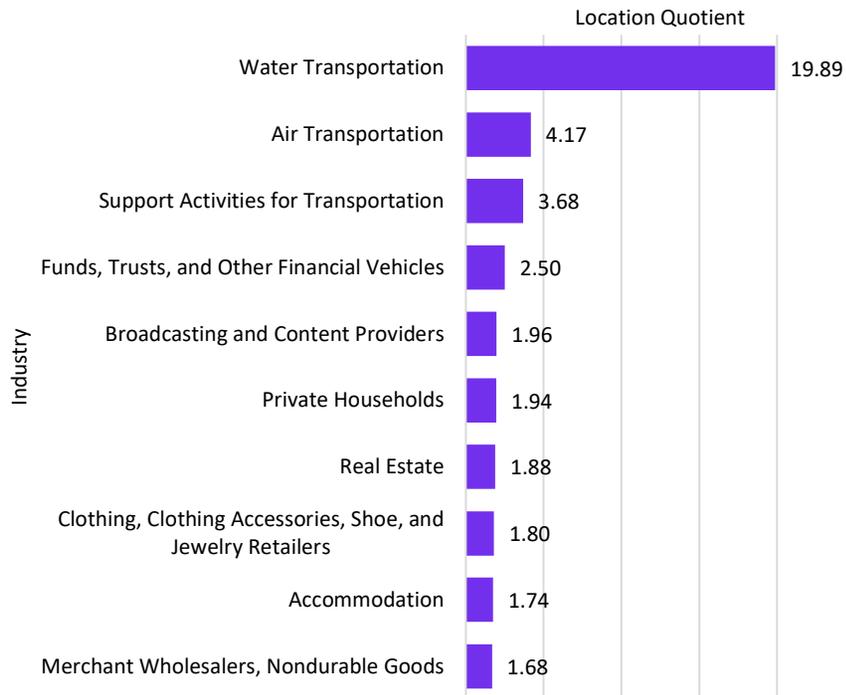


Source: Lightcast, 2024

Industry Concentration

Location quotient (LQ) is a metric used to compare the concentration of industries within a region to the national average. Any LQ greater than 1 indicates that the industry is more highly concentrated in Miami-Dade County than in otherwise similar counties across the country. Highly concentrated industries typically indicate a competitive advantage of the region for that particular industry, which could imply further opportunity for growth. In addition, industries with high location quotients are often significant exporting industries. Their retention and growth within the county are important for attracting revenue into the county from beyond its borders. In Figure X, the top ten most highly concentrated industries in Miami-Dade County are listed.

FIGURE 9: INDUSTRY CONCENTRATION.



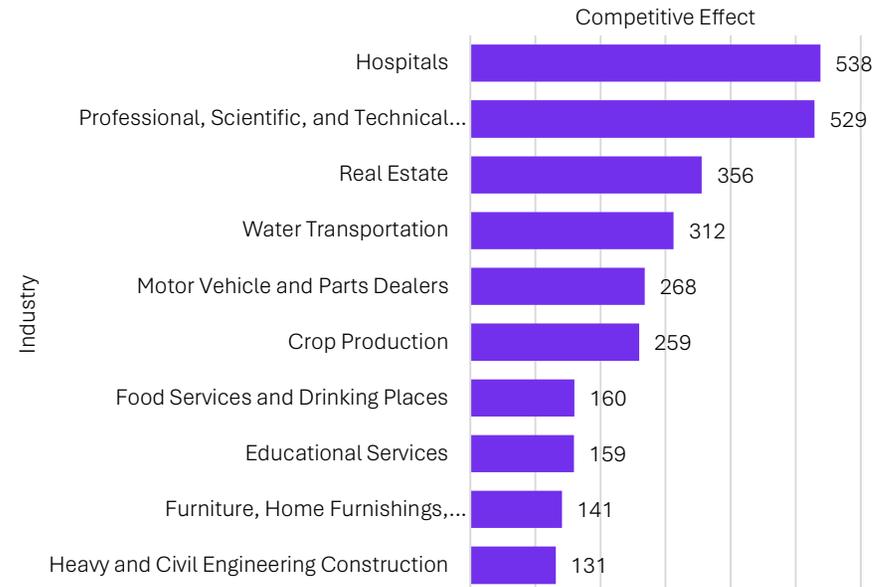
Source: Lightcast, 2024

Shift Share Analysis

A shift share analysis is used to gauge the competitiveness of specific industries within a defined region. In other words, this analysis measures how much of the job change for a given industry within the region is the result of some unique competitive advantage. To calculate the competitive effect, actual job growth in the last year (2023-2024) is compared to expected job growth within the same period. Expected job growth is estimated using industry mix effect, which is the number of jobs expected to be added (or lost) within the industry in the defined region, as well as the national growth effect, which is the number of jobs an industry is expected to gain or lose according to national economy trends. The competitive effect, then, measures the difference between the expected job change and the actual job change in the county.

In Miami-Dade County, the most competitive industries are the “Hospitals” and “Professional, Scientific, and Technical Services” industries, which added 538 and 529 more jobs (respectively) than expected from 2023-2024. Each of these industries can be expected to realize additional growth in the future, because the county itself offers some competitive advantage to businesses in the industries.

FIGURE 10: COMPETITIVE EFFECT.

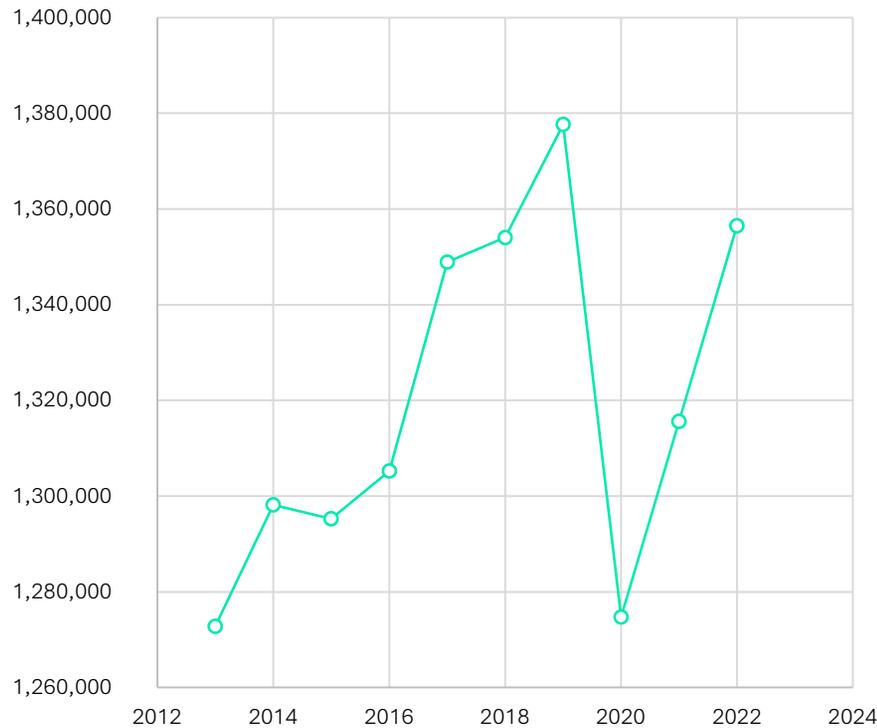


Source: Lightcast, 2024

Labor Force

Between 2013 and 2022, the labor force in Miami-Dade County has grown by approximately 84,000 workers. Labor force levels increased steadily between 2013 and 2020; then, during the COVID-19 pandemic, labor force levels fell sharply. Since 2020, the labor force has recovered and is approaching pre-pandemic levels. In 2022, the labor force in Miami-Dade County totaled about 1.35 million workers.

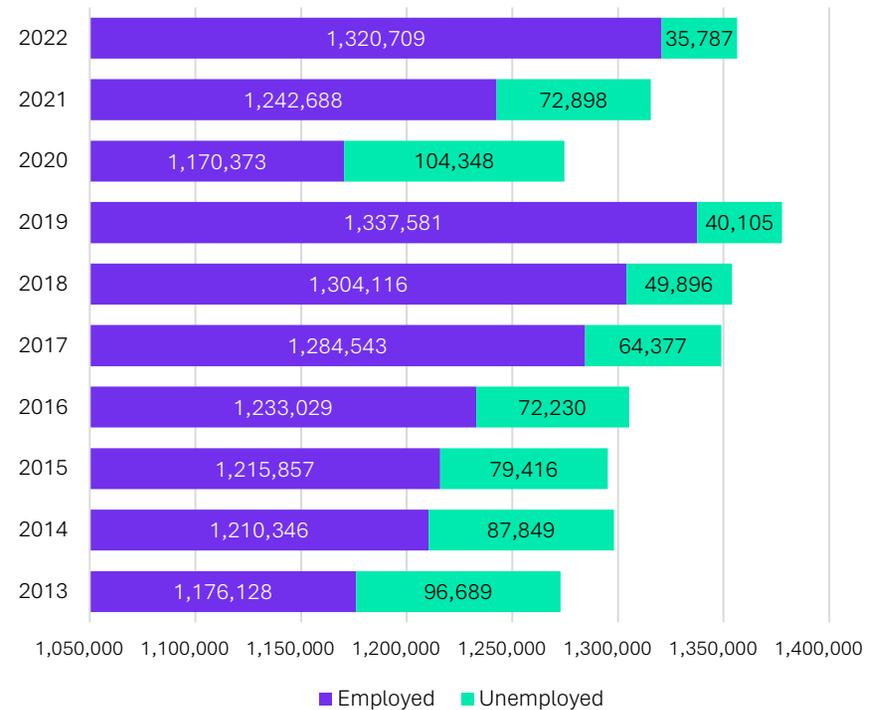
FIGURE 11: MIAMI-DADE COUNTY LABOR FORCE.



Source: BLS, 2024

Employment levels have increased in the county over the same period. As was observed in the labor force trend, employment levels fell during the COVID-19 pandemic. In 2020, the share of unemployed workers in the overall labor force increased significantly. In the years following, however, employment returned to levels comparable to the previous decade, and unemployment levels fell, too. In 2022, there were approximately 1.32 million workers employed in Miami-Dade County; about 36,000 workers were unemployed.

FIGURE 12: HISTORICAL EMPLOYMENT IN MIAMI-DADE COUNTY.

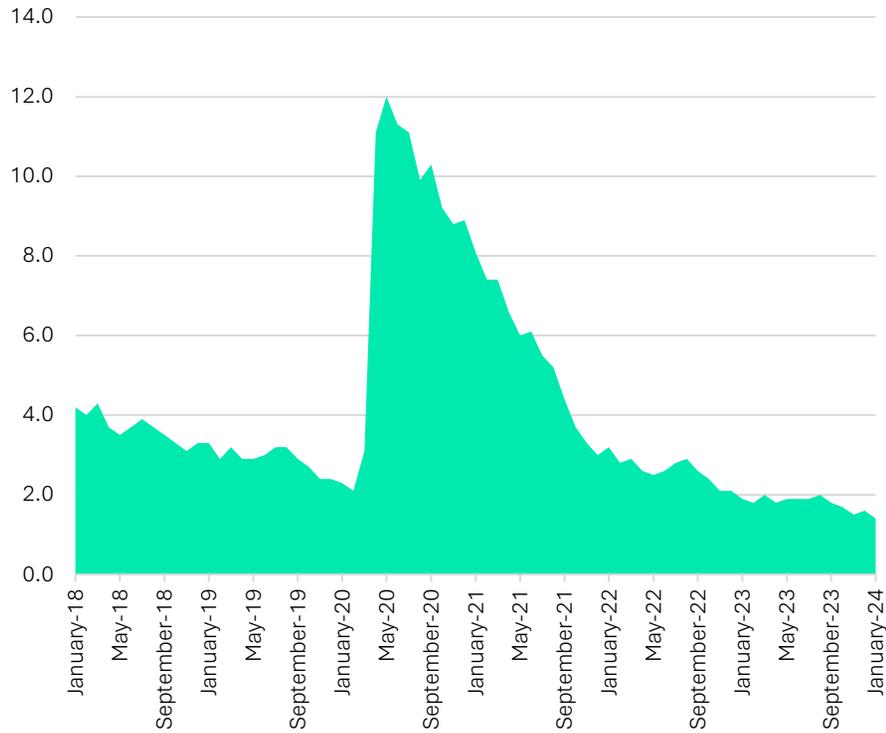


Source: BLS, 2024

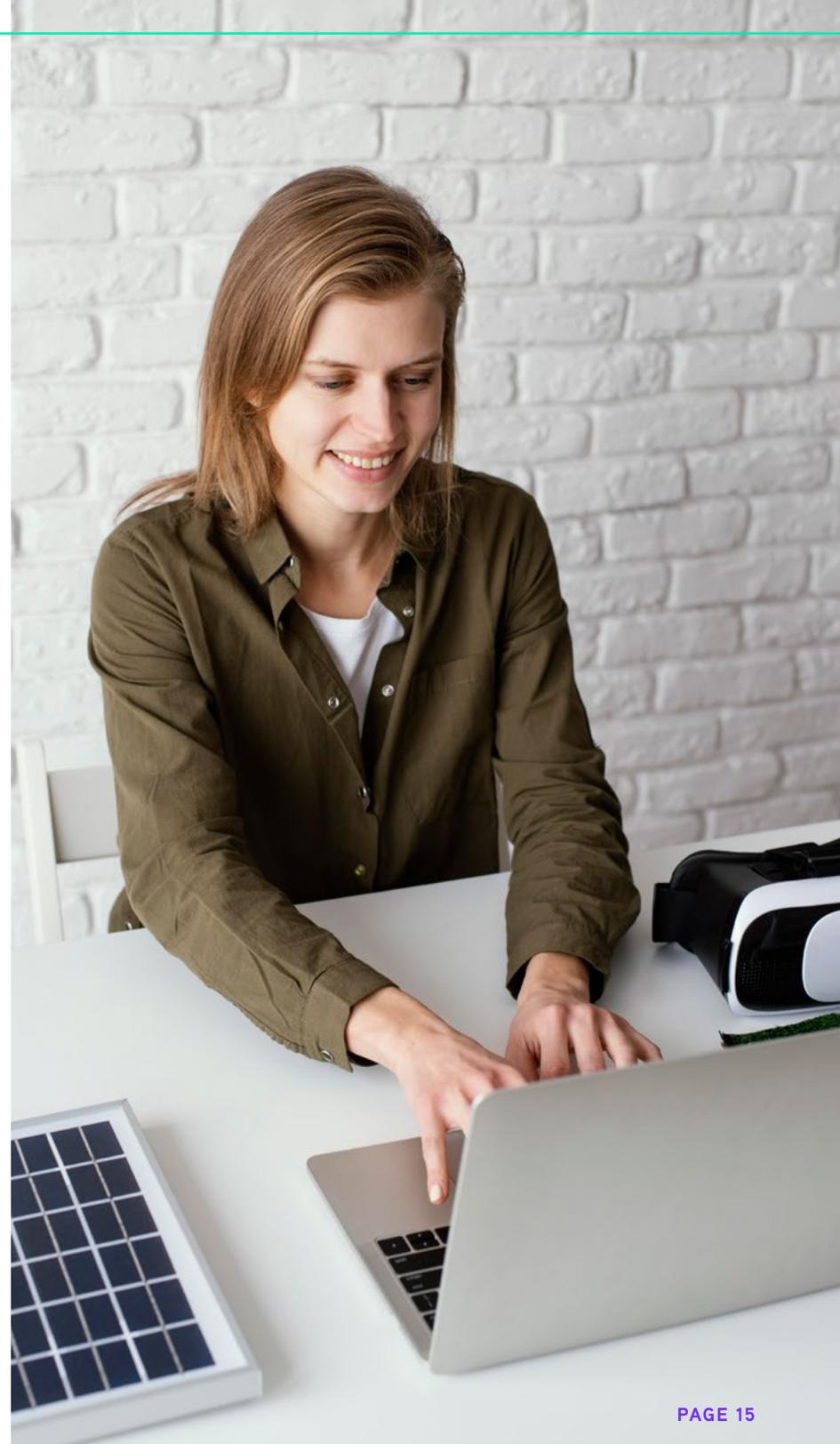
Unemployment Rates

Figure 10 presents the unemployment rate in Miami-Dade County over the last five years. Between January 2018 and April 2020, the unemployment rate in the county trended gradually downward. Unemployment spiked in response to COVID-19, but by the third quarter of 2021, the unemployment rate had fallen to pre-pandemic levels. As of January of 2024, the unemployment rate in the county was the lowest it had been in 5 years, reaching 1.4%.

FIGURE 13: HISTORICAL UNEMPLOYMENT RATE IN MIAMI-DADE COUNTY.



Source: BLS, 2024



Analysis of Target Sectors, Industries and Occupations

Defining the Tech Sector

With the help of Miami Tech Works, the project team identified 16 occupations which can be considered part of the “Tech Sector.” In order to measure job growth and identify any skills gaps, it is important to clearly define the parameters of the target sector. In Table 1, the identified occupations, as well as the total number of workers who hold the occupation in 2024, are provided. These occupations provide various incomes and are accessible to many types of workers; some are accessible to recent graduates with little professional experience, and others are higher-earning, senior roles. All data collected in this section are representative of the five-county region defined previously in the report, which includes Broward, Collier, Miami-Dade, Monroe, and Palm Beach Counties.

TABLE 1: OCCUPATIONS IN THE TECH SECTOR & TOTAL JOBS IN 2024.

| SOC | Description | 2024 Jobs |
|---------|--|------------------|
| 15-1250 | Software and Web Developers, Programmers, and Testers | 31,872 |
| 15-1230 | Computer Support Specialists | 16,764 |
| 15-1210 | Computer and Information Analysts | 10,480 |
| 15-1240 | Database and Network Administrators and Architects | 10,223 |
| 11-3021 | Computer and Information Systems Managers | 7,669 |
| 15-1290 | Miscellaneous Computer Occupations | 4,911 |
| 43-9020 | Data Entry and Information Processing Workers | 4,579 |
| 17-3020 | Engineering Technologists and Technicians, Except Drafters | 4,409 |
| 17-3010 | Drafters | 3,654 |
| 15-2050 | Data Scientists | 3,158 |
| 49-2010 | Computer, Automated Teller, and Office Machine Repairers | 2,164 |
| 11-9040 | Architectural and Engineering Managers | 2,159 |
| 29-9020 | Health Information Technologists and Medical Registrars | 1,112 |
| 11-2022 | Sales Managers | 832 ² |
| 15-1220 | Computer and Information Research Scientists | 680 |
| 17-2060 | Computer Hardware Engineers | 286 |

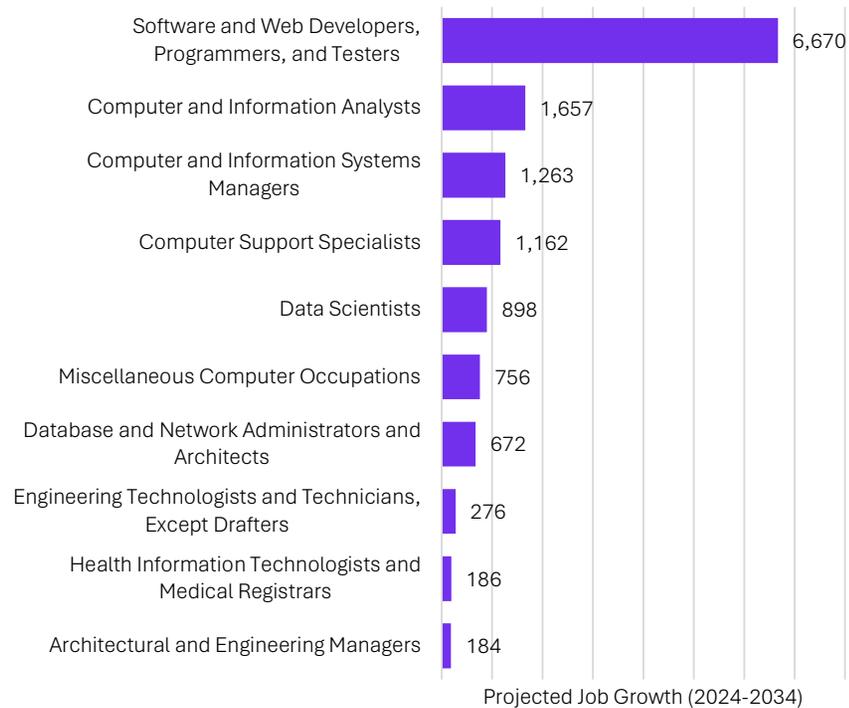
Source: Lightcast, 2024

2 This amount represents 7.8% of all sales manager jobs in the region.

Fastest-Growing Tech Occupations

Regionally, the “Software and Web Developers, Programmers, and Testers” occupation is the fastest growing. Between 2024 and 2034, an additional 6,670 workers are projected to hold the occupation. Computer and Information Analysts and Systems Managers are the next fastest growing occupations and are collectively expected to grow by nearly 3,000 workers by 2024.

FIGURE 14: FASTEST-GROWING TECH OCCUPATIONS BY EMPLOYMENT.

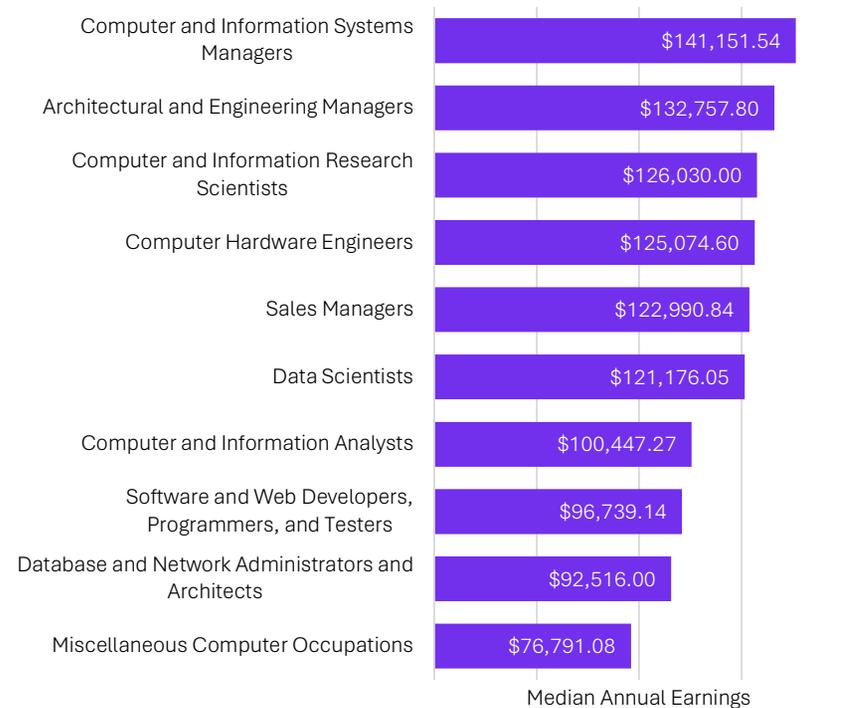


Source: Lightcast, 2024

Highest-Earning Tech Occupations

The highest-earning tech occupations in the region are both manager-level occupations: “Computer and Information Systems Managers,” and “Architectural and Engineering Managers.” The average annual earnings for these occupations are both above \$130,000. Research scientists, hardware engineers, and analysts are also among the highest-earning occupations in the sector. Seven occupations in the Tech Sector earn average annual incomes of greater than \$100,000.

FIGURE 15: HIGHEST EARNING TECH OCCUPATIONS.³



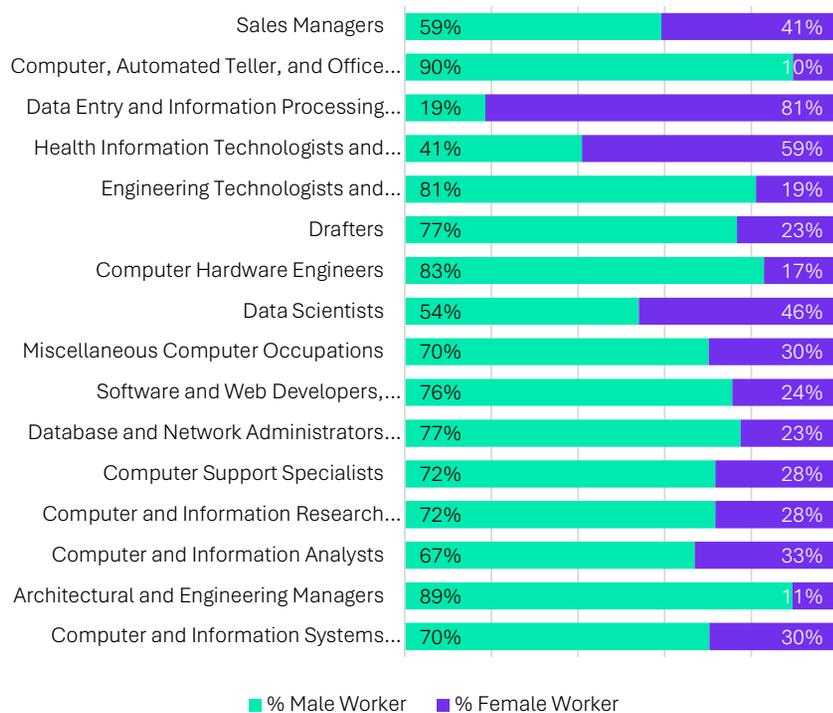
Source: Lightcast, 2024

³ The data for the Sales Manager occupation in Figures 12, 13, and 14 are representative of workers in all industries (not only the Tech industry).

Gender & Diversity

In Figure 16, the gender distributions for each occupation in the Tech Sector are presented. In most cases, males make up a larger share of the workforce than females. The exceptions are the “Data Entry and Information Processing Workers” and “Health Information Technologists and Medical Registrars” occupations, which are both comprised mostly of female workers.

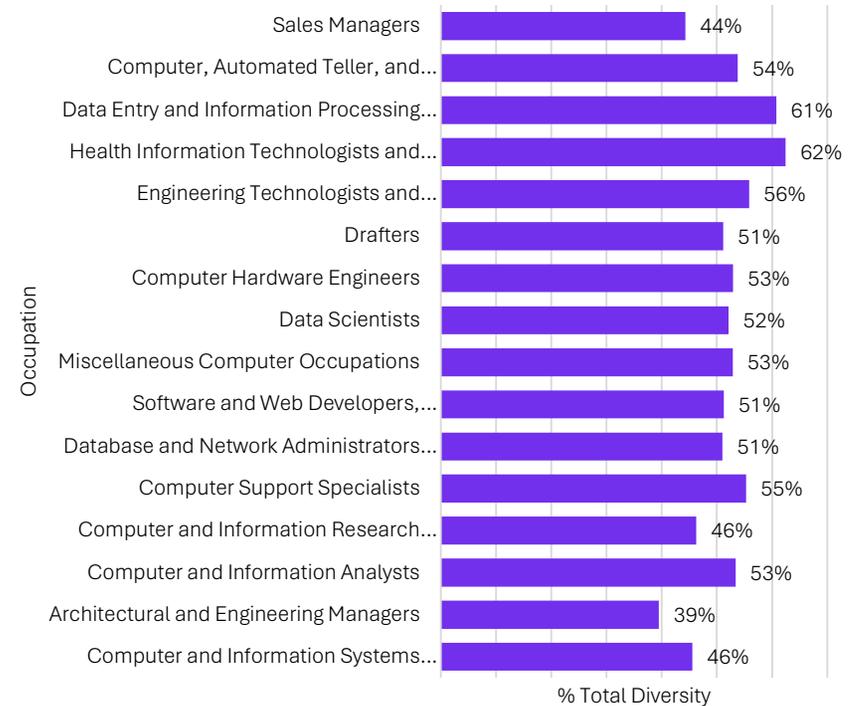
FIGURE 16: GENDER DISTRIBUTION IN TECH OCCUPATIONS.



Source: Lightcast, 2024

In Figure 14, the racial and ethnic diversity of each occupation in the Tech Sector is presented. This graph illustrates Total Diversity, which measures the percent of the workforce in each occupation which is: Hispanic or Latino; Black or African American; Asian; American Indian or Alaska Native; Native Hawaiian or other Pacific Islander; or two or more races. The share of diverse workers in the Tech Sector varies by occupation. In some cases, the population of diverse workers comprises a majority of the occupation’s workforce; in others, the diverse workforce is the minority.

FIGURE 17: RACIAL AND ETHNIC DIVERSITY IN TECH OCCUPATIONS.

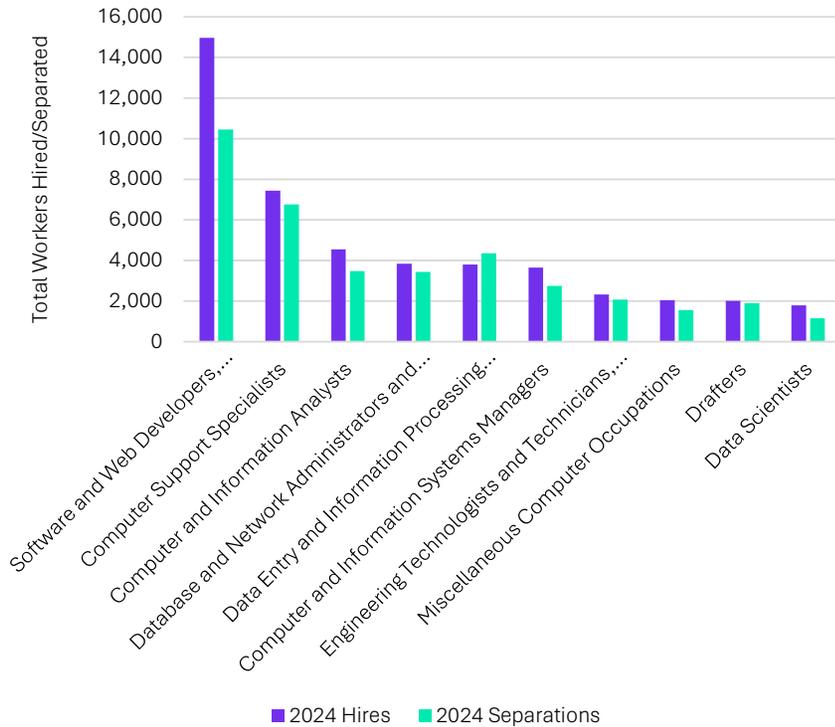


Source: Lightcast, 2024

Hires & Separations

In Figure 15, occupations in the Tech Sector are ranked by the total number of hires expected in 2024. In addition to the hiring data, the estimated number of separations are provided for each occupation. Of the top ten occupations projected to make the most hires in 2024, nine are expected to hire more workers than are expected to separate. The “Software and Web Developers, Programmers, and Testers” occupation, which is also the fastest-growing occupation in the region, is projected to hire nearly 15,000 workers over the course of 2024.

FIGURE 18: HIRES VS. SEPARATIONS.

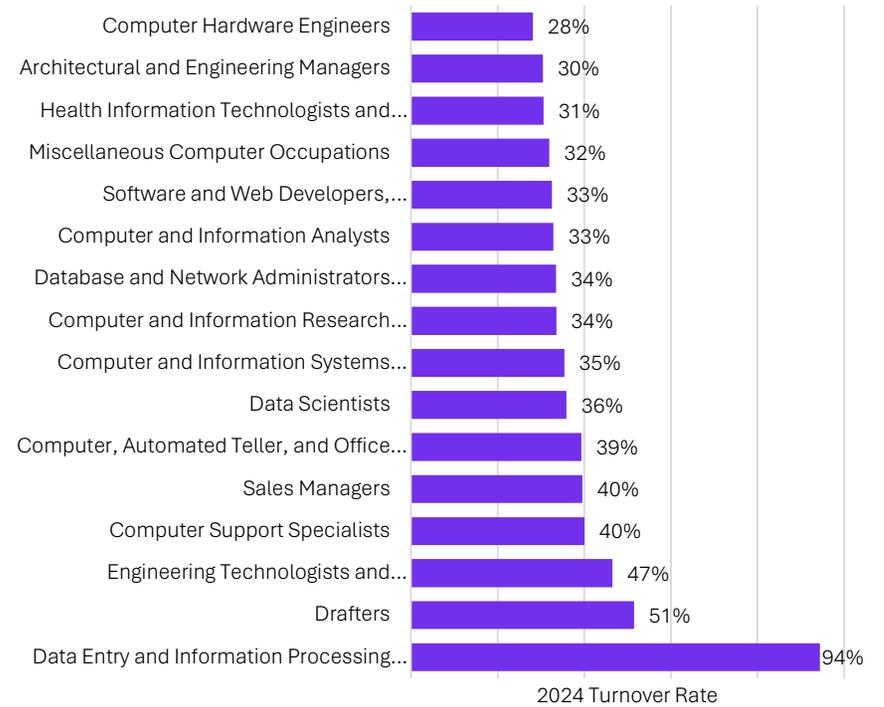


Source: Lightcast, 2024

Turnover Rate

The turnover rate in an occupation is calculated by comparing the estimated number of separations to the total number of jobs. As separations increase relative to total jobs, the turnover rate increases, too. This metric can be useful for understanding how fluidly workers move between different employers, even in the same occupation. The occupations with the lowest turnover rates (such as “Computer Hardware Engineers” or “Architectural and Engineering Managers”) are also some of the highest-earning occupations. Those occupations with the highest turnover rates are typically earning lower wages, which can motivate more frequent movement between places of employment.

FIGURE 19: TURNOVER RATE.

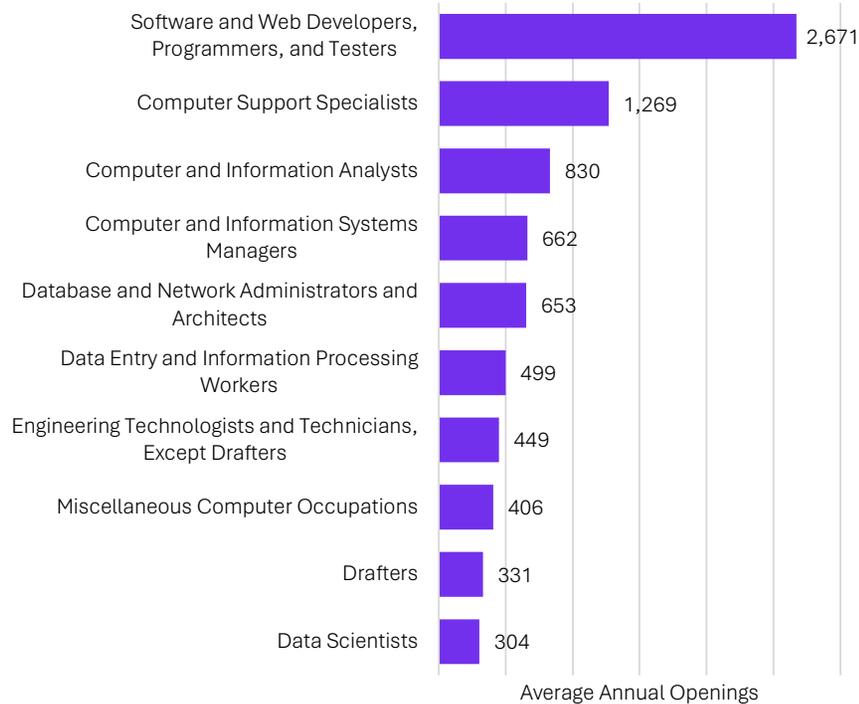


Source: Lightcast, 2024

Annual Openings

Another useful metric for measuring job demand in any given occupation is the average annual job openings. In 2024, the “Software and Web Developers, Programmers, and Testers” occupation is expected to offer around 2,700 job openings, which is the highest of all occupations in the Tech Sector. “Computer Support Specialists,” “Computer and Information Analysts,” and “Computer and Information Systems Managers” are the occupations with the next highest estimates for job openings in 2024.

FIGURE 20: ANNUAL OPENINGS.



Source: Lightcast, 2024





Miami Tech Works

Gap Analysis

Gap Analysis

Building on the high-level industry, education, and retention trends examined in detail above, this section applies these disparate data sources to construct a series of supply gap analyses. In brief, these supply gaps compare the number of retained graduates who can be funneled into tech jobs within the region with the projected needs generated by growth, replacements, and retirements within these occupations. When the number of retained graduates falls short of the projected employment needs within a given year, a supply gap between the available talent and open positions exists. Conversely, if there are more retained graduates than required for projected job openings, then a talent surplus exists.

To get to this rather straightforward comparison between graduates and job openings, several steps are necessary to clean, refine, and combine data available from multiple sources:

- 1 The *Occupational Employment and Wage Statistics* program from the US Bureau of Labor Statistics to provide the needed data on **current employment**, projected **future employment**, and **wages** for occupations identified by the team as STEM-related.^{4,5}
- 2 The Classification of Instructional Programs/Standard Occupational Classification (CIP/SOC) Crosswalk from the National Center for Education Statistics and the Bureau of Labor Statistics to identify **CIPs** (or majors/ courses of study) that lead to employment in the occupations identified as STEM-related.⁶
- 3 The Integrated Postsecondary Education Data System (IPEDS) from the National Center for Education Statistics to provide **graduate counts, by CIP and degree-level**, for all regional institutions for academic year 2021/2022 (the latest available data).⁷

- 4 The Post-Secondary Employment Outcomes program, part of the Longitudinal Household Employment Dynamics series from the US Census Bureau to estimate **retention rates by CIP and degree level** of postsecondary graduates. Unfortunately, Florida is not a participating state in this voluntary program, so to estimate likely rates we combined and averaged the rates available for the neighboring state of Georgia and the coastal state of South Carolina. All have seen similar population growth trends since the onset of COVID-19 and are, obviously, all part of the southeastern region of the United States.

These component pieces are combined in an intentional, methodical process to produce defensible estimates of immediate and long-term trends in the gap between tech grads retained in the state and the future employment opportunities projected for the counties of **Palm Beach, Broward, Collier, Monroe, and Miami-Dade**. The flow charts below provide an overview of this process, broken down by the steps included in DEMAND, SUPPLY, and GAP calculations. Further details follow the diagrams, with the component data included as appendices.

4 Occupational Employment and Wage Statistics: <https://www.bls.gov/oes/>

5 Modeled by LightCast™, as informed by the BLS-funded Projections Management Partnership consortium of state LMI shops.

6 CIP-SOC Crosswalk: <https://nces.ed.gov/ipeds/cipcode/post3.aspx?y=56>

7 Integrated Postsecondary Education Data System: <https://nces.ed.gov/ipeds/>

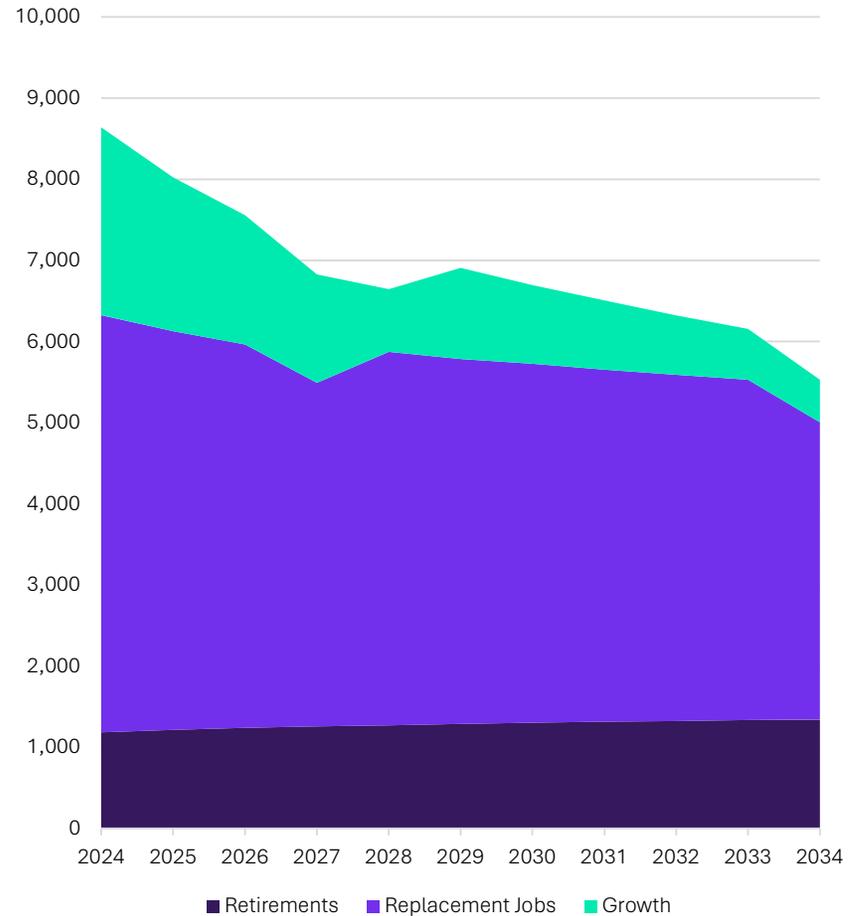
FIGURE 21: DEMAND CALCULATION PROCESS



Following this process, we estimate that for the identified occupations, there will be **75,806 openings** that will need to be filled over the next decade.

Figure II below graphs these openings, by type and year, for the entire collection of identified Tech occupations.

FIGURE 22: PROJECTED OPENINGS BY YEAR AND TYPE,



All Identified Tech Occupations, 2024-2033

Detailed Methodological Notes: Demand Calculation

1 Relying on researcher knowledge and markers in the LightCast™ data platform, the team compiled a list of all occupations that they considered reliant on tech graduates. This list was then shared with representatives from Miami Tech Works.

2 Following careful review by and detailed discussion with MD officials, the decision was made to retain 26 Occupations (6-digit SOCs), ultimately grouped into 14 unique occupation families (5-digit SOCs) for gap analysis. These occupations, as well as information on typical entry-level education and earnings, appear in full in the appendix.

3 Armed with current and projected employment counts for these 26 occupations, we next isolate the number of jobs that will need to be filled annually, disaggregated by growth (newly created future jobs), retirement (jobs that will need to be filled because of retirement), and replacement (positions that will be vacated by workers leaving the occupation and not taking a similar position in the region). The color codes below mirror how these numbers are graphed in the gap analyses, with **GREEN = GROWTH**, **BLUE = REPLACEMENT**, and **YELLOW = RETIREMENT**

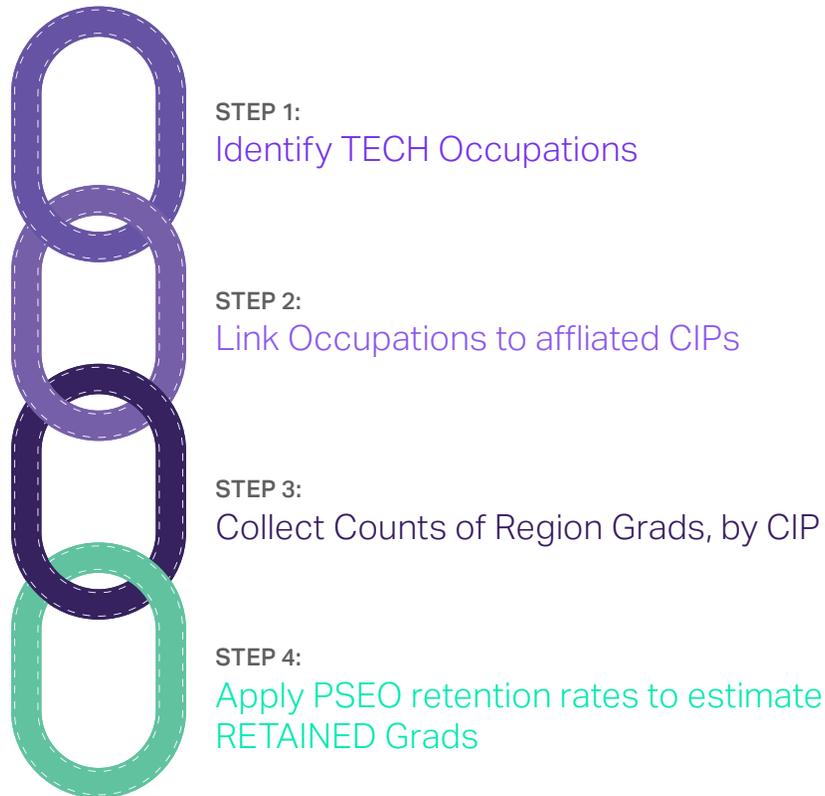
GROWTH: Using annual projections of employment through 2034, we estimate the number of growth jobs created by subtracting the previous year's projected employment from the current year projected employment.

RETIREMENT: Using BLS estimates on age of the workforce, we utilize the percent of the current occupations held by individuals aged 55 or older, then divide this total by 11 to yield an annual expected replacement rate. This rate, when multiplied by total annual employment, estimates the number of retirement jobs that will need to be filled.

REPLACEMENT: Utilizing the projected annual openings data from LightCast™, which does not disaggregate by reason for the openings, we subtract our projected retirements and projected growth jobs from the total projected openings and assume that all remaining openings occur because the prior incumbent left the workforce entirely, left the occupation, or left the region.

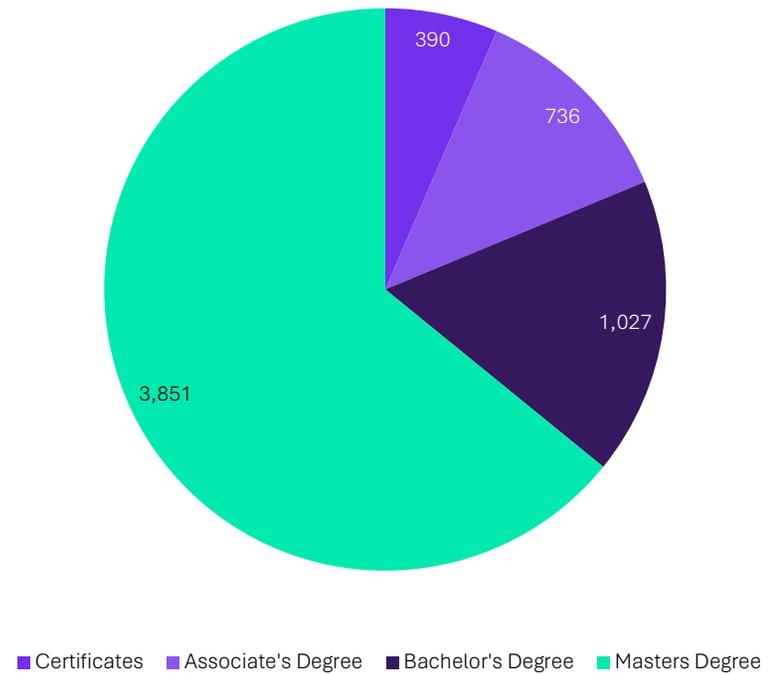
Reviewing the entire universe of future growth projections provided by LightCast™, we see a consistent drop in projected growth across the years 2027-2029, most often in the year 2028. This drop in projected growth is uniform across all industries and most jobs, which indicates that it is not driven by a seismic shift in growth but rather by the modeling itself. As the confidence in growth diminishes the further we reach into the future, the error bands grow and, ultimately, the number of anticipated new jobs that projections experts are willing to attest to shrinks exponentially. Rather than discard 10-year projections in our gap analyses, we acknowledge the existence of this cliff in and around 2028 and provide 5-year graphs as well. Ongoing monitoring of updated projections in response to future economic conditions will be an important part of addressing any potential gaps.

FIGURE 23: SUPPLY CALCULATION PROCESS



Turning now to the calculation of supply of future grads, using the process laid out in Figure III above, we were able to isolate **11,996 graduates** in the 2021/22 academic year with the required training to fill one of these occupations. Based on retention data from PSEO (that is, the percentage of these grads who remain in the region to work after graduation), we adjust this number down to **6,003 retained graduates**. If graduation and retention rates remain constant, we estimate that between 2024 and 2034 there will be **66,033 retained grads** to fill the **75,806 tech openings** identified in the demand process. All told, this represents a **deficit of 9,773 workers** over the next decade. Figure IV below charts the retained graduates, by degree level, annually (based on 2021/22 graduation rates).

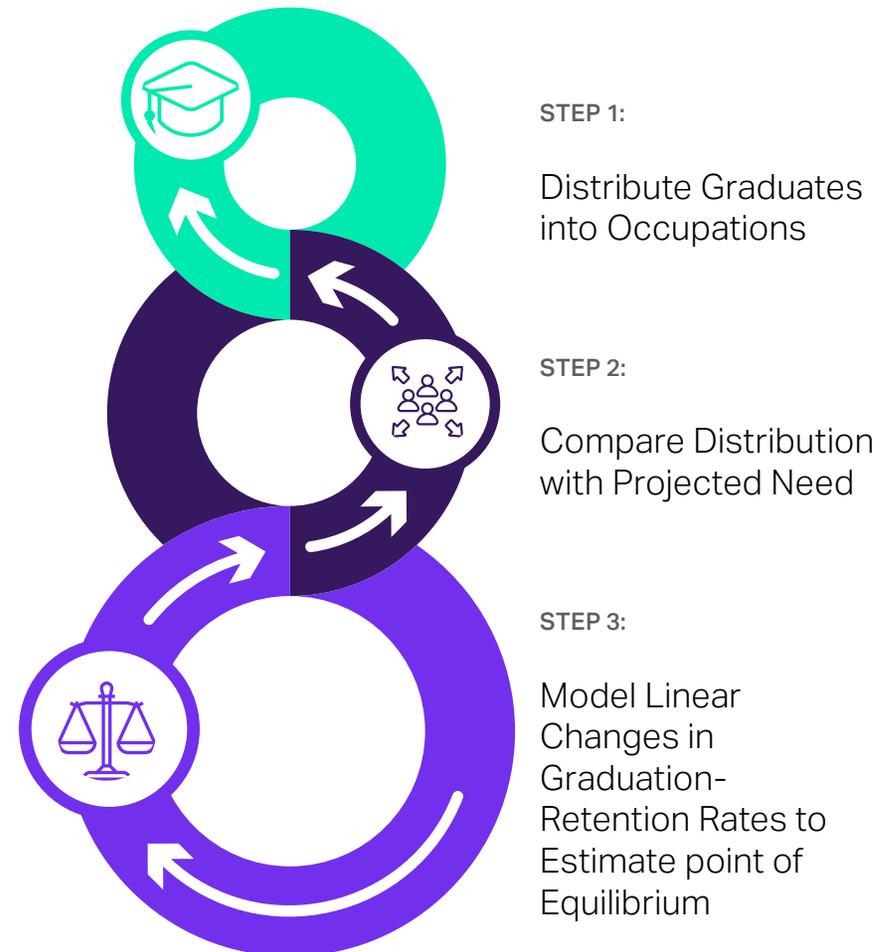
FIGURE 24: ANNUAL COUNT OF RETAINED GRADUATES, BY DEGREE LEVEL



Detailed Methodological Notes: Supply Calculation

- 1** Define Occupations, using the process described as part of the Demand Calculation, in concert with the team from Miami Tech Works.
- 2** Identify Training Programs (curricula or majors, known as CIPs) affiliated with each occupation, via the CIP/SOC crosswalk. The Crosswalk, a product of the US BLS and the National Center for Education Statistics, identifies the training and curricula that are affiliated/required for entry into any given occupation. Using the data they report, we populated a full list of CIPs that are linked to the occupations under review.
- 3** Using this list of trainings (CIPs), we next accessed the IPEDs program data files from NCES to download counts of all graduates from regional institutions (as reported to NCES) in the latest academic year, broken down by CIP and degree award level.
- 4** Finally, using this list of graduates by CIP, we downloaded cohort data from the Post-Secondary Employment Outcome (PSEO) program from Census. This data tracks cohorts of graduates, by CIP and degree level, across time and currently spans over 20 years of degree earners. The program reports count of graduates, by degree and CIP, currently employed anywhere, those employed in the state of Indiana, and those not attached to the workforce (no payroll tax records). To estimate the retention rate of Florida graduates, we utilized trends from the comparable regional states of Georgia and South Carolina, as Florida does not participate in the program. Retention rates were calculated by dividing the number of graduates employed in these states by the total count of all graduates employed PLUS the number of non-attached graduates to estimate a retention rate. Multiplying this retention rate, unique for each CIP and degree level, by the 2021/2022 count of regional graduates, provides a defensible estimate of the number of graduates the region can expect to retain as part of their workforce.

FIGURE 25: GAP CALCULATION PROCESS



Detailed Methodological Notes: Gap Calculation

1

Step 1: Graduates to Occupations- in order to make sure we are not overcounting graduates, that is, placing them into more than one full-time position, we need to distribute graduates across occupations in a way that mirrors existing employment in the region. A single CIP can be linked to multiple professions, and rather than making assumptions about which profession any given graduate will self-filter into, we apply current patterns of employment to estimate how many grads end up in each job. As an example, consider graduates with a degree in Computer Programming (CIP 11.02).

In our CIP/SOC crosswalk, we find graduates with degrees in Computer Programming working in 6 unique occupations, as identified in the table below. Rather than randomly assign each of the 222 graduates with these types of degrees into one of these 6 occupation groups, we instead opt to mirror the current distribution of their collective workforce. In 2024, there are 35,352 of these types of jobs in the region. Dividing this total into the count of employment for each of the unique occupations produces a percentage that we can use to estimate graduate distribution as well (see Table I below).

Implicit in this approach is the assumption that new graduates will distribute themselves across available occupations in a manner that mirrors the current distribution of all workers in the occupations they can choose from. From our example, and put simply, if there are twice as many “Computer Network Support Specialists” than “Computer Programmers”, then we expect that twice as many new graduates will enter the former vis-à-vis the latter.

TABLE 2: COMPUTER PROGRAMMING GRADUATES (RETAINED IN REGION), OCCUPATION DISTRIBUTIONS

| SOC | Description | Jobs, 2024 | Percent of Jobs | Retained Graduates, 2021/22 |
|--------------|---|---------------|-----------------|-----------------------------|
| 15-1231 | Computer Network Support Specialists | 3,480 | 9.84% | 22 |
| 15-1251 | Computer Programmers | 1,759 | 4.98% | 11 |
| 15-1252 | Software Developers | 21,362 | 60.43% | 134 |
| 15-1253 | Software Quality Assurance Analysts and Testers | 2,901 | 8.21% | 18 |
| 15-1254 | Web Developers | 3,132 | 8.86% | 20 |
| 15-1255 | Web and Digital Interface Designers | 2,717 | 7.69% | 17 |
| Total | | 35,352 | 100% | 222 |

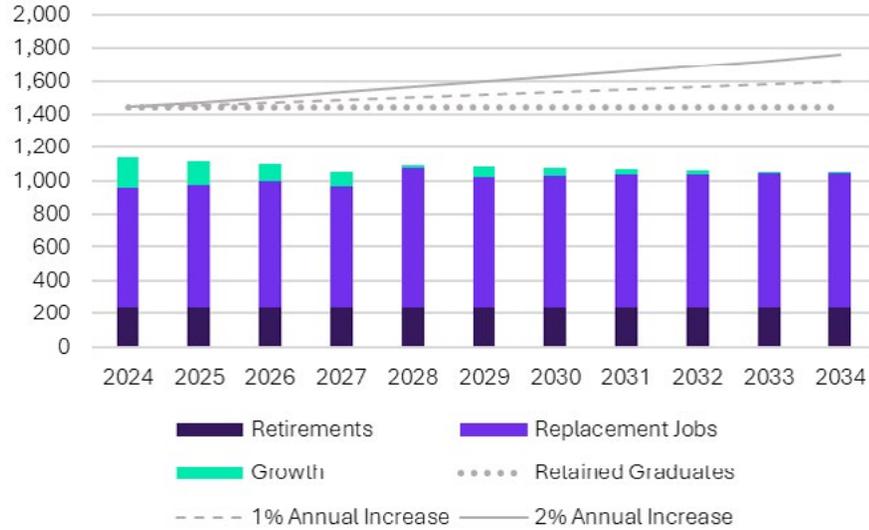
2 Compare Distribution of Graduates to Projected Future Need- after we've distributed graduates across the occupation families, the next step is to re-aggregate all graduates, from all programs, by family of occupation. By summing across all courses of study, we get a complete estimate of retained grads distributed solely by job, regardless of course of study. From there, we need only construct a table that compares annual grads to annual need and graph the numbers to provide visual interpretation of the gap. We also include simple breakout tables identifying the number of additional graduates needed annually to approach equilibrium between supply and demand, by the year 2034.

3 Model Linear Changes, Graduation/Retention Rate- finally, to highlight the impact that improvements in either the number of tech-affiliated program graduates and/or their retention in the region, we estimate simple linear increases year-over-year. The scale of these needed changes varies from one occupation family to another, so careful attention should be paid to the rates applied in each estimation.

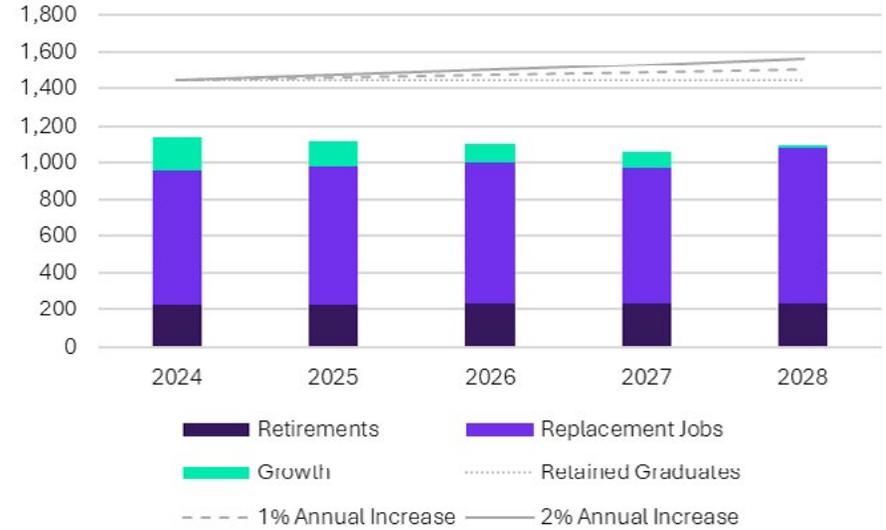
Combining these processes for demand, supply, and gap, what emerges is a complete picture of the future of tech employment in the state of Indiana. On the following pages, we dig into the details for each of the 14 identified occupation families.



SOC 11-2022: SALES MANAGERS, 10-YEAR ESTIMATES



SOC 11-2022: SALES MANAGERS, 5-YEAR ESTIMATES



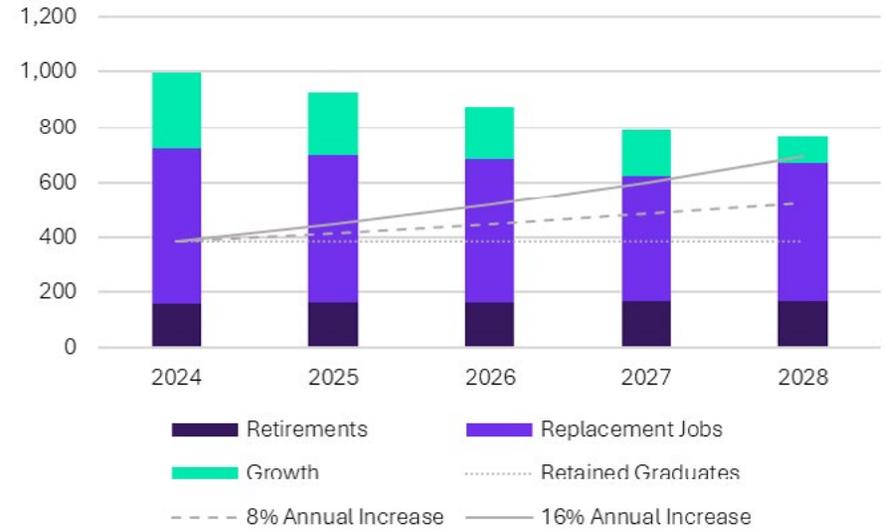
Based on current graduation and retention trends- and the wide array of curricula that can be leveraged to become a successful sales manager, there appears to be no projected gap between grads and jobs in this collection of occupations. Clearly familiarity with tech systems and products is necessary to successfully sale them, however, most of this can be gained via on-the-job experience and, in many cases, technical subject matter experts are made available to sales managers when required for customer interfacing.

| | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 |
|---------------------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| RETAINED GRADUATES | 1,444 | 1,444 | 1,444 | 1,444 | 1,444 | 1,444 | 1,444 | 1,444 | 1,444 | 1,444 | 1,444 |
| 1% ANNUAL INCREASE | 1,444 | 1,458 | 1,473 | 1,488 | 1,503 | 1,518 | 1,533 | 1,548 | 1,564 | 1,579 | 1,595 |
| 2% ANNUAL INCREASE | 1,444 | 1,473 | 1,502 | 1,532 | 1,563 | 1,594 | 1,626 | 1,659 | 1,692 | 1,726 | 1,760 |
| RETIREMENTS | 230 | 233 | 236 | 238 | 238 | 239 | 240 | 241 | 241 | 242 | 242 |
| REPLACEMENT JOBS | 725 | 744 | 762 | 731 | 836 | 782 | 786 | 795 | 800 | 801 | 804 |
| GROWTH | 183 | 140 | 106 | 83 | 20 | 62 | 47 | 32 | 22 | 13 | 2 |
| SURPLUS/DEFICIT, CURRENT RATES | 305 | 326 | 340 | 393 | 351 | 360 | 370 | 376 | 381 | 388 | 396 |

SOC 11-3021: COMPUTER AND INFORMATION SYSTEMS MANAGERS, 10-YEAR ESTIMATES



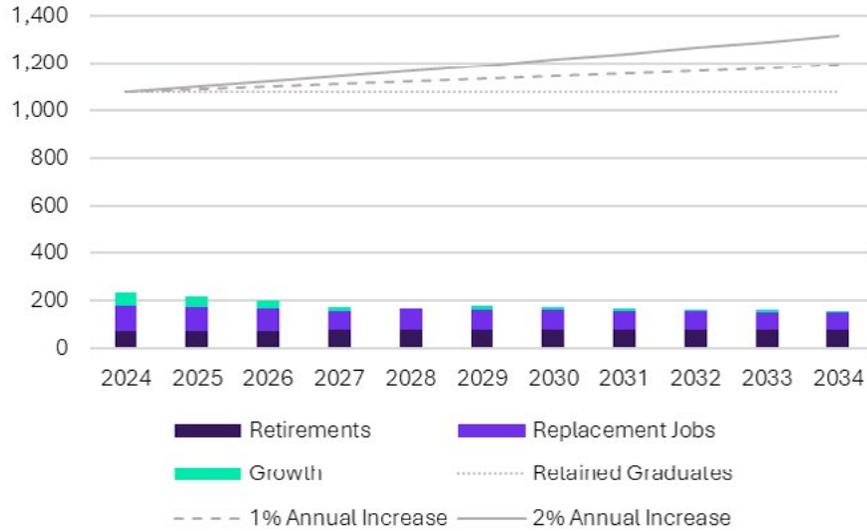
SOC 11-3021: COMPUTER AND INFORMATION SYSTEMS MANAGERS, 5-YEAR ESTIMATES



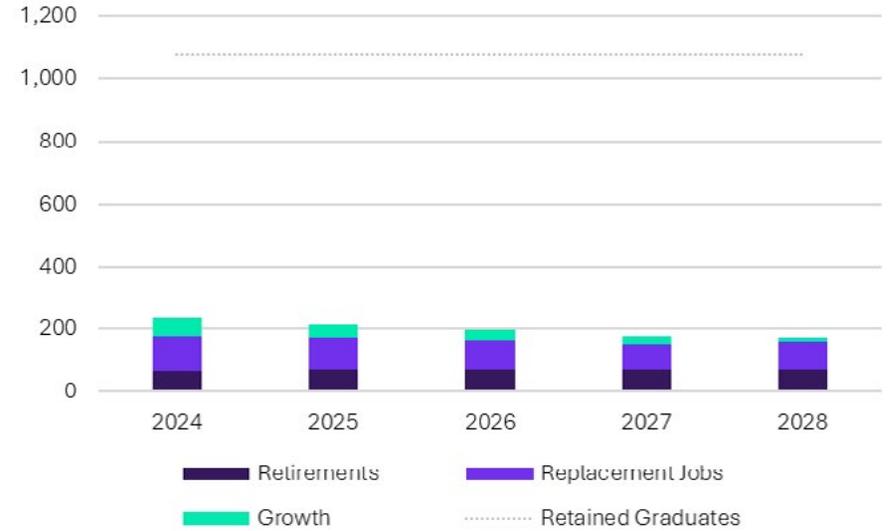
For SOC 11-3021, Computer and Information Systems Managers, a significant gap appears in both the 5- and 10-year graphs above. If we take a longer approach toward improving graduation and retention trends, improving the number of retained grads by 6% each year will lead to a balance between supply and demand by 2034. To reach this point of equilibrium in 5 years, the number of retained grads will need to increase by 16% annually.

| | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 |
|--------------------------------|------|------|------|------|------|------|------|------|------|------|------|
| RETAINED GRADUATES | 384 | 384 | 384 | 384 | 384 | 384 | 384 | 384 | 384 | 384 | 384 |
| 3% ANNUAL INCREASE | 384 | 396 | 407 | 420 | 432 | 445 | 459 | 472 | 486 | 501 | 516 |
| 6% ANNUAL INCREASE | 384 | 407 | 431 | 457 | 485 | 514 | 545 | 577 | 612 | 649 | 688 |
| RETIREMENTS | 156 | 161 | 165 | 168 | 170 | 173 | 175 | 178 | 179 | 181 | 182 |
| REPLACEMENT JOBS | 564 | 537 | 517 | 453 | 500 | 487 | 479 | 468 | 459 | 449 | 389 |
| GROWTH | 277 | 229 | 192 | 165 | 93 | 136 | 117 | 104 | 88 | 75 | 62 |
| SURPLUS/DEFICIT, CURRENT RATES | -613 | -543 | -491 | -402 | -380 | -412 | -388 | -366 | -342 | -321 | -250 |

SOC 11-9041: ARCHITECTURAL AND ENGINEERING MANAGERS, 10 YEAR ESTIMATES



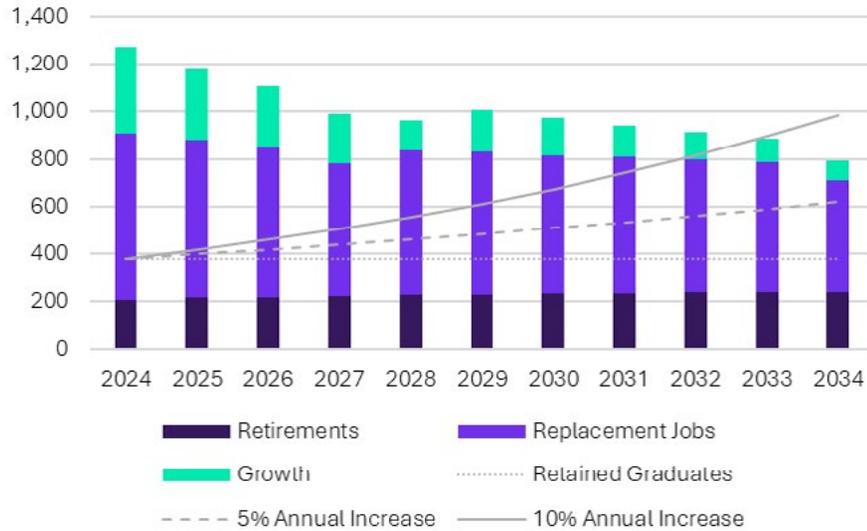
SOC 11-9041: ARCHITECTURAL AND ENGINEERING MANAGERS, 5-YEAR ESTIMATES



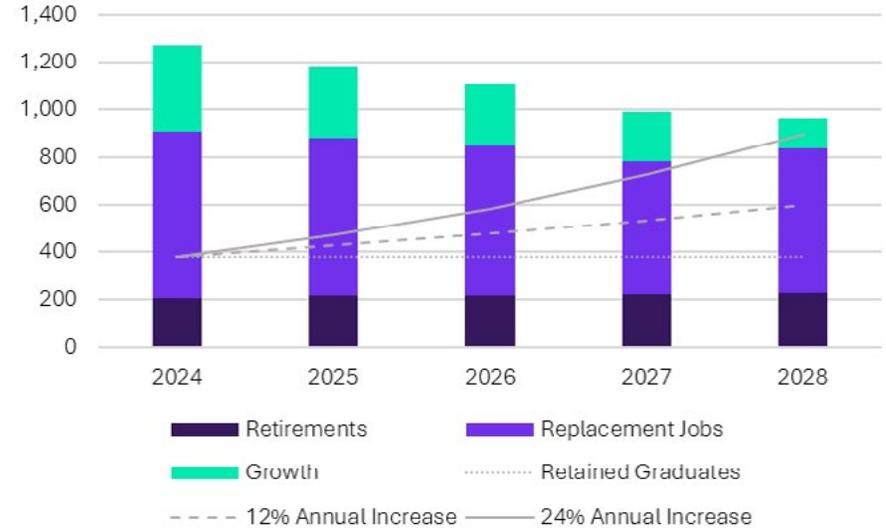
Based on the review of qualified grads and annual openings, the region appears to already enjoy a surplus of qualified Architectural and Engineering Managers, although it should be noted that many of these jobs will require work experience in the field beyond a college degree. Our 10-year estimates are graphed above and 5-year estimates below.

| | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 |
|---------------------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| RETAINED GRADUATES | 1,080 | 1,080 | 1,080 | 1,080 | 1,080 | 1,080 | 1,080 | 1,080 | 1,080 | 1,080 | 1,080 |
| 1% ANNUAL INCREASE | 1,080 | 1,091 | 1,102 | 1,113 | 1,124 | 1,135 | 1,146 | 1,158 | 1,169 | 1,181 | 1,193 |
| 2% ANNUAL INCREASE | 1,080 | 1,102 | 1,124 | 1,146 | 1,169 | 1,192 | 1,216 | 1,241 | 1,265 | 1,291 | 1,317 |
| RETIREMENTS | 69 | 70 | 71 | 72 | 72 | 73 | 74 | 74 | 74 | 74 | 75 |
| REPLACEMENT JOBS | 110 | 101 | 93 | 79 | 88 | 87 | 83 | 79 | 77 | 74 | 71 |
| GROWTH | 56 | 44 | 35 | 26 | 10 | 20 | 17 | 14 | 9 | 6 | 3 |
| SURPLUS/DEFICIT, CURRENT RATES | 846 | 864 | 881 | 904 | 909 | 901 | 906 | 913 | 920 | 925 | 931 |

SOC 15-1210: COMPUTER AND INFORMATION ANALYSTS, 10-YEAR ESTIMATES MADE UP OF SOCS 15-1211 (COMPUTER SYSTEMS ANALYSTS) AND 15-1212 (INFORMATION SECURITY ANALYSTS)



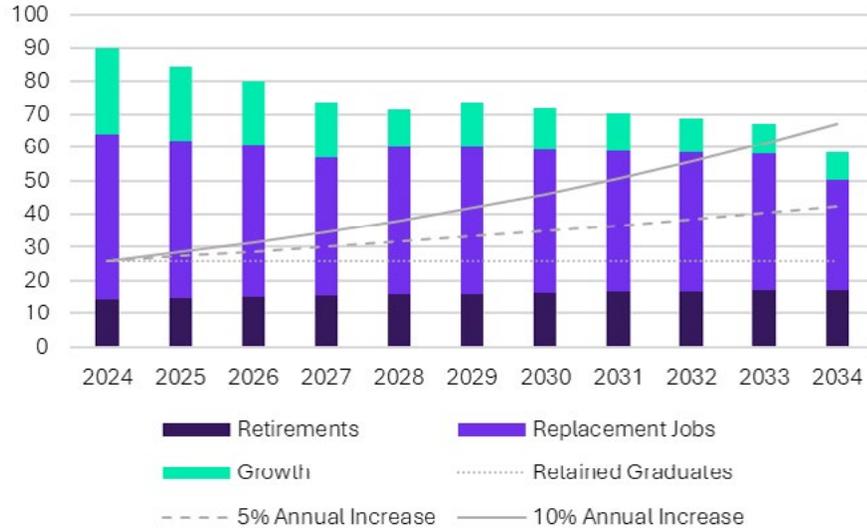
SOC 15-1210: COMPUTER AND INFORMATION ANALYSTS, 5-YEAR ESTIMATES



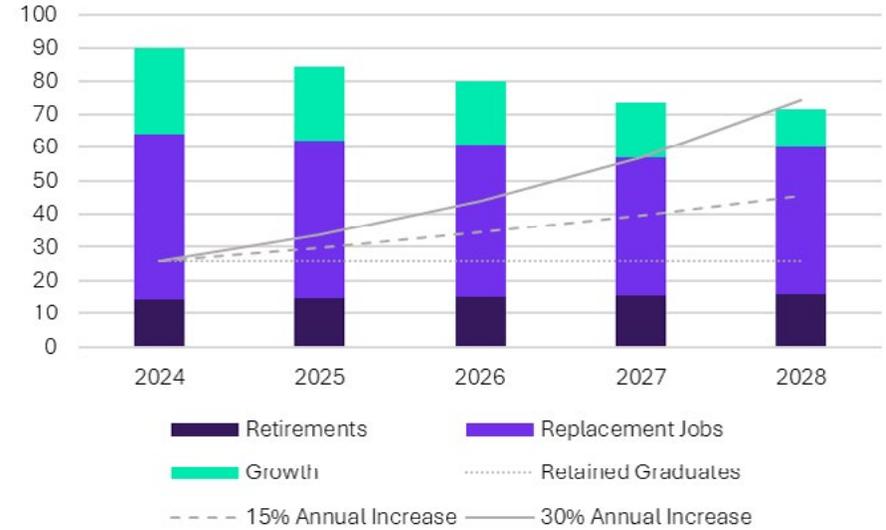
The Computer and Information Analysts family of occupations faces a significant gap between retained regional graduates and open positions, one that will require an aggressive retention campaign for local graduates. To reach a balance between supply and demand by the year 2034 (based on current occupation growth projections), the region will need to increase retention rates by approximately 10% annually. To reach this milestone in only 5 years, rates will need to increase by 24% annually.

| | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 |
|--------------------------------|------|------|------|------|------|------|------|------|------|------|------|
| RETAINED GRADUATES | 380 | 380 | 380 | 380 | 380 | 380 | 380 | 380 | 380 | 380 | 380 |
| 5% ANNUAL INCREASE | 380 | 399 | 419 | 440 | 462 | 485 | 509 | 535 | 561 | 590 | 619 |
| 10% ANNUAL INCREASE | 380 | 418 | 460 | 506 | 556 | 612 | 673 | 741 | 815 | 896 | 986 |
| RETIREMENTS | 210 | 216 | 221 | 225 | 227 | 231 | 234 | 237 | 239 | 241 | 243 |
| REPLACEMENT JOBS | 699 | 664 | 635 | 555 | 612 | 598 | 583 | 570 | 558 | 545 | 465 |
| GROWTH | 363 | 298 | 252 | 213 | 125 | 176 | 156 | 135 | 117 | 101 | 83 |
| SURPLUS/DEFICIT, CURRENT RATES | -892 | -798 | -728 | -613 | -584 | -626 | -594 | -562 | -535 | -507 | -411 |

SOC 15-1221: COMPUTER AND INFORMATION RESEARCH SCIENTISTS, 10-YEAR ESTIMATES



SOC 15-1221: COMPUTER AND INFORMATION RESEARCH SCIENTISTS, 5-YEAR ESTIMATES

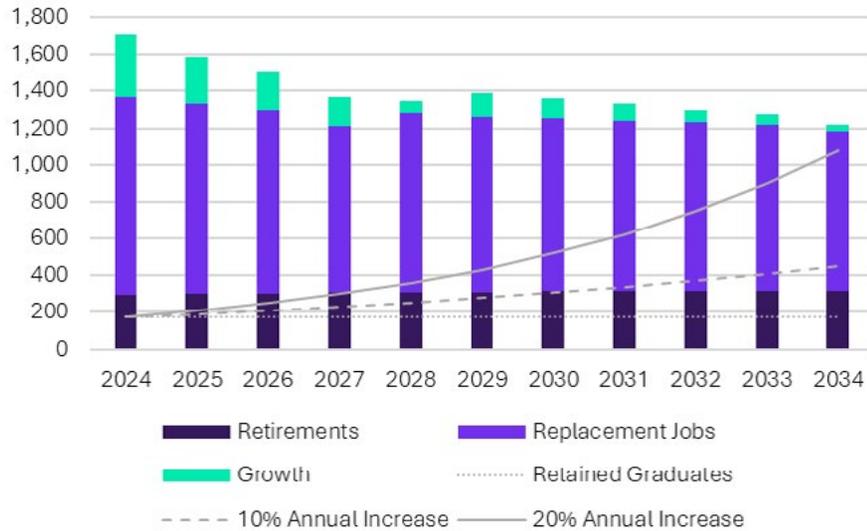


Computer and Information research scientists also will require a significant uptick in percent retention to reach equilibrium, at a rate of 30% per year to achieve this balance by 2028. In real numbers, however, it must be noted in 2024, there is a projected deficit of 64- not insignificant, but not as acute in magnitude as other occupations.

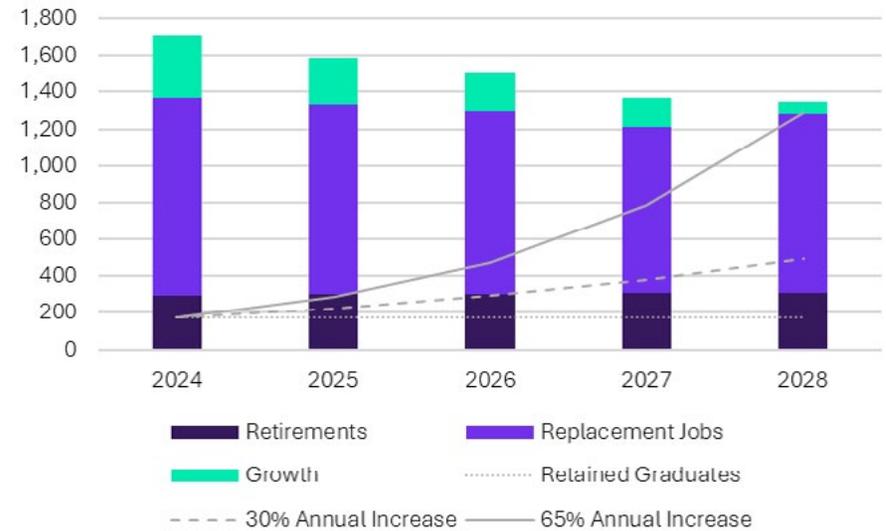
SOC 15-1221: COMPUTER AND INFORMATION RESEARCH SCIENTISTS

| | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 |
|--------------------------------|------|------|------|------|------|------|------|------|------|------|------|
| RETAINED GRADUATES | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |
| 5% ANNUAL INCREASE | 26 | 27 | 29 | 30 | 32 | 33 | 35 | 37 | 38 | 40 | 42 |
| 10% ANNUAL INCREASE | 26 | 29 | 31 | 35 | 38 | 42 | 46 | 51 | 56 | 61 | 67 |
| RETIREMENTS | 14 | 15 | 15 | 16 | 16 | 16 | 16 | 17 | 17 | 17 | 17 |
| REPLACEMENT JOBS | 50 | 48 | 46 | 42 | 44 | 44 | 43 | 42 | 42 | 41 | 33 |
| GROWTH | 26 | 22 | 19 | 16 | 11 | 14 | 13 | 11 | 10 | 9 | 8 |
| SURPLUS/DEFICIT, CURRENT RATES | -64 | -58 | -54 | -48 | -45 | -48 | -46 | -44 | -43 | -41 | -33 |

SOC 15-1230: COMPUTER SUPPORT SPECIALISTS, 10-YEAR ESTIMATES MADE UP OF SOC 15-1231 (COMPUTER NETWORK SUPPORT SPECIALISTS) AND 15-1232 (COMPUTER USER SUPPORT SPECIALISTS)



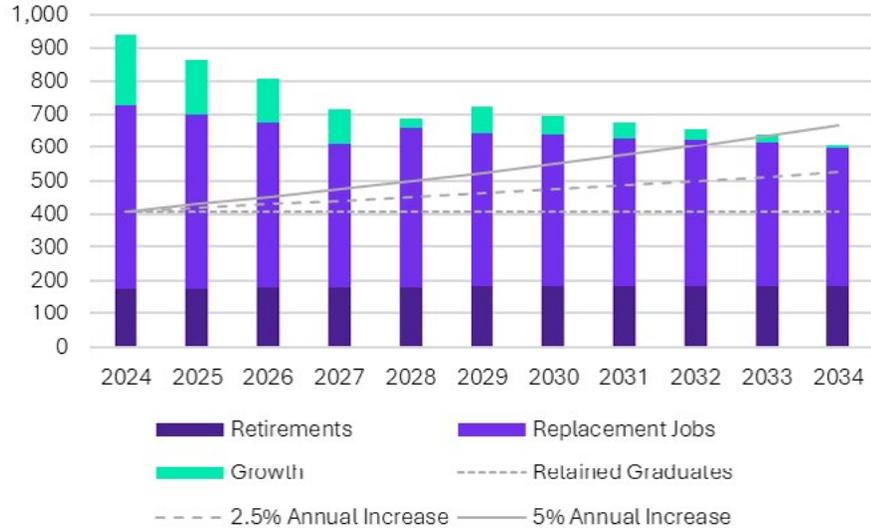
SOC 15-1230: COMPUTER SUPPORT SPECIALISTS, 5-YEAR ESTIMATES



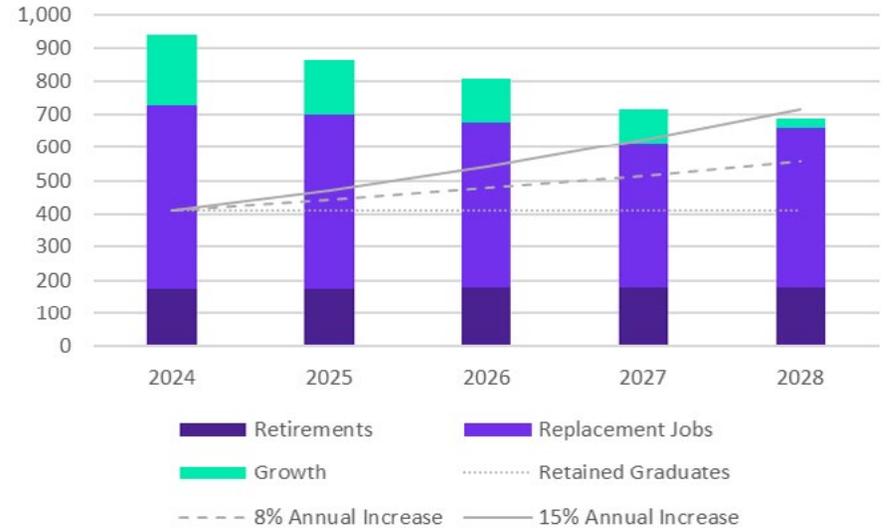
Already facing a significant gap between retained graduates and job openings in the region in 2024 of **1,531**, retention rates for Computer Support Specialists will need to increase at a large rate to reach equilibrium, by either 2028 or 2034. To reach a point where the number of retained graduates is equal to the number of projected openings in the next 5 years, retention rates will need to increase by 65%, year over year.

| | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 |
|--------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| RETAINED GRADUATES | 174 | 174 | 174 | 174 | 174 | 174 | 174 | 174 | 174 | 174 | 174 |
| 10% ANNUAL INCREASE | 174 | 191 | 211 | 232 | 255 | 280 | 308 | 339 | 373 | 410 | 451 |
| 20% ANNUAL INCREASE | 174 | 209 | 251 | 301 | 361 | 433 | 520 | 623 | 748 | 898 | 1,077 |
| RETIREMENTS | 297 | 301 | 305 | 308 | 309 | 311 | 313 | 315 | 316 | 317 | 317 |
| REPLACEMENT JOBS | 1,069 | 1,029 | 992 | 902 | 971 | 952 | 943 | 926 | 913 | 904 | 866 |
| GROWTH | 340 | 258 | 206 | 160 | 63 | 128 | 103 | 89 | 68 | 51 | 36 |
| SURPLUS/DEFICIT, CURRENT RATES | -1,531 | -1,414 | -1,330 | -1,196 | -1,168 | -1,217 | -1,185 | -1,156 | -1,123 | -1,097 | -1,045 |

SOC 15-1240: DATABASE AND NETWORK ADMINISTRATORS AND ARCHITECTS, 10-YEAR ESTIMATES



SOC 15-1240: DATABASE AND NETWORK ADMINISTRATORS AND ARCHITECTS, 5-YEAR ESTIMATES



SOC 15-1240: DATABASE AND NETWORK ADMINISTRATORS AND ARCHITECTS, MADE UP OF:

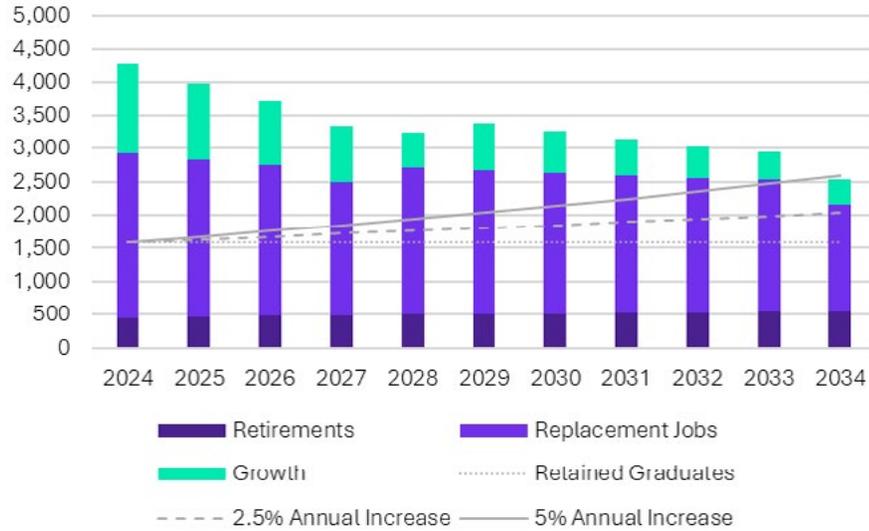
| | |
|---------|---|
| 15-1241 | Computer Network Architects |
| 15-1242 | Database Administrators |
| 15-1243 | Database Architects |
| 15-1244 | Network and Computer Systems Administrators |

Based on current estimates of a gap of 532 retained graduates, we estimate that for the region to ensure a retained graduate for every Database and Network Administrator opening by the year 2028 it will need to increase retention rates by 15%, year-over-year.

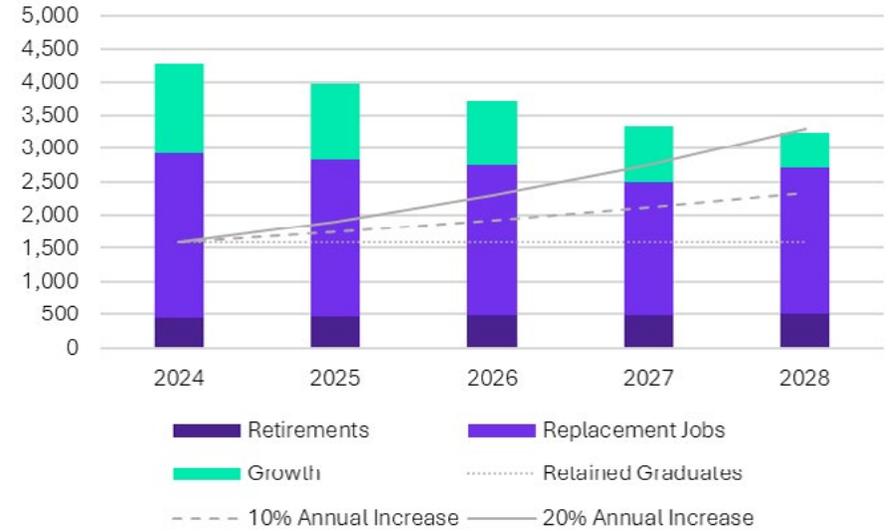
SOC 15-1240: DATABASE AND NETWORK ADMINISTRATORS AND ARCHITECTS

| | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 |
|--------------------------------|------|------|------|------|------|------|------|------|------|------|------|
| RETAINED GRADUATES | 410 | 410 | 410 | 410 | 410 | 410 | 410 | 410 | 410 | 410 | 410 |
| 2.5% ANNUAL INCREASE | 410 | 420 | 431 | 442 | 453 | 464 | 475 | 487 | 500 | 512 | 525 |
| 5% ANNUAL INCREASE | 410 | 431 | 452 | 475 | 498 | 523 | 549 | 577 | 606 | 636 | 668 |
| RETIREMENTS | 174 | 177 | 179 | 181 | 181 | 182 | 183 | 184 | 185 | 185 | 185 |
| REPLACEMENT JOBS | 553 | 523 | 499 | 433 | 480 | 464 | 457 | 446 | 439 | 431 | 412 |
| GROWTH | 215 | 165 | 129 | 101 | 27 | 76 | 57 | 46 | 33 | 24 | 14 |
| SURPLUS/DEFICIT, CURRENT RATES | -532 | -455 | -397 | -304 | -278 | -312 | -287 | -266 | -247 | -230 | -201 |

SOC 15-1250: SOFTWARE AND WEB DEVELOPERS, PROGRAMMERS, AND TESTERS, 10-YEAR ESTIMATES



SOC 15-1250: SOFTWARE AND WEB DEVELOPERS, PROGRAMMERS, AND TESTERS, 5-YEAR ESTIMATES



SOC 15-1250: SOFTWARE AND WEB DEVELOPERS, PROGRAMMERS, AND TESTERS, MADE UP OF:

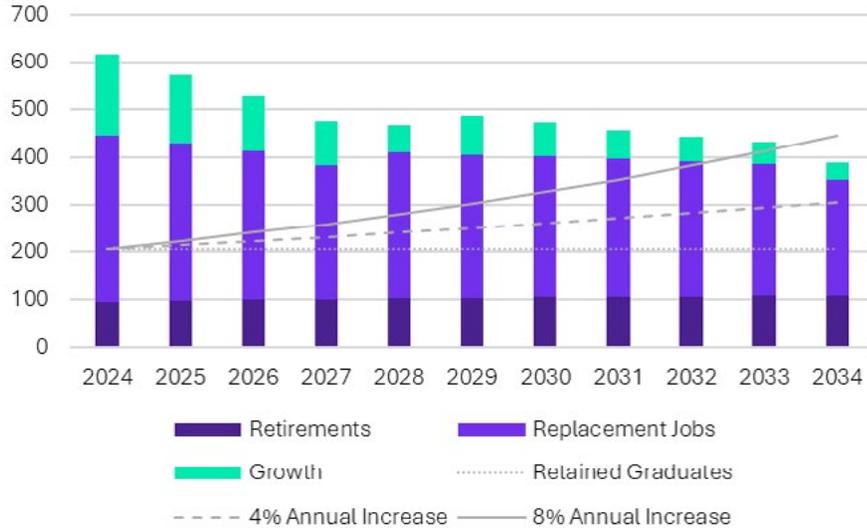
| | |
|---------|---|
| 15-1251 | Computer Programmers |
| 15-1252 | Software Developers |
| 15-1253 | Software Quality Assurance Analysts and Testers |
| 15-1254 | Web Developers |
| 15-1255 | Web and Digital Interface Designers |

Based on 10-year projections, to reach a balance between openings and retained graduates, retention rates will need to increase by 5% annually. To reach this balance by 2028, the rate will need to increase by 20% annually.

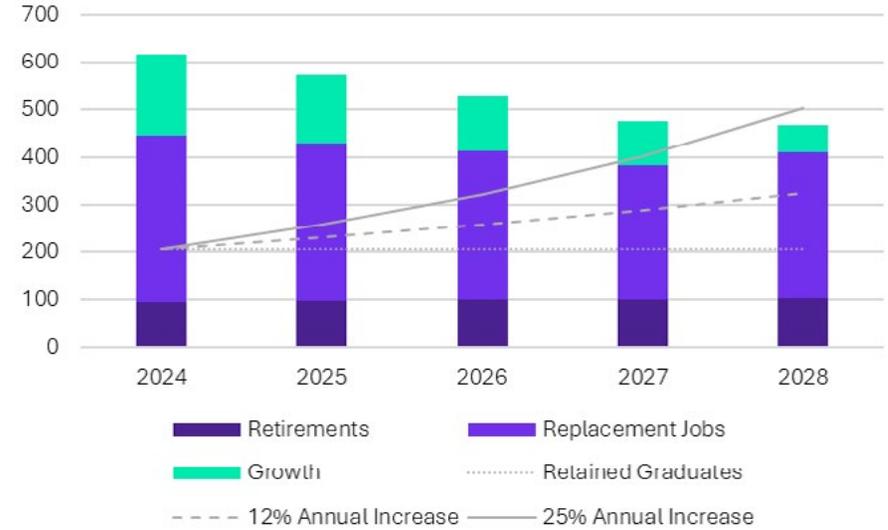
SOC 15-1250: SOFTWARE AND WEB DEVELOPERS, PROGRAMMERS, AND TESTERS

| | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 |
|--------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|
| RETAINED GRADUATES | 1,594 | 1,594 | 1,594 | 1,594 | 1,594 | 1,594 | 1,594 | 1,594 | 1,594 | 1,594 | 1,594 |
| 2.5% ANNUAL INCREASE | 1,594 | 1,634 | 1,675 | 1,717 | 1,759 | 1,803 | 1,849 | 1,895 | 1,942 | 1,991 | 2,040 |
| 5% ANNUAL INCREASE | 1,594 | 1,674 | 1,757 | 1,845 | 1,938 | 2,034 | 2,136 | 2,243 | 2,355 | 2,473 | 2,596 |
| RETIREMENTS | 446 | 461 | 475 | 487 | 494 | 504 | 513 | 521 | 528 | 534 | 539 |
| REPLACEMENT JOBS | 2,489 | 2,371 | 2,279 | 2,015 | 2,212 | 2,161 | 2,116 | 2,072 | 2,033 | 1,995 | 1,624 |
| GROWTH | 1,353 | 1,138 | 972 | 840 | 532 | 713 | 630 | 557 | 489 | 429 | 370 |
| SURPLUS/DEFICIT, CURRENT RATES | -2,693 | -2,376 | -2,132 | -1,749 | -1,644 | -1,785 | -1,665 | -1,556 | -1,456 | -1,363 | -939 |

SOC 15-1290: COMPUTER OCCUPATIONS, ALL OTHER, 10-YEAR ESTIMATES



SOC 15-1290: COMPUTER OCCUPATIONS, ALL OTHER, 5-YEAR ESTIMATES

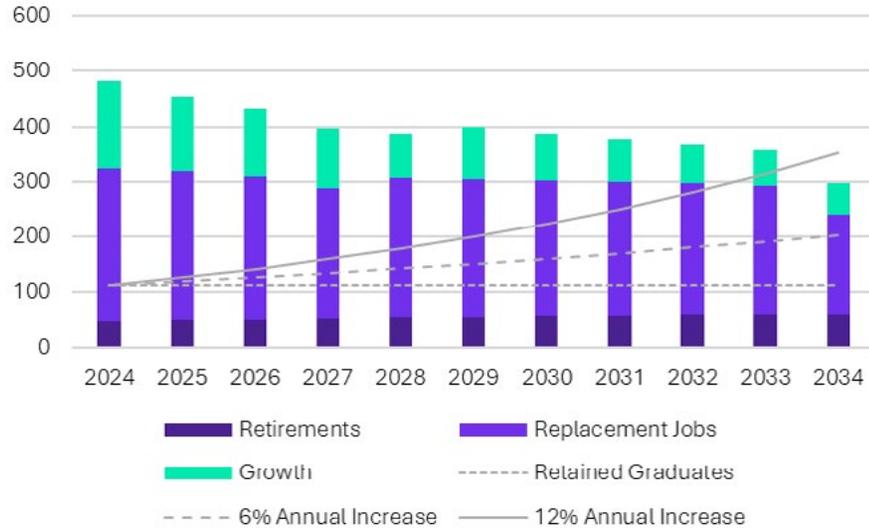


Starting from a deficit of **411** in 2024, to reach a balance between regional grads and job openings, retention rates will need to be increased by 25% annually to reach a point of equilibrium by 2028. To achieve this balance by 2034, those rates will need to increase by 8%.

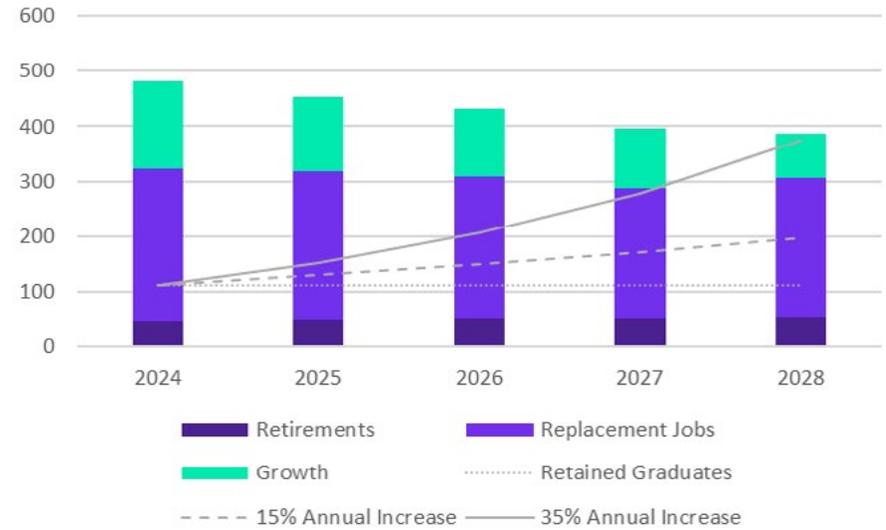
SOC 15-1290: COMPUTER OCCUPATIONS

| | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 |
|--------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| RETAINED GRADUATES | 206 | 206 | 206 | 206 | 206 | 206 | 206 | 206 | 206 | 206 | 206 |
| 4% ANNUAL INCREASE | 206 | 214 | 223 | 232 | 241 | 251 | 261 | 271 | 282 | 293 | 305 |
| 8% ANNUAL INCREASE | 206 | 222 | 240 | 260 | 280 | 303 | 327 | 353 | 381 | 412 | 445 |
| RETIREMENTS | 95 | 97 | 100 | 101 | 102 | 104 | 105 | 107 | 108 | 108 | 109 |
| REPLACEMENT JOBS | 352 | 333 | 313 | 281 | 308 | 302 | 296 | 289 | 283 | 278 | 242 |
| GROWTH | 171 | 142 | 117 | 92 | 56 | 81 | 71 | 62 | 52 | 44 | 37 |
| SURPLUS/DEFICIT, CURRENT RATES | -411 | -366 | -324 | -269 | -261 | -281 | -266 | -252 | -237 | -225 | -183 |

SOC 15-2051: DATA SCIENTISTS, 10-YEAR ESTIMATES



SOC 15-2051: DATA SCIENTISTS, 5-YEAR ESTIMATES

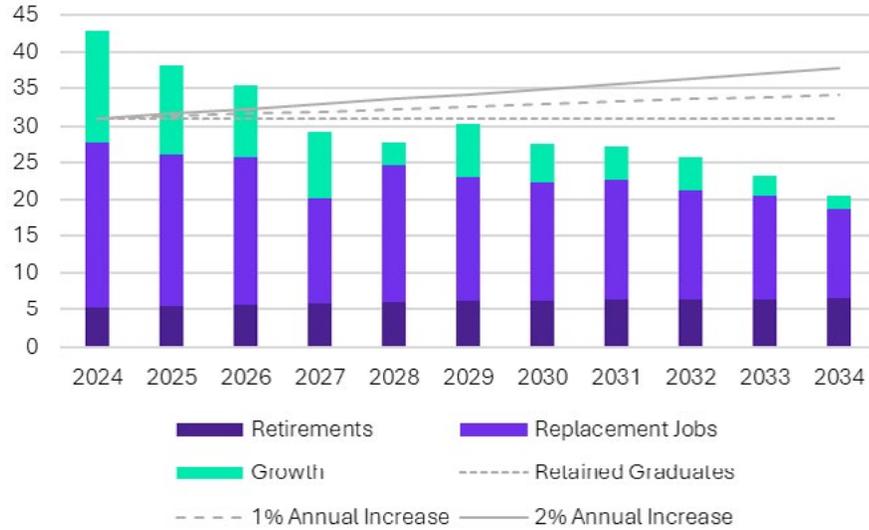


In 2024 there is a projected deficit of retained Data Scientists in the region of 368, an imbalance between supply and job opening demand that can be corrected by 2028 with a 35% annual increase in retained grads. To achieve balance by 2034, the number of retained regional grads must increase by 12% annually.

SOC 15-2051: DATA SCIENTISTS

| | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 |
|--------------------------------|------|------|------|------|------|------|------|------|------|------|------|
| RETAINED GRADUATES | 113 | 113 | 113 | 113 | 113 | 113 | 113 | 113 | 113 | 113 | 113 |
| 6% ANNUAL INCREASE | 113 | 120 | 127 | 135 | 143 | 151 | 160 | 170 | 180 | 191 | 202 |
| 12% ANNUAL INCREASE | 113 | 127 | 142 | 159 | 178 | 199 | 223 | 250 | 280 | 313 | 351 |
| RETIREMENTS | 46 | 48 | 50 | 51 | 52 | 54 | 55 | 56 | 57 | 58 | 59 |
| REPLACEMENT JOBS | 277 | 270 | 260 | 237 | 254 | 251 | 246 | 243 | 239 | 235 | 180 |
| GROWTH | 159 | 136 | 123 | 108 | 80 | 94 | 87 | 78 | 71 | 64 | 57 |
| SURPLUS/DEFICIT, CURRENT RATES | -368 | -341 | -320 | -283 | -274 | -286 | -274 | -264 | -254 | -244 | -183 |

SOC 17-2061: COMPUTER HARDWARE ENGINEERS, 10-YEAR ESTIMATES



Based on current retention trends, graphed above, the region will reach equilibrium between supply and demand by 2028 with no changes in retention rates. In 2024, there is a deficit of 12 retained grads, however, with around 40 projected job openings per year in the region, Computer Hardware Engineers should not be considered a gap of critical proportions.

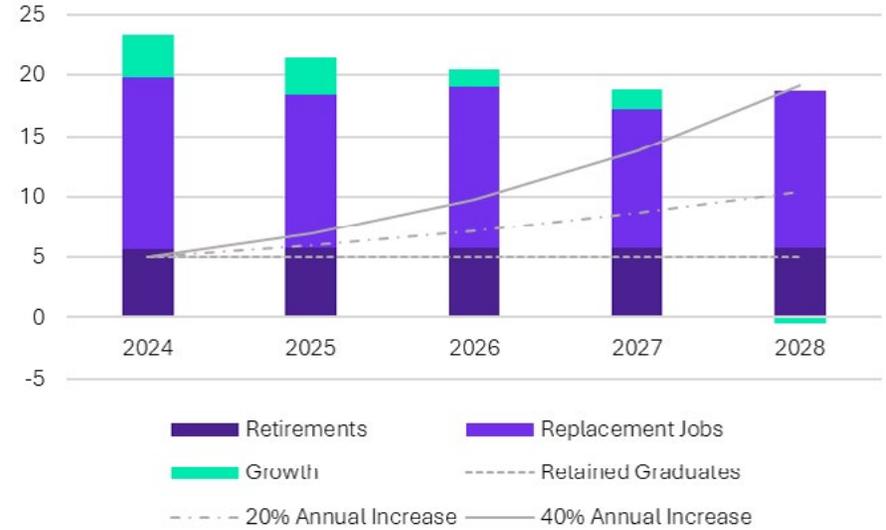
SOC 17-2061: COMPUTER HARDWARE ENGINEERS

| | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 |
|--------------------------------|------|------|------|------|------|------|------|------|------|------|------|
| RETAINED GRADUATES | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 |
| 1% ANNUAL INCREASE | 31 | 31 | 32 | 32 | 32 | 33 | 33 | 33 | 34 | 34 | 34 |
| 2% ANNUAL INCREASE | 31 | 32 | 32 | 33 | 34 | 34 | 35 | 36 | 36 | 37 | 38 |
| RETIREMENTS | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 |
| REPLACEMENT JOBS | 22 | 20 | 20 | 14 | 19 | 17 | 16 | 16 | 15 | 14 | 12 |
| GROWTH | 15 | 12 | 10 | 9 | 3 | 7 | 5 | 4 | 4 | 3 | 2 |
| SURPLUS/DEFICIT, CURRENT RATES | -12 | -7 | -4 | 2 | 3 | 1 | 3 | 4 | 5 | 8 | 11 |

SOC 17-3012: ELECTRICAL AND ELECTRONICS DRAFTERS, 10-YEAR ESTIMATES



SOC 17-3012: ELECTRICAL AND ELECTRONICS DRAFTERS, 5-YEAR ESTIMATES

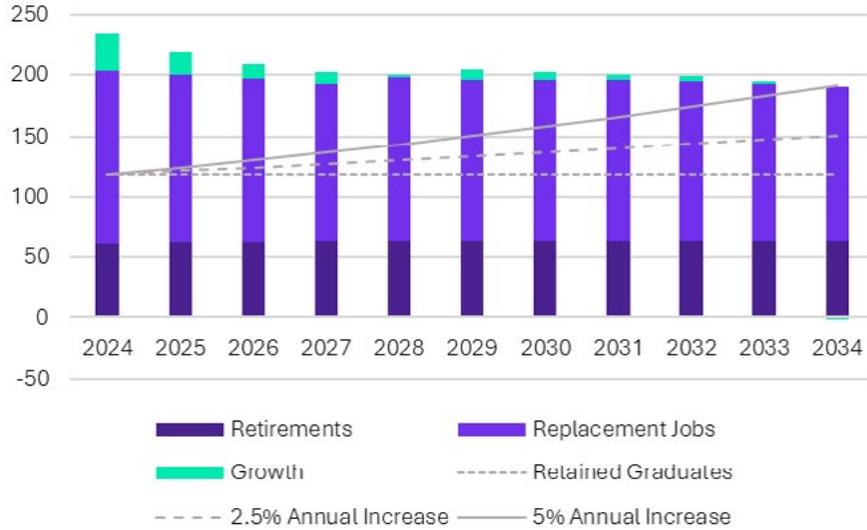


For SOC 17-3012, in 2024, there were 24 openings with an estimated 5 retained graduates. Again, in terms of percent increase, the rate of change needed to reach equilibrium by 2028 is aggressive, requiring an improvement of 40% per year. In absolute numbers, however, it is also important to keep in mind that this 40% annual increase equates to keeping 19 instead of 5 graduates in the region annually.

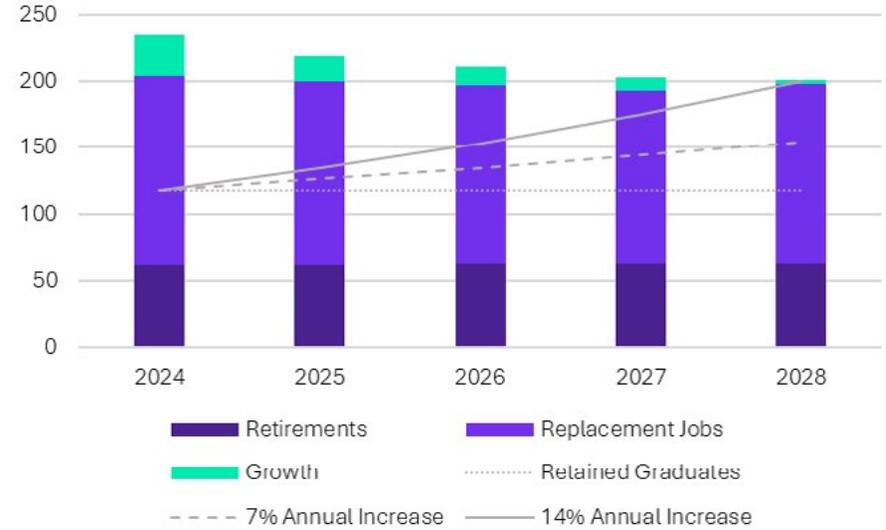
SOC 17-3012: ELECTRICAL AND ELECTRONICS DRAFTERS

| | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 |
|--------------------------------|------|------|------|------|------|------|------|------|------|------|------|
| RETAINED GRADUATES | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| 10% ANNUAL INCREASE | 5 | 6 | 6 | 7 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| 15% ANNUAL INCREASE | 5 | 6 | 7 | 8 | 9 | 10 | 12 | 13 | 15 | 18 | 20 |
| RETIREMENTS | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| REPLACEMENT JOBS | 14 | 13 | 13 | 11 | 13 | 12 | 12 | 12 | 11 | 11 | 11 |
| GROWTH | 4 | 3 | 1 | 2 | -1 | 1 | 0 | 0 | 0 | -2 | -1 |
| SURPLUS/DEFICIT, CURRENT RATES | -18 | -17 | -15 | -14 | -13 | -14 | -13 | -12 | -12 | -10 | -11 |

SOC 17-3020: ENGINEERING TECHNOLOGISTS AND TECHNICIANS



SOC 17-3020: ENGINEERING TECHNOLOGISTS AND TECHNICIANS



SOC 17-3020: ENGINEERING TECHNOLOGISTS AND TECHNICIANS, EXCEPT DRAFTERS MADE UP OF:

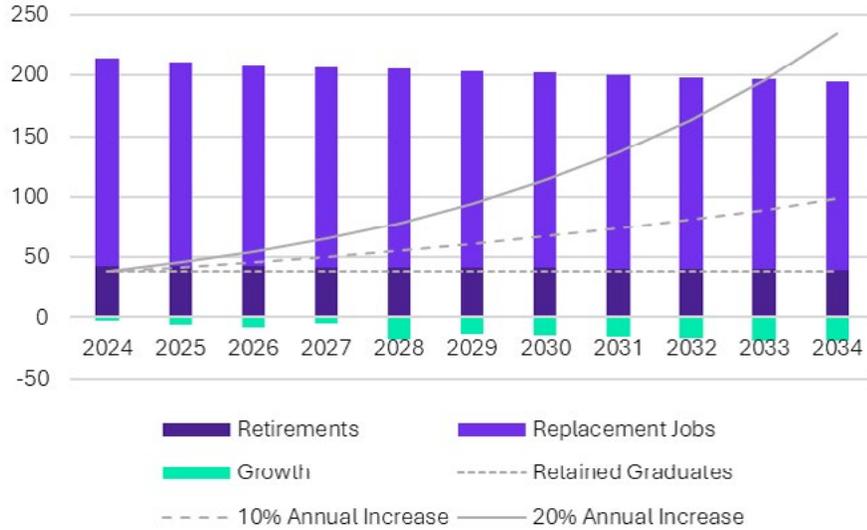
| | |
|---------|---|
| 17-3023 | Electrical and Electronic Engineering Technologists and Technicians |
| 17-3024 | Electro-Mechanical and Mechatronics Technologists and Technicians |
| 17-3027 | Mechanical Engineering Technologists and Technicians |

From a projected starting deficit of 117 retained graduates in 2024, to reach a point of equilibrium between supply and demand by 2034, the region will need to improve its annual retention rate by 5%. To reach this point by 2028, the annual retention rate needs to increase 14%, year-over-year.

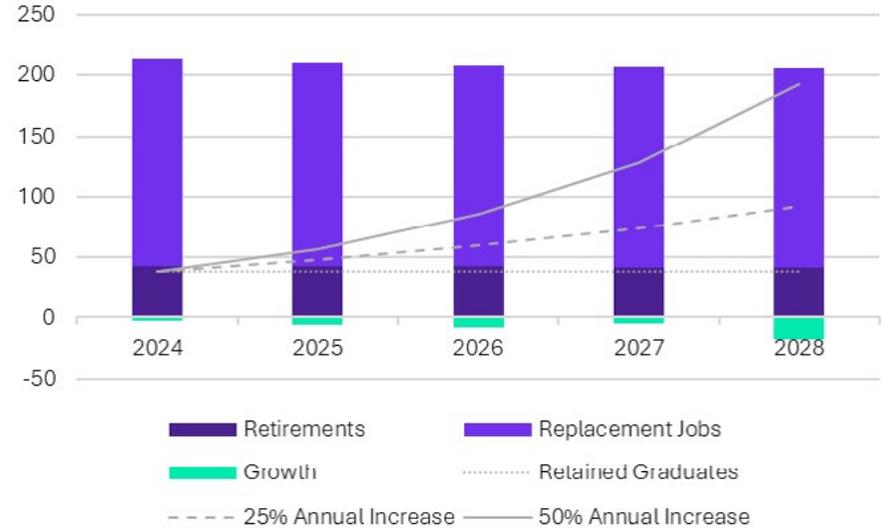
SOC 17-3020: ENGINEERING TECHNOLOGISTS AND TECHNICIANS

| | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 |
|--------------------------------|------|------|------|------|------|------|------|------|------|------|------|
| RETAINED GRADUATES | 118 | 118 | 118 | 118 | 118 | 118 | 118 | 118 | 118 | 118 | 118 |
| 2.5% ANNUAL INCREASE | 118 | 121 | 124 | 127 | 130 | 134 | 137 | 140 | 144 | 147 | 151 |
| 5% ANNUAL INCREASE | 118 | 124 | 130 | 137 | 143 | 151 | 158 | 166 | 174 | 183 | 192 |
| RETIREMENTS | 61 | 62 | 62 | 63 | 63 | 63 | 63 | 63 | 63 | 64 | 63 |
| REPLACEMENT JOBS | 142 | 138 | 135 | 130 | 135 | 133 | 133 | 132 | 132 | 130 | 127 |
| GROWTH | 32 | 20 | 13 | 10 | 3 | 9 | 5 | 4 | 4 | 1 | -1 |
| SURPLUS/DEFICIT, CURRENT RATES | -117 | -102 | -92 | -84 | -83 | -87 | -84 | -82 | -81 | -77 | -71 |

SOC 49-2011: COMPUTER, AUTOMATED TELLER, AND OFFICE MACHINE REPAIRERS, 10-YEAR ESTIMATES



SOC 49-2011: COMPUTER, AUTOMATED TELLER, AND OFFICE MACHINE REPAIRERS



Although the Computer, Automated Teller, and Office Machine Repairers occupation family is projected to see an overall reduction in jobs, both through 2028 and 2034, turnover from retirements and replacement openings will still drive demand over the next decade. To meet this demand with local graduates by 2034, retention rates will need to increase by 20% annually. To meet demand by 2028, these rates need to increase by 50%, year-over-year.

SOC 49-2011: COMPUTER, AUTOMATED TELLER, AND OFFICE MACHINE REPAIRERS

| | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 |
|--------------------------------|------|------|------|------|------|------|------|------|------|------|------|
| RETAINED GRADUATES | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 |
| 10% ANNUAL INCREASE | 38 | 42 | 46 | 51 | 56 | 61 | 67 | 74 | 81 | 90 | 99 |
| 20% ANNUAL INCREASE | 38 | 46 | 55 | 66 | 79 | 95 | 113 | 136 | 163 | 196 | 235 |
| RETIREMENTS | 42 | 42 | 42 | 42 | 42 | 41 | 41 | 41 | 40 | 40 | 40 |
| REPLACEMENT JOBS | 172 | 168 | 167 | 164 | 164 | 162 | 161 | 160 | 158 | 157 | 155 |
| GROWTH | -3 | -6 | -9 | -5 | -18 | -13 | -15 | -16 | -17 | -19 | -19 |
| SURPLUS/DEFICIT, CURRENT RATES | -173 | -167 | -163 | -163 | -150 | -153 | -149 | -146 | -143 | -140 | -138 |

Limitations

The data related to graduates for the gap analysis were gathered through the Integrated Postsecondary Education System Data (IPEDS). This data source is a system of surveys conducted annually by the U.S. Department of Education's National Center for Education Statistics (NCES). The data system collects information from every college, university, and technical and vocational organization used by federal student financial aid programs. However, individuals can receive career training from various sources including online courses, work-based learning programs, vocational training, apprenticeship programs, and bootcamps. It is worth noting that there is a pool of tech workers who may not have completed a "tech training program" measured through IPEDS data but are seeking a job in one of the occupations analyzed throughout the gap analysis. Because there is no monitoring system to capture this information, these individuals are not represented in this analysis.

Institutions and programs that were included in the IPEDS data five-county region include:

- AI Miami International University of Art and Design
- Atlantic Technical College
- Atlantis University
- Ave Maria University
- Barry University
- Broward College
- CBT Technology Institute-Cutler Bay
- CBT Technology Institute-Main Campus
- DeVry University-Florida
- Florida Atlantic University
- Florida Career College-Boynton Beach, Hialeah, Lauderdale Lakes, Miami, West Palm Beach
- Florida Gulf Coast University
- Florida Institute of Technology-Online
- Florida International University
- Florida Memorial University
- Florida National University-Main Campus
- Florida SouthWestern State College
- Florida State University
- FVI School of Nursing and Technology
- Hodges University
- Immokalee Technical College
- InterAmerican Technical Institute
- Jose Maria Vargas University
- Keiser University-Ft Lauderdale
- Lindsey Hopkins Technical College
- Lorenzo Walker Technical College
- Lynn University
- M-DCPS The English Center
- Miami Dade College
- Miami Lakes Educational Center and Technical College
- Millennia Atlantic University
- More Tech Institute
- Nova Southeastern University
- Palm Beach Atlantic University
- Palm Beach State College
- Polytechnic University of Puerto Rico-Miami
- Robert Morgan Educational Center and Technical College
- Sheridan Technical College
- South Florida Institute of Technology
- St. Thomas University
- Strayer University-Florida
- University of Florida
- University of Florida-Online
- University of Miami
- William T McFatter Technical College

Alternative Tech Programs

The purpose of this section is not to quantify the number of students who have completed these programs, but rather provide an overview of “non-traditional” training programs that exist across Miami-Dade County. Because of the volume of online tech training programs across the country, only programs with a physical address in Miami-Dade County were included. These organizations could help support the tech talent development ecosystem alongside other educational institutions and training providers. Information included were the organization’s name, address, website, and public lists of their bootcamps (or short-term training programs) and courses.

| Organization Name | Website | Bootcamps | Courses |
|-------------------|---|---|--|
| GENERAL ASSEMBLY | https://generalassemb.ly/students | <ul style="list-style-type: none"> • Software Engineering • User Experience (UX) Design • Data Science Bootcamp • Data Analytics Bootcamp | <ul style="list-style-type: none"> • Front-End Web Development • User Experience Design • Product Management • Digital Marketing • Data Analytics • Data Science • JavaScript Development • Python Programming • React Development • Visual Design • Other Online Workshops |
| 4GEEKS ACADEMY | https://4geeksacademy.com/us/index?utm_source=google&utm_medium=organic&utm_campaign=mybusiness | <ul style="list-style-type: none"> • Full Stack Developer | <ul style="list-style-type: none"> • Data Science and Machine Learning • Blockchain and Web3 |
| IRONHACK MIAMI | https://www.ironhack.com/us/miami | | <ul style="list-style-type: none"> • Web Development • Data Analytics • UX/UI Design • JavaScript Course • UX Design Course |

| Organization Name | Website | Bootcamps | Courses |
|---|---|--|---|
| BRAINSTATION/ WYNCODE | https://brainstation.io/ | <ul style="list-style-type: none"> • Software Engineering • Data Science • Cybersecurity • UX Design • Web Development • Digital Marketing | <ul style="list-style-type: none"> • Data Analytics • Data Science • Artificial Intelligence • Python • UX Design • UI Design • Web Development • Digital Marketing • Social Media Marketing • Search Engine Marketing • Product Management • Design Thinking • Cybersecurity • Design Leadership • Marketing Leadership • Product Leadership |
| THE ACADEMY / THE CODE ACADEMY | https://academyflorida.com/ | <ul style="list-style-type: none"> • Adobe | <ul style="list-style-type: none"> • Google • Microsoft • Amazon Web Services (AWS) • Cisco • CompTIA • Cybersecurity • Web Development • MCA AZURE, MCE AZURE, MCSA, MCSE • Microsoft Office |
| ID TECH / UNIVERSITY OF MIAMI BOOTCAMPS | https://www.idtech.com/ | <ul style="list-style-type: none"> • Coding • Game Development • Robotics • Creative Arts • Math | <ul style="list-style-type: none"> • Coding • Game Development • Robotics • Creative Arts • Math |

| Organization Name | Website | Bootcamps | Courses |
|---|---|---|---|
| MIAMI-DADE COUNTY PUBLIC SCHOOLS: DEPARTMENT OF CAREER AND TECHNICAL EDUCATION | https://dcte.dadeschools.net/#/rightColumn/2767 | <ul style="list-style-type: none"> • N/A | <ul style="list-style-type: none"> • Computer Systems and Information Technology • Cisco Networking Academy • Computer Systems and Information Technology CompTIA Academy • Network Systems Administration • Microsoft IT Academy • Technology Support Services |
| CBT TECHNOLOGY INSTITUTE | https://www.cbt.edu/ | | <ul style="list-style-type: none"> • Network Administration Program: CompTIA LINUX+, CCNA, MCSA, CompTIA Network+ |

Career Pathways

Career pathways in the tech sector have shifted away from more traditional industries in a variety of ways and for a variety of reasons. First and foremost, there is no singular “tech industry.” Tech jobs exist in nearly every industry in one form or another and continue to both expand into others and be the impetus to the creation of new industries altogether. For these reasons and numerous more, developing a traditional career pathway within an industry context is not possible.

To address this barrier, the career pathway examples developed should be viewed as just that: examples that illustrate the flexibility individuals seeking tech-based occupations will encounter in their personal career path, while still providing an overarching shape to those pathways.

The careers chosen to highlight the tech landscape do not cover every occupation assessed in the gap analysis. Rather, these occupations were chosen to illustrate the wider trends in the tech environment, with a focus on two main fields. The first explores career pathways for jobs in computer programming, software development, and cybersecurity, more generally referred to as “Information Technology (IT) Careers.” The second explores career pathways in database management and architecture as well as data and computer research science. These career paths have significantly less career pathway data available at present than careers in engineering or manufacturing and were chosen partially to shed some additional light on this less-studied landscape.

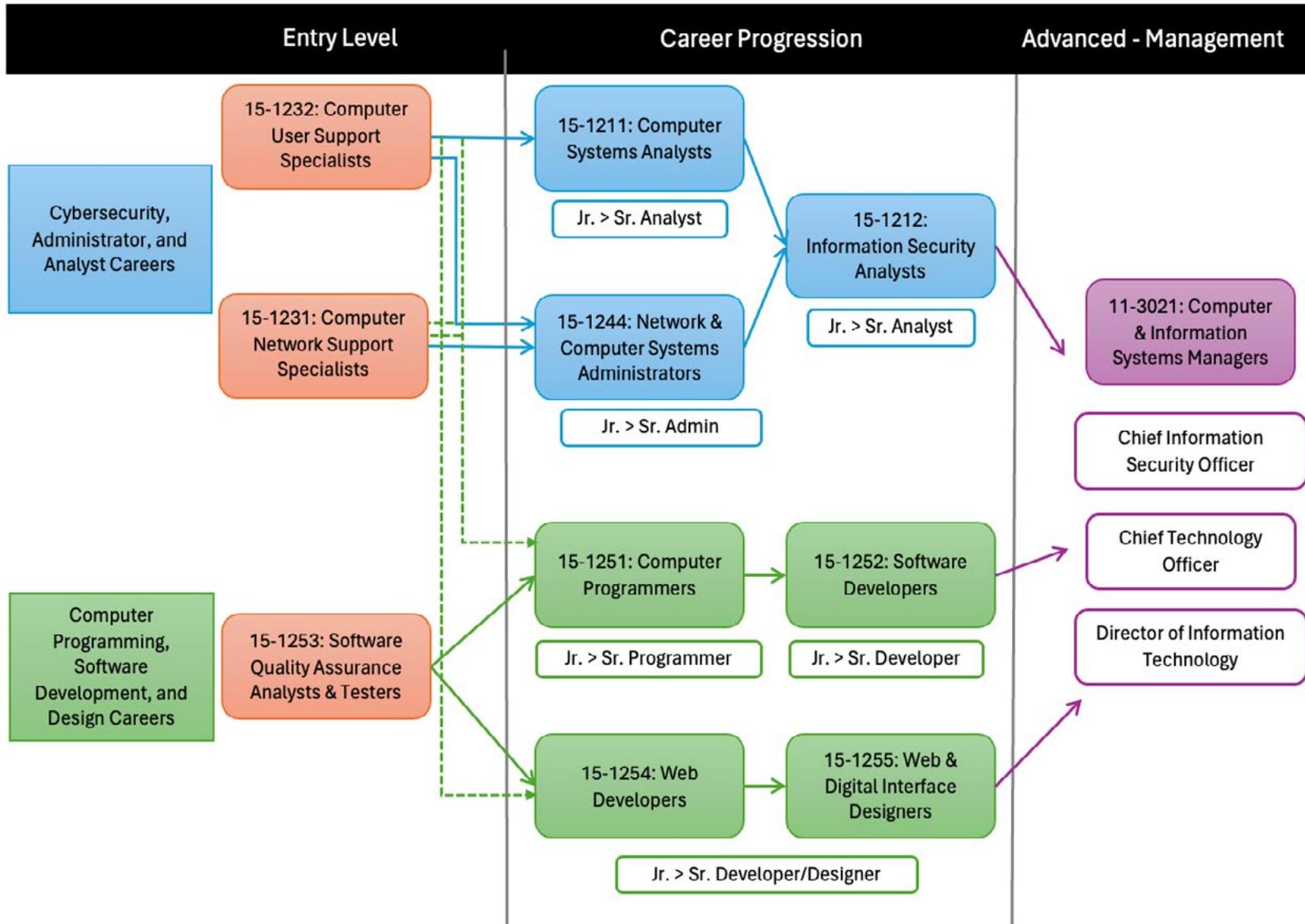
Reading the Pathway Maps

Each map is broken up into 3 sections: “Entry Level,” “Career Progression,” and “Advanced/Management” levels. Both pathway maps showcase an important aspect of jobs in the tech space, which is that while there are a few key entry points, there are many fields and pathways careers can take. It should also be noted that these occupations are designated SOC codes and represent what can be many varying specialties within any given occupation. The second group, “Career Progression,” represents the most fluid and the largest portion of a career. Solid lines depict the most common or clear progression from one occupation group to another, while dotted lines depict less common but still viable career transitions. While some individuals will transfer out of the “Career Progression” phase and into the “Advanced/Management” phase, many will stay in the “Career Progression” part of the map their entire career. Thus, the occupation groups towards the end of this phase should realistically also be viewed as terminal or mature career phases of their own. Additionally, it is notable that the management occupation group is the same across the 2 maps and 4 main career nodes. This should be taken to represent an overall category of tech management/leadership, oftentimes being the Chief Technology or Data Officer, or Director of Research or IT.

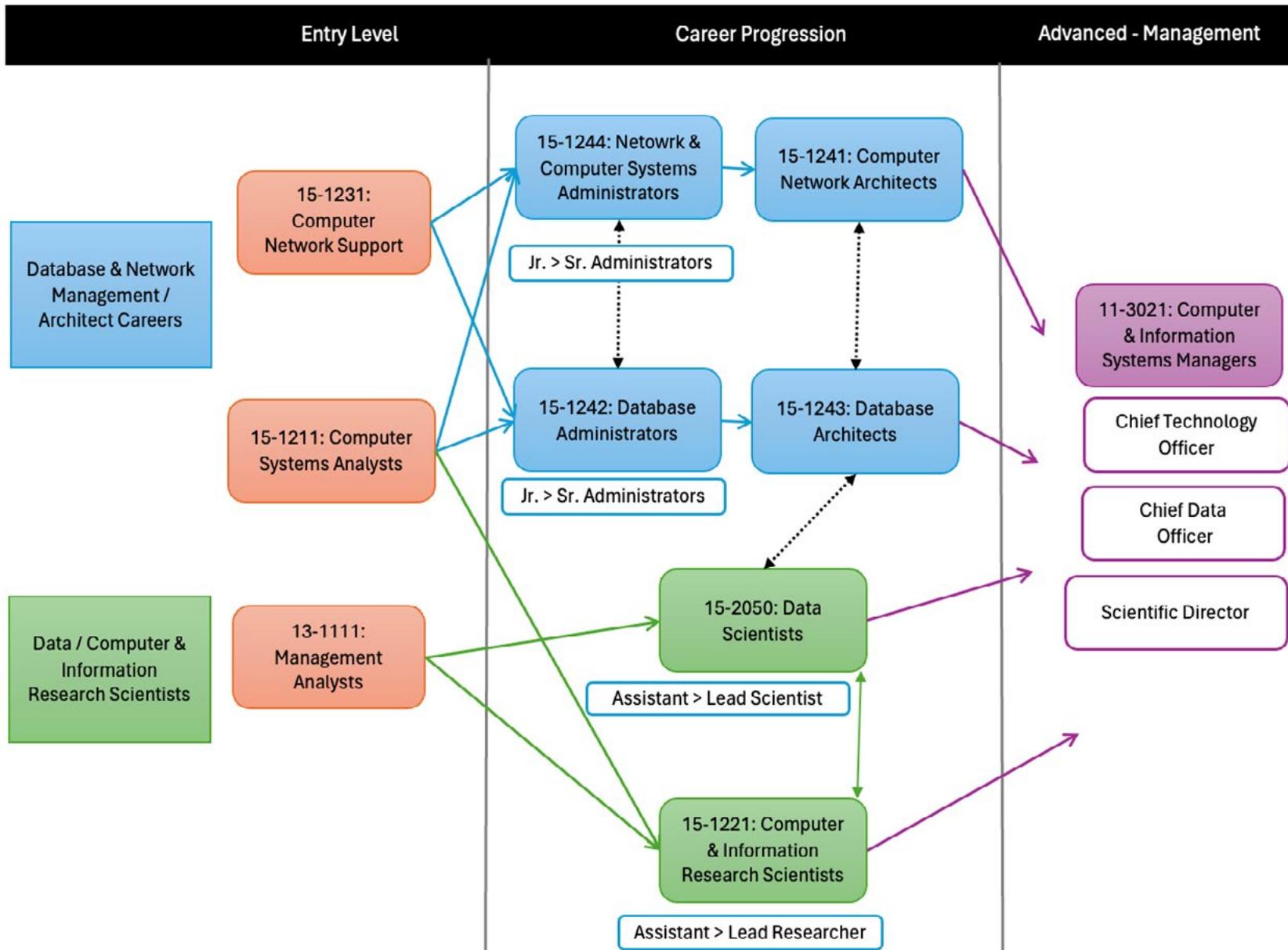
Limitations

These career pathway maps were developed using correlational equations that examine the knowledge, skills, and abilities required for specific jobs and work to understand which entry level job skills will transfer to mid-level jobs, and so on. The knowledge, skills, and abilities are pulled from online data sources such as Lightcast, Census data, and job posting analytics. Based on the scope of work, the project team did not engage with employers to build these career pathways. To account for new innovations and trends, it is important to gather employer input and feedback to inform career pathway maps, especially in the rapidly evolving tech industry. These maps should serve as a starting point for the tech community in Miami Dade County and be continually refined based on feedback from employers as the tech industry continues to evolve.

Information Technology Career Pathways



Database, Networks, and Research Career Pathways





Miami Tech Works

Stakeholder Engagement Summary

Stakeholder Engagement Summary

The purpose of the stakeholder engagement process was to capture perspectives from individuals who interact with the tech industry in the Miami Dade MSA including employers, educators, recruiters, training organizations, and job seekers. Engaging stakeholders is significant as it ensures that the knowledge and insights of individuals directly involved in various aspects of the tech industry are incorporated in decision-making processes. By capturing these diverse perspectives through interviews and surveys, a nuanced understanding of stakeholder experiences was obtained which can help Miami Tech Works better understand strengths and challenges across the ecosystem. Stakeholder engagement can also foster ownership and empowerment of initiatives because input comes directly from the source. This approach promotes transparency, trust, and collaboration, creating an environment where stakeholders feel invested in the outcomes and actively contribute to the decision-making process. Details regarding the methods used for the interviews and survey are provided below.

Methodology

Interviews

To gather perspectives of employers, educators, and industry training organizations, the project team attended the FIU Tech Talent Summit and the Venture Miami Tech Hiring Fair. At the FIU summit, several employers and industry experts were brought in to present industry insights to help college students better prepare themselves for the job market, particularly in the tech industry. The Venture Miami Tech Hiring Fair operated like a traditional career fair; however, the event focused specifically on tech careers. The project team attended these events and conducted 15 interviews, each lasting between 15 to 45-minutes. The interviews were designed to better understand employers' perceptions of the tech industry; potential gaps in knowledge, skills, and abilities of job seekers; training gaps; recruiting practices; career paths; and the future of the industry.

Job Seeker Survey

In conjunction with interviews with employers, training providers, and industry partners. The project team created a job seeker survey that was distributed to individuals who attended the 2024 Venture Miami Hiring Fair and Miami Dade College students and graduates. The survey's purpose was to better understand the perceptions of tech job seekers and how they relate to the knowledge, skills, and abilities required to participate in the workforce and discover their perceived proficiency in high demand tech skills that were identified using Lightcast data.^{8 9} The survey was completed by 59 individuals.

Surveys serve as invaluable tools for gathering insights and opinions from a diverse pool of respondents, providing valuable data for research and decision-making processes. They offer a convenient and efficient way to collect information on a wide range of topics, including job preferences, skills, and employment challenges. However, surveys may have limitations such as response bias, sample representativeness, and the inability to capture nuanced responses.

8 The job seeker survey can be found in the appendices section.
9 Job Postings Table. Source: Lightcast Q1 2024 Data Set.

Findings

Key Findings from Stakeholder Interviews

The findings from the stakeholder engagement process can be broken down into several themes: training, recruitment and job placement, and future industry outlook. It is important to note that these findings were elevated because they were mentioned by multiple stakeholders and solving these challenges could present viable solutions to connecting local job seekers with tech jobs, if executed properly.

Training

Many of the questions on training focused on current gaps in local training programs; knowledge, skill, and ability (KSA) gaps in job seekers; and internal training processes for employers. After discussion with regional employers, training providers, and community-based organizations who work in the tech space, several themes related to training of job seekers emerged.

Lack of Job Seeker Experience:

This was elevated as the greatest challenge for employers to bring in local talent. Several individuals point to the oversaturation of job seekers in the tech industry as one of the leading causes, combined with the lack of innovation in training and education programs. Stakeholders mentioned how important it was for tech workers to gain tangible experience in conjunction with theoretical learning to “jump right in and create an impact”. Bootcamps were identified as an opportunity to quickly learn the baseline skills, but some camps would not provide individuals with the tangible experience that translates into the workplace, and they can be expensive, creating a barrier for lower-income residents.

It was recommended that students and job seekers who are early in their career need to be active on tech-centric development sites such as GitHub to showcase their work and gain hands-on experience; work with start-up organizations who need tech support but cannot afford high-level talent; or work on creating something of their own to showcase their abilities. Additionally, several stakeholders mentioned that local students need more instruction on how to successfully complete the technical interview processes required by employers to compete with students from out of the region.

Disjointed Professional Development Opportunities:

Stakeholders reported that between online and in-person upskilling learning platforms, bootcamps, higher education, there was no shortage of opportunities for an individual to learn the skills they would need to be successful in a tech career. Furthermore, there was no mention that there were gaps in programs that provided technical expertise or training on programming languages. However, individuals program participants and individuals who support them in finding educational opportunities reported that the volume of programs and lack of cohesion among them created confusion on the best path forward, and ultimately made some individuals less inclined to pursue opportunities.

Gaps in Continued Learning and Career Progression:

Several companies expressed difficulty in moving mid-level managers into senior-level roles and that they find skills gaps at this point in the workforce as opposed to entry level candidates. They pointed to a lack of soft skills and leadership experience and capability, combined with the subject matter expertise. As a result, the region faces challenges in promoting individuals from middle-level to senior roles, necessitating the hiring of external talent. It is possible that this influx of new talent disrupts the progression pipeline, hindering the availability of entry-level positions and stalling overall career advancement within the local workforce.

When asked about their internal training processes, companies provided mixed results. As expected, several larger companies mentioned robust internal talent development programs that tracked progress for employees and provided a cultivated learning experience based on career goals. Other companies, which tended to be small-to mid-sized companies, albeit not exclusively, mentioned that they did not have any structured internal development program or process.

Other:

Other gaps mentioned from stakeholders that were mentioned but significantly present across stakeholder reports include

- Shortcomings in the mathematic skills of US job seekers
- Employers have low training budgets to upskill employees and lack an understanding of the workforce development system. One employer expressed how helpful it would be to have access to funding to train employees.
- Lack of need on behalf of employers because they have the ability to import talent.

Job Placement

Challenges with Career Services:

Part of helping job seekers and young people gain industry experience is having effective career services for them. Stakeholders mentioned two major challenges with the career services ecosystem across South Florida. First, young job seekers are unfamiliar with how career services can support them on their journey and these services are often underutilized. Stakeholders mentioned that it is important that students take initiative in connecting with these services, but service providers and their partners can do a better job of connecting with students.

Furthermore, career services offices have not updated their line of services to the modern job seeker and the needs of employer. Many career service offices are focused on connecting students with internship opportunities. However, internships are not viable for all students because they are often unpaid. This makes them less accessible to students who are supporting themselves through college and/or their individual learning experiences. Stakeholders mentioned that career services offices and employers should work together to develop more accessible training opportunities such as micro internships, co-op programs, apprenticeships, and other innovative programs.

Limited Job Placement Pipelines:

Most employers underscored internship and/or rotational programs as their primary way for bringing in talent. As is standard across the industry, most large employers reported they would bring in more interns than they could hire. This increases the competitiveness of their job placement process and helps them identify top talent. Smaller and mid-sized employers did present consistent methods for job placement. Some of them used internship opportunities, whereas others would bring individuals in as traditional employees.

Employers did not appear to be leveraging apprenticeship programs or other work-based learning efforts other than internships. In a conversation with a training provider, the representative mentioned that they have an apprenticeship program; however, employers seem reluctant to sponsor it because they have not traditionally done so in the past.

'Importing' or Offshoring Talent:

Several employers mentioned that based on their research, there does not appear to be a gap in talent as the tech workforce reflects an unemployment rate of 1%, although many of those employees may not be in their desired roles. With that in mind, companies are looking to fill their talent needs by offshoring talent to other countries who can perform the same service for a lower price. Other companies have resorted to meeting their talent demands by recruiting job seekers that do not already reside in the Miami region.

Future Industry Outlook

Address Lack of Collaborative Efforts:

Several stakeholders underscored the need to improve collaborative efforts and that both employers and educational/training organizations could improve their efforts by dedicating more time and resources to creating more effective partnerships. Particularly, it is important that employers make an effort to be more proximal to students, and educators and educational/training institutions should spend more time working with employers to identify creative and innovative strategies for helping students gain experience prior to entering the workforce. One specific example that was mentioned was more collaboration with regional bootcamps and educational institutions should work together to understand how they can work to support one another and strategically align efforts as opposed to operating separately. Employers can fit into this effort by supporting self-discovery and career exploration efforts.

AI Priority:

Most stakeholders underscored the significance of recent AI developments in the tech industry. They mentioned that it is important that all training programs test or incorporate AI abilities in their curricula. Individuals reported that they believe programs were taking proper steps to equip job seekers with adequate skills as it relates to AI. However, employers were mixed on how or if AI will automate certain jobs rendering them obsolete. Some employers mentioned that they could envision jobs such as customer service, customer experience, software engineers, and UX and UI designers will be automated; others mentioned that they did not believe jobs would become fully automated, but it would be important for workers to know how to use AI tools to increase their overall productivity and respond to rising demands.

High Cost of Living:

Several employers mentioned how difficult it was to accommodate entry level employees due to the high cost of living. Several employers, small employers in particular, mentioned that they had a difficult time offering a competitive salary for entry-level employees. Other employers discussed how the high cost of living makes it difficult for young individuals to live in the area, thus they have been leveraging remote workers from other states and other counties where they can offer more competitive salaries associated with the cost of living for those areas.

Key Findings from Job Seeker Survey

Demographically speaking, most survey completers (53) were actively seeking a tech-related job, whereas 5 respondents said they were not seeking a job and 2 said they might be. The experience of respondents was limited with 83% of respondents saying they had less than two years of experience. When looking at the age demographics, 36% of respondents were between the ages of 25 and 24, 24% of respondents were 18 to 24 years old, and the same percentage was representative of populations aged 25 to 44. Reflective of individuals reporting a lack of industry experience, most respondents (54%) reported that they were a current student or recent graduate, 27% stated they graduated more than 5 years ago, and the remainder did not attend school (13%) or skipped the question (.05%).

During the survey, respondents were asked to report their perceived level of proficiency across various high demand soft skills, hard skills, and programming languages. Overall, respondents viewed themselves as more proficient in soft skills than hard skills. Related to soft skills, nearly all respondents rated themselves as average proficiency or higher across all soft skills. While *Management* was the lowest rated soft skill, respondents expressed higher levels of confidence in management, than the highest rated hard skill, writing. This finding is important because based on employer interviews, a common theme was that they had a hard time finding individuals with technical skills and leadership and management experience.

SOFT SKILL AND HARD SKILL RANKINGS: TABLE 3¹⁰

| Soft Skill | Rating |
|-------------------------------------|--------|
| CUSTOMER SERVICE | 190 |
| PROBLEM SOLVING AND TROUBLESHOOTING | 185 |
| SELF MOTIVATION | 185 |
| WRITTEN COMMUNICATION | 178 |
| LEADERSHIP | 176 |
| ATTENTION TO DETAIL | 176 |
| VERBAL COMMUNICATION | 175 |
| PRESENTING | 169 |
| PLANNING | 165 |
| MANAGEMENT | 163 |

¹⁰ For the subsequent two tables, respondents were asked to rate themselves on a scale of 1 to 5, 1 being low, 5 being high. From there, the number of responses were multiplied by the overall "value" of the respondent rating. For each skill the total ratings were summed to create these rankings.

| Hard Skill | Rating |
|---|--------|
| WRITING | 155 |
| MICROSOFT OFFICE | 150 |
| COMPUTER SCIENCE | 140 |
| OPERATIONS | 135 |
| PROJECT MANAGEMENT (AGILE METHODOLOGY, WATERFALL, ETC.) | 133 |
| INFORMATION TECHNOLOGY | 126 |
| HTML/CSS | 119 |
| DATA ANALYSIS | 118 |
| SOFTWARE ENGINEERING / DEVELOPMENT | 112 |
| APPLICATION PROGRAMMING INTERFACE (API) (BUILDING OR INTEGRATING) | 107 |
| AMAZON WEB SERVICES | 80 |
| MICROSOFT AZURE | 77 |

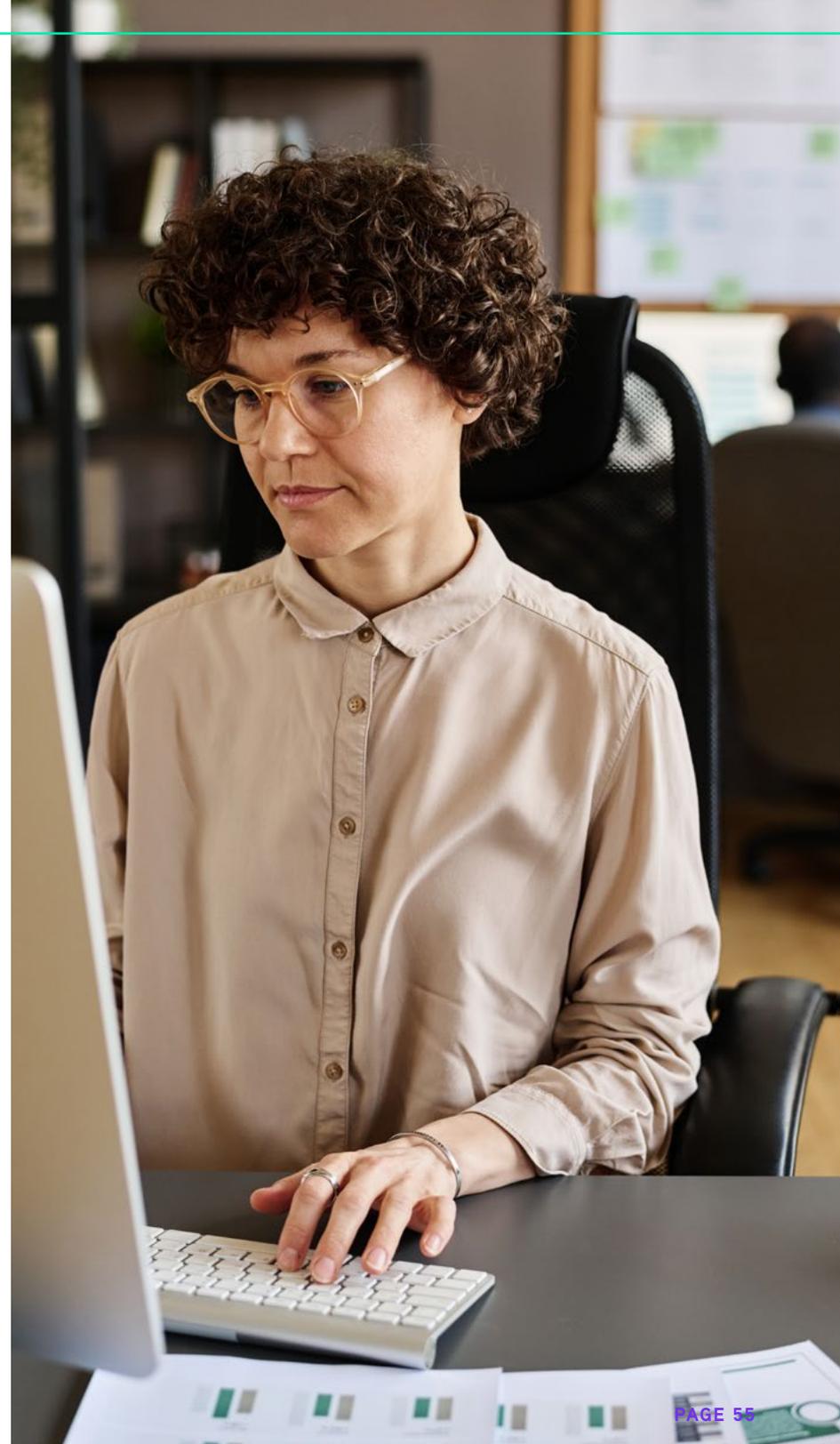
When asked about programming languages, respondents were asked to select all programming languages that they felt proficient in. Most respondents reported that they were proficient in SQL (21), JavaScript (22), and Python (21). Beyond that, there were no other statistically significant programming languages that individuals felt proficient in. It is worth noting that 17 respondents opted not to answer this question. In a related question, individuals were asked to select all of the skills they would like to use in their next job to develop a better understanding of their career goals and aspirations. The highest rated skill was web development (23), artificial intelligence or machine learning (22), software development (19), data analytics (19), mobile app development (16), information technology (14), and user experience and user interface design (13). Skills with the lowest responses include quantum computing (2), biotechnology and bioinformatics (3), digital marketing and search engine optimization (4), telecommunications (4), robotics and automation (4), and blockchain technology (5).

Another segment of questions asked respondents about what they are looking for in employers and barriers they have been facing to employment. The most important qualities of companies' respondents voted for were companies that pay a living wage (23), have clear advancement opportunities (18), offers remote work opportunities (18), and the schedules meet the needs and demands of the job seeker's life (14). Lower priorities were consistent, advanced notice of schedules (3), companies providing work materials (4), and number of hours individuals are expected to work are clearly outlined (4).

When asked about the degree to which the following barriers have prevented individuals from finding employment, difficulty getting hired, affordability of housing, and transportation barriers were the top three challenges. Respondents were then asked to select all programs and services that they thought would help them in their job search. Most methods received high scores, but the highest were connections to apprenticeship programs (21), networking support (20), resume building and preparation (18), and job search assistance (18).

| Complication | Rating |
|--|--------|
| DIFFICULTY GETTING HIRED | 103 |
| ACCESS TO AFFORDABLE HOUSING | 73 |
| TRANSPORTATION BARRIERS | 61 |
| MENTAL HEALTH CHALLENGES | 61 |
| UNWILLINGNESS TO RETURN TO WORK BECAUSE YOU ARE LOOKING FOR SOMETHING NEW OR DIFFERENT | 55 |
| CONCERNS RELATED TO COVID-19 | 51 |
| OTHER PHYSICAL HEALTH CHALLENGES | 47 |
| SCHOOL CLOSURES AND/OR LACK OF CHILDCARE | 43 |

The survey concluded with two open ended questions about perceived assets across the community and recommended questions for future research. Several assets that were mentioned by several stakeholders were the number of resources that exist across the community (GrammerHub and Latinas in Tech were mentioned as two helpful support organizations), open-mindedness individuals working in the tech ecosystem, the demand for tech work in Miami, and opportunities to learn. Future recommended questions include being more specific about websites and employers job seekers have tried to connect with, transitioning into the tech sector if that was not and individual's primary field of study, experience working with recruits, and the number of jobs job seekers applied to versus how many interviews they received.





Miami Tech Works

Recommendations

Recommendations

Recommendation Themes

Build pathways into tech ecosystem for local job seekers

Many tech employers rely heavily on a uniform process of securing talent through internship programs. Students apply for these internship opportunities, and upon completion, select interns are offered full-time roles while others are left to explore alternative employment options. This one-size-fits-all approach creates barriers for individuals from underrepresented communities who may lack the resources or familiarity with the internship process. Moreover, it can overlook the potential benefits of hiring local job seekers instead of continually 'importing' talent from elsewhere. To better serve the diverse job seeker population of the greater Miami area, it is crucial that higher educational institutions, workforce development organizations, nonprofit groups, and businesses collaborate to explore alternative talent development pathways. These could include apprenticeships, coding bootcamps, micro-internships, and other hands-on learning opportunities that provide more accessible entry points for local candidates. By diversifying the talent pipeline beyond the traditional internship model, the tech sector can tap into the rich talent pool within Miami's communities while offering equitable access to rewarding career prospects.

Support the tech industry sector partnership

Industry sector partnerships have demonstrated their immense value as catalysts for economic vitality and job growth. Through collaborative efforts, these partnerships can drive workforce development initiatives that cultivate a talent pipeline aligned with industry demands and facilitate invaluable networking opportunities and resource sharing that enable businesses to leverage collective expertise and maximize efficiencies. While pockets of collaborative efforts have emerged, it is evident that there is still work to do. Robust employer engagement and leadership within these partnerships is paramount to ensuring their success and sustainability. The active participation, insights, and commitment of employers are vital to shaping initiatives that directly address the pressing workforce needs and strategic objectives of their respective industries. By stepping up and driving these collaborative efforts, employers can play a pivotal role in cultivating a competitive economic landscape that fosters innovation, attracts investment, and generates high-quality job opportunities for years to come.

Enhance and connect local training efforts

The organizations and institutions working to support residents in their tech careers were applauded for their effort and passion. However, it became clear that more collaboration is needed to better support local job seekers as they gain the necessary skills to meet the needs of employers. Example ideas that were discussed with stakeholders include using bootcamp training programs to support pre-requisite learning and individuals who have recently graduated but lack technical expertise of coding languages; facilitating better connections with the K-12 education systems and preparing students for tech careers earlier in their developmental process; leveraging work-based learning opportunities such as micro-internships, job shadowing, pre-apprenticeship programs, apprenticeship programs, and internships; and better preparing students for the technical interview process by mandating technical interview classes as for-credit courses.

Generate employer buy-in and support

While some employers grasp the importance of collaborating with local education and training providers to tap into the local talent pool, the number actively engaged in these efforts falls short of what is necessary to adequately support the local workforce, especially for entry-level workers and recent graduates. A slight disconnect persists between the skills being cultivated locally and the needs of certain employers. Consequently, graduates are compelled to leave the area in pursuit of careers, switch industries, or remain unemployed, while companies are forced to look beyond state borders and even overseas to fulfill their talent requirements. By garnering broader employer buy-in and commitment, education and workforce development organizations can better align their programs with the specific needs of local businesses. This relationship would serve the dual purpose of equipping job seekers with the precise skills demanded by area employers while simultaneously providing companies with a talent pipeline tailored to their unique requirements. Fostering a culture of collaboration between employers and training providers is integral to bridging this gap and ensuring that the local workforce possesses the relevant competencies to meet industry demands. By strengthening these partnerships, both entities can achieve their objectives – empowering local job seekers with viable career pathways while furnishing businesses with the skilled talent they need to thrive.

Suggested Strategies for Organizations

Employers

Create or enhance internal training processes and methodology.

Based on employer sentiment, the region struggles to advance employees from middle-level to senior roles, leading to the necessity of hiring talent from outside the area. This external hiring may be creating a bottleneck in the talent progression pipeline, limiting the availability of entry-level positions and impeding career growth for the local workforce. Through the support of higher education, local government, and workforce training providers, employers need to develop and maintain robust employee training programs. While many large employers mentioned their own internal training processes, several small to mid-sized employers did not echo this sentiment. They mentioned that to progress in their careers, employees were delegated more responsibility, or individuals were brought in from outside of the Miami area to fill roles. Internal career pathways can be supported through work-based learning opportunities, apprenticeship programs, and working with the public workforce system and higher education systems to support incumbent worker training. Furthermore, employers can work with the public workforce system to receive funding for incumbent worker training. Permissible costs included tuition costs, curriculum development, textbooks and manuals, and other costs for training materials.¹¹

The Career Pathways section of this document provides two potential career pathways that employers can use to examine the knowledge, skills, and abilities needed to help current employees progress throughout their careers. Effective internal training processes should equip employees with professional development opportunities that help employees build upon their knowledge base and connect them with programs and experiences that build these skillsets. Utilizing stackable credentials is an effective way of doing this. Stackable credentials are a sequence of credentials that can be built overtime to help individuals build their qualifications to move up a career pathway. Credentials can include industry certifications, certificate programs, colleges degrees, and employer sponsored training.¹² Smaller and mid-size employers who have limited resources, should leverage partnerships with colleges and the public workforce development system to learn more about how programs or group sponsored programs can be leveraged to support their training needs.

11 Florida Incumbent Worker Training Program Guidelines: https://careersourceflorida.com/wp-content/uploads/2018/06/Incumbent_Worker_Training_Guidelines.pdf

12 Miami Dade College - Understanding Your Credentials: <https://www.mdc.edu/credentials/>

Offer short-term “micro-internship” opportunities to create more hands-on learning options for students.

Micro-internships have become popular methods for employers to outsource projects that internal staff might not have the capacity or expertise to complete, and provide accessible, hands-on experience for new talent. When asked about the utilization of micro-internships in the Miami area, individuals mentioned that they were aware of them, but did not believe these opportunities were leveraged to the extent they should be.

Parker-Dewey, a long-standing champion of micro-internships and other professional development innovations, provides ample insights on the benefits these programs can have on both employers and job seekers. On top of that, they provide a project library where employers can post and market microinternship opportunities. Current project listings include web development, emerging trends in cybersecurity, software testing, APIs, UX testing, and other custom projects.¹³ To create and manage a meaningful microinternship program, it is important that proper systems are put into place to help such as training supervisors, management software programs, work plans, and clear instructions about the project. Education providers should work with employers to off-load the administrative burden of supporting these programs if they are utilized.

Execute more intentional engagement with training providers and higher education.

Several employers underscored how their relationship with local educational institutions and training providers are imperative in helping them find local talent. In addition to that, they mentioned how this relationship opens the lines of communication among the groups, which creates feedback loops so the education and training providers can better meet the needs of employers. Maintaining and nourishing these relationships will be imperative in maintaining the local ecosystem.

It is clear that employers primarily maintain their relationships with educational providers to help fill their hiring needs. However, there are several other benefits to employers investing time and energy into these efforts including increasing the skills of their current employees, improving employee retention efforts, sharing facilities for programmatic needs, supporting the regional industry sector, and supporting research and development opportunities.¹⁴

13 Parker-Dewey – Microinternship Projects in IT and Cybersecurity: <https://www.parkerdewey.com/projects/it-cyber>

14 Employer Perspectives on Building Partnerships with Community Colleges - Insights for Local Leaders and Practitioners: https://www.dol.gov/sites/dolgov/files/OASP/evaluation/pdf/ETA_EmployerPerspectivesStudy_Brief_Sep2020.pdf

Higher Education

Focus education programs on developing more workforce skills.

Several employers noted that while recent graduates and entry-level workers have their college degrees, they lacked tangible skills needed to succeed in the workplace. Many of these employers attributed this to a lack of experience in the field. Higher education institutions were applauded for their ability to develop critical thinking skills in students, but they should direct more resources to providing workforce skills that translate from the classroom to the field such as project management, leadership, coding language expertise, writing, and workplace etiquette.

With the development of alternative learning platforms like Udemy and corporate training organizations, the role of higher education in the workforce ecosystem has been called into question. To serve the future workforce, higher education institutions are being challenged to direct more of an emphasis on tangible workforce skills. Potential approaches that can be leveraged include working with employers and consultants to create more skill-based courses, create courses that lead to industry certifications, provide means to create a student transcript that captures underlying achieved skills and competencies, create policies that support skill-based credentials.¹⁵

Create stronger systems that encourage and/or require students to develop hands-on experience prior to graduation.

Employers emphasized the importance of students having hands on experience prior to graduation. Thus, it is important for students to complete internships, practicums, capstone projects, etc. to develop experience. However, not all students have the means to complete internships as they may be working jobs to pay their way through school, support family members, and others. Therefore, higher education entities should develop effective systems for connecting students with experiential learning opportunities.

This effort will require collaboration among career services offices, the public workforce development system, and employers. Since the demand for tech workers spans numerous industries, small employers or organizations outside the “tech industry” should also be considered for these work-based learning experiences. Higher education institutions can support microinternship programs and other opportunities by partnering with these organizations and creating courses that complement the work-based learning options and pathways into careers. Educational institutions should create programs that leverage stacking credentials mentioned in the employer section recommendations above.

15 Inside Higher Ed – Evolving the Learning and Employment Ecosystem: <https://www.insidehighered.com/opinion/blogs/beyond-transfer/2023/11/27/5-ways-college-and-universities-support-skills-based>

Leverage and utilize higher education alumni networks.

It is likely that regional colleges and universities are already exploring best practices and avenues for engaging their alumni networks. However, one opportunity for growth would be enhancing their networks through partnerships with regional employers. Several employer representatives mentioned how they were elated to come back to their colleges and maintain a relationship with students and the departments in which they receive their degree, but there was a sentiment that they wished there were more opportunities to connect with the college. This relationship can serve as an added benefit for colleges and universities as the partnership with employers can create recruitment opportunities for continued education as several employers underscored a gap in workers who have both technical experience, and leadership and managerial experience.

American Councils for International Education provides a roadmap for building impactful alumni networks. Three foundational pieces include dedicating program funding, mandating that the program exists and operates within the space of the college, and hiring dedicated staff to administer the alumni network. While these basic factors are keys to running a program, successful programs tend to demonstrate incentives for alumni participation from exclusive access to events to professional development programs; grouping alumni by professional themes, in this case, tech workers; ensuring diversity in alumni network membership; identifying leaders in the alumni community; and establishing a communication platform and alumni database.¹⁶

Develop collaborations with more bootcamp programs.

Stakeholders mentioned that there are numerous short-term training opportunities or bootcamps that exist across the area and that some of them were struggling to connect with employers and job seekers. It was recommended that bootcamps work more closely with higher education institutions to 1. avoid duplication of services across the community; 2. share resources to serve wider audiences; and 3. provide more options for job seekers. Furthermore, bootcamps should be utilized to enhance the tech training ecosystem by supporting individuals early in their careers or looking to transition into the tech-workforce and upskilling/re-skilling individuals currently in tech-related jobs to help them progress in their careers.

The New York State Department of Labor has partnered with Coursera to provide job seekers with free access to nearly 4,000 online training programs. These programs teach skills which are important to employers in high-growth industries, such as data science, business, and technology. Estimated industry demand for skilled workers informs the course offerings, and many of the courses lead to professional certificates. These programs can provide local talent with quick, accessible options for building their skillsets and increasing their competitiveness in the job market.¹⁷

16 American Councils for International Education – Creating and Sustaining Collaborative Alumni Networks: <https://www.americancouncils.org/sites/default/files/2023-01/Creating%20and%20Sustaining%20Collaborative%20Alumni%20Networks.pdf>

17 New York State Department of Labor – Online Learning with Coursera: <https://dol.ny.gov/online-learning-coursera>

Local and Regional Government

Allocate resources and funding to support the development of IT workforce training programs.

Perhaps the greatest role local government can play in connecting local workers to jobs is by providing resources and funding to programs and initiatives that equip local workers with the knowledge and skills needed to support local employers. Local government is also well-positioned to serve as a convener of employers, higher education, training providers, and other stakeholders to strengthen coordinated efforts.

In the mid-2000s, Robeson County, NC the Center for Community Action (CCA) took leadership of workforce coordination efforts. The new efforts gathered regional government, businesses, education providers, and nonprofit organizations to discover innovative solutions to workforce development. These groups partnered to build career pathways, and systems around these career pathways, to connect job seekers to gainful employment. Most importantly, these career pathways were not developed in silos, but through the feedback gathered from employers. Local government can spur the convening of these efforts and catalyze progress. Additionally, in Rhode Island, the Computer Science for Rhode Island (CS4RI) program was launched in 2016. The initiative was created through a partnership between the Rhode Island state government, the Department of Education, K-12 schools, private industry, and nonprofits throughout the state. The program outlined a 5-year strategy for increasing the computer science skillset of its population and provides computer science training for students starting in kindergarten. Career and Technical Education (CTE) pathways are built out for high school students to develop the technical skillsets required for high-paying jobs after high school. This long-term training program helps to make the transition into the workforce or more advanced coursework easier for graduating students.¹⁸ These two examples reflect the role government can play in support talent development efforts.

Create effective and well-managed incentive programs for employers to hire local talent.

The city and county government should work together to create local hiring incentive programs by leveraging federal sources, county fees, public and private bonds, grant programs, and more. These programs should be created and deployed using best practices that not only support employers, but also encourage equitable hiring practices. It is important that local and regional government implement an attentive and scrupulous monitoring system to ensure companies who receive benefits from these incentive programs are serving the interests of local talent.

A “Local and Targeted Hiring” program could help encourage employers to hire local job seekers, or even members of specific groups within the local community. Through these programs, employers are incentivized with public funds to hire (and in some cases train) local job seekers, instead of outsourcing their workforce from outside of the region. Policy Link provides guidance and resources for public entities interested in incentivizing local or targeted hiring.¹⁹

18 Computer Science for Rhode Island (CS4RI): <https://www.cs4ri.org/>

19 Policy Link – Local and Targeted Hiring: <https://www.policylink.org/sites/default/files/Local-and-Targeted-Hiring.pdf>

Workforce Training Providers

Work with employers and education institutions to develop a more robust apprenticeship and pre-apprenticeship programs.

Through various conversations, it became clear the apprenticeship system was not heavily used by employers. When asked about their perspectives on apprenticeship programs, many employers mentioned that they did not quite understand apprenticeships and the benefits they can provide employers. Furthermore, they mentioned that they foresee challenges getting large employers to adopt this method because they had no shortage of applicants. Nevertheless, apprenticeship and pre-apprenticeship programs can be a strong tool for connecting local job seekers, especially young residents (high school students and recent high school graduates), to lucrative and meaningful career opportunities.²⁰

For several reasons, tech employers appear to be resistant to engaging with the registered apprenticeship system. In 2022, Urban concluded a report outlining key findings to facilitating the development of tech apprenticeship programs. Though they are not common, creating direct incentives for employers helped facilitate new programs by offsetting program startup costs. Additionally, employers are more likely to participate in an apprenticeship program when the registration process is streamlined, and technical assistance is provided by workforce development organizations. Last, awareness of apprenticeship programs in the tech sector is low. It is important that workforce development organizations effectively highlight the key benefits of these programs and how they can impact employers, their workers, and their communities.²¹

Expand efforts to connect with K-12 students to STEM and computer science education.

Throughout conversations with employers and other individuals involved in the tech ecosystem, there was no mention of involvement with the K-12 system and connecting these students with tech learning opportunities. Knowing that tech jobs are here to stay, workforce training providers can connect with the K-12 system and help facilitate pre-apprenticeship programs, job shadowing, externships, and other work-based learning programs, to facilitate learning early on to better prepare local job seekers for careers in technology.

Located on the west side of Indianapolis, Ben Davis High School has been recognized by the Indiana Department of Education as a STEM-certified school for more than a decade. This highly nontraditional program allows high school juniors and seniors (from 11 surrounding high schools) to spend half of every school day in career preparation classes, which provide hands-on training in a variety of STEM fields (such as computer science, cybersecurity, integrated mechanics, and many more). Many of the course credits can be transferred to local colleges upon completion, but perhaps more importantly, the programs give students valuable working experience which can be leveraged in the job market immediately after high school. This program helps ensure students are connected with employers and have the skills to succeed by the time they're ready to enter the workforce, and as a result, both employers and young workers benefit.²²

²⁰ Through the job seeker survey, "Connection to apprenticeship program" was the top voted the top service or program that they would find helpful in their job search, demonstrating an appetite from local job seekers.

²¹ Urban – What Works in Tech Apprenticeship: <https://www.urban.org/sites/default/files/2022-06/What%20Works%20in%20Tech%20Apprenticeship.pdf>

Fully engage the public workforce system in tech industry sector partnership efforts.

Miami Tech Works currently serves as an organization that serves local job seekers and connects them to training opportunities, job placement services, and wrap around support to help individuals maintain employment. Through conversations, it was clear that employers were not fully aware of how to access the public workforce system and the benefits it can provide. Miami Tech Works, and other workforce development partners such as CareerSource South Florida, should collaborate to identify effective methods and strategies to connect employers to public workforce resources such as incumbent worker training programs and leverage resources from education providers and short-term training opportunities.

Industry partnerships are challenging to build due to the level of coordination and cooperation required by partners. Similar to Miami Tech Works, the Ohio Manufacturers' Association (OMA) launched industry sector partnerships to strengthen workforce alignment. OMA has proven to be a successful model because it is focused on a single industry, it is broken out to hubs and focuses on the needs of regional economies, the Association serves as a neutral intermediary that aligns relevant partnerships, and most importantly, the sector partnerships are employer led to ensure the system is truly demand driven.²³ Throughout this project, several employers have expressed interest in continuing conversations to enhance tech training across the area. These employers should be identified as champions of the sector partnership and work to corroborate on future efforts.

Other Considerations

Focus on local training for high wage occupations.

Labor market information shows that Professional, Scientific, and Technical Services are the fastest growing industry across Miami-Dade County. Further data shows that the highest earning occupations include Computer and Information Systems Managers, Architectural and Engineering Managers, Computer and Information Research Scientists, Computer Hardware Engineers, Sales Managers, Data Scientists, and Computer Information Analysts as some of the highest paying tech occupations, all reflecting median annual earnings of greater than \$100,000.00. Because resources are limited it is important that workforce development agencies, higher education, and other groups prioritize developing pathways through training programs, apprenticeship programs, and other methods to connect local job seekers to these high paying occupations.

Create buy-in from employers to hire local talent.

Empowering local workers at every stage of their career journey is crucial for fostering a thriving community. While some employers have faced criticism for neglecting their surrounding communities, others have pledged support for local job seekers without effectively following through. To truly uplift the local workforce, employers must redouble their efforts, recognizing that success hinges on collaboration with partners across the tech ecosystem. By collectively investing in the development of local talent and fostering strong partnerships, Miami workers will flourish, and employers have access to the skilled workforce they need and generate regional economic development benefits.

Address challenges related to affordability and the cost of living.

There is no one approach to fix this barrier and this effort will require support from local, regional, and state government officials and entities, plus support from local businesses and the nonprofit community. Nevertheless, several stakeholders alluded to an affordability issue in the region. To create a financially sustainable and thriving local economy, it is important that individuals from all backgrounds are able to participate in the economy and have access to jobs and afford to continue living in the community.

23 Central Ohio Manufacturing Partnership – Industry Sector Partnerships and the Central Ohio Manufacturing Partnership: https://www.centralohiomanufacturingpartnership.org/aws/COMP/asset_manager/get_file/838686?ver=0#:~:text=The%20success%20of%20the%20manufacturing,and%20well%20into%20the%20future



Miami Tech Works

Appendices

Appendices

Appendix 1: Tech Job Seeker Survey Results

ARE YOU CURRENTLY SEEKING A TECH OR TECH-RELATED JOB?

| Answer | Count |
|---------|-------|
| Yes | 53 |
| No | 5 |
| Maybe | 2 |
| Skipped | 0 |

WHICH OF THE FOLLOWING DESCRIBES YOUR PREFERRED FIELD(S)? SELECT ALL THAT APPLY.

| Answer | Count |
|---|-------|
| Computer Science | 19 |
| Cybersecurity | 7 |
| Software Development | 30 |
| Information Technology | 16 |
| Data Science, Statistics, and Mathematics | 12 |
| Engineering | 11 |
| Healthcare | 7 |
| Financial Technology (FinTech) | 10 |
| Environment and Sustainability | 6 |
| Library Science/Technology | 5 |
| Design | 9 |
| Other | 8 |
| Skipped | 7 |

HOW MANY YEARS OF EXPERIENCE DO YOU HAVE IN THE TECH INDUSTRY?

| Answer | Count |
|--------------------|-------|
| None | 16 |
| Less than 1 year | 15 |
| 1 to 2 years | 18 |
| 3 to 5 years | 2 |
| 6 to 10 years | 4 |
| More than 10 years | 2 |
| Skipped | 2 |

WHICH BEST DESCRIBES YOUR AGE?

| Answer | Count |
|----------|-------|
| Under 18 | 0 |
| 18-24 | 14 |
| 25-34 | 21 |
| 35-44 | 14 |
| 45-54 | 8 |
| 55+ | 0 |
| Skipped | 3 |

WHAT IS YOUR CURRENT EMPLOYMENT STATUS?

| Answer | Count |
|---|-------|
| Employed, Full Time | 22 |
| Employed, Part Time | 8 |
| Self-Employed | 1 |
| Unemployed, currently looking for a job | 14 |
| Unemployed, not currently looking for a job | 2 |
| Full Time Student | 8 |
| Other | 2 |
| Skipped | 2 |

ARE YOU A STUDENT OR COLLEGE GRADUATE?

| Answer | Count |
|---|-------|
| I am a current student | 20 |
| I am a recent graduate (graduated in the last 5 years, 2019-2024) | 12 |
| I graduated college more than 5 years ago (prior to 2019) | 16 |
| No, I am not a current student or college graduate | 8 |
| Skipped | 3 |

WHICH OF THE FOLLOWING BEST DESCRIBES YOUR AREA OF STUDY?

| Answer | Count |
|---|-------|
| Computer Science/Information Science | 26 |
| Architecture and Planning | 1 |
| Education | 0 |
| Health Professions and Related Programs | 1 |
| Engineering | 5 |
| Life and Natural Science (biology, ecology, psychology, medicine, etc.) | 2 |
| Physical Science (physics, chemistry, geology, etc.) | 0 |
| Mathematics/Statistics | 0 |
| Creative Arts and Design | 4 |
| Business (accounting, management, finance, etc.) | 5 |
| Social Science and Humanities | 0 |
| Agriculture and Food Science | 0 |
| Liberal Arts and Other Education Categories (history, English, philosophy, political science, etc.) | 4 |
| N/A | 8 |
| Skipped | 3 |

WHAT IS YOUR PREFERRED TYPE OF EMPLOYMENT IN THE TECH INDUSTRY?

| Answer | Count |
|-----------------|-------|
| Full Time | 48 |
| Part Time | 1 |
| Contract | 1 |
| Self-Employment | 2 |

RATE YOUR LEVEL OF PROFICIENCY IN THE FOLLOWING SOFT SKILLS ON A SCALE OF 1-5 (1 BEING THE LOWEST AND 5 BEING THE HIGHEST).

Management

| | |
|---|----|
| 1 – Not at all proficient | 4 |
| 2 – Low level of proficiency – little experience | 2 |
| 3 – Average proficiency – some experience | 9 |
| 4 – Moderately high proficiency – good experience | 17 |
| 5 – Highly proficient – extensive experience | 12 |

Problem Solving and Troubleshooting

| | |
|---|----|
| 1 – Not at all proficient | 1 |
| 2 – Low level of proficiency – little experience | 1 |
| 3 – Average proficiency – some experience | 3 |
| 4 – Moderately high proficiency – good experience | 17 |
| 5 – Highly proficient – extensive experience | 21 |

Customer Services

| | |
|---|----|
| 1 – Not at all proficient | 0 |
| 2 – Low level of proficiency – little experience | 1 |
| 3 – Average proficiency – some experience | 5 |
| 4 – Moderately high proficiency – good experience | 7 |
| 5 – Highly proficient – extensive experience | 29 |

Leadership

| | |
|---|----|
| 1 – Not at all proficient | 0 |
| 2 – Low level of proficiency – little experience | 0 |
| 3 – Average proficiency – some experience | 11 |
| 4 – Moderately high proficiency – good experience | 12 |
| 5 – Highly proficient – extensive experience | 19 |

Attention to Detail

| | |
|---|----|
| 1 – Not at all proficient | 0 |
| 2 – Low level of proficiency – little experience | 2 |
| 3 – Average proficiency – some experience | 3 |
| 4 – Moderately high proficiency – good experience | 12 |
| 5 – Highly proficient – extensive experience | 23 |

Planning

| | |
|---|----|
| 1 – Not at all proficient | 0 |
| 2 – Low level of proficiency – little experience | 2 |
| 3 – Average proficiency – some experience | 5 |
| 4 – Moderately high proficiency – good experience | 14 |
| 5 – Highly proficient – extensive experience | 18 |

Self Motivation

| | |
|---|----|
| 1 – Not at all proficient | 0 |
| 2 – Low level of proficiency – little experience | 0 |
| 3 – Average proficiency – some experience | 3 |
| 4 – Moderately high proficiency – good experience | 9 |
| 5 – Highly proficient – extensive experience | 28 |

Written Communication

| | |
|---|----|
| 1 – Not at all proficient | 0 |
| 2 – Low level of proficiency – little experience | 1 |
| 3 – Average proficiency – some experience | 6 |
| 4 – Moderately high proficiency – good experience | 7 |
| 5 – Highly proficient – extensive experience | 26 |

Verbal Communication

| | |
|---|----|
| 1 – Not at all proficient | 0 |
| 2 – Low level of proficiency – little experience | 0 |
| 3 – Average proficiency – some experience | 4 |
| 4 – Moderately high proficiency – good experience | 14 |
| 5 – Highly proficient – extensive experience | 21 |

Presenting

| | |
|---|----|
| 1 – Not at all proficient | 0 |
| 2 – Low level of proficiency – little experience | 0 |
| 3 – Average proficiency – some experience | 7 |
| 4 – Moderately high proficiency – good experience | 17 |
| 5 – Highly proficient – extensive experience | 16 |

RATE YOUR LEVEL OF PROFICIENCY IN THE FOLLOWING *HARD SKILLS* ON A SCALE OF 1-5 (1 BEING THE LOWEST AND 5 BEING THE HIGHEST).

Computer Science

| | |
|---|----|
| 1 – Not at all proficient | 6 |
| 2 – Low level of proficiency – little experience | 3 |
| 3 – Average proficiency – some experience | 18 |
| 4 – Moderately high proficiency – good experience | 11 |
| 5 – Highly proficient – extensive experience | 6 |

Operations

| | |
|---|----|
| 1 – Not at all proficient | 3 |
| 2 – Low level of proficiency – little experience | 7 |
| 3 – Average proficiency – some experience | 17 |
| 4 – Moderately high proficiency – good experience | 8 |
| 5 – Highly proficient – extensive experience | 7 |

Project Management (Agile Methodology, Waterfall, etc.)

| | |
|---|----|
| 1 – Not at all proficient | 2 |
| 2 – Low level of proficiency – little experience | 8 |
| 3 – Average proficiency – some experience | 10 |
| 4 – Moderately high proficiency – good experience | 10 |
| 5 – Highly proficient – extensive experience | 9 |

Writing

| | |
|---|----|
| 1 – Not at all proficient | 0 |
| 2 – Low level of proficiency – little experience | 1 |
| 3 – Average proficiency – some experience | 7 |
| 4 – Moderately high proficiency – good experience | 13 |
| 5 – Highly proficient – extensive experience | 16 |

Information Technology

| | |
|---|----|
| 1 – Not at all proficient | 3 |
| 2 – Low level of proficiency – little experience | 4 |
| 3 – Average proficiency – some experience | 13 |
| 4 – Moderately high proficiency – good experience | 9 |
| 5 – Highly proficient – extensive experience | 8 |

Application Programming Interface (API) (Building OR Integrating)

| | |
|---|----|
| 1 – Not at all proficient | 7 |
| 2 – Low level of proficiency – little experience | 7 |
| 3 – Average proficiency – some experience | 10 |
| 4 – Moderately high proficiency – good experience | 9 |
| 5 – Highly proficient – extensive experience | 4 |

Software Engineering / Development

| | |
|---|----|
| 1 – Not at all proficient | 5 |
| 2 – Low level of proficiency – little experience | 5 |
| 3 – Average proficiency – some experience | 14 |
| 4 – Moderately high proficiency – good experience | 10 |
| 5 – Highly proficient – extensive experience | 3 |

Data Analysis

| | |
|---|----|
| 1 – Not at all proficient | 3 |
| 2 – Low level of proficiency – little experience | 8 |
| 3 – Average proficiency – some experience | 13 |
| 4 – Moderately high proficiency – good experience | 5 |
| 5 – Highly proficient – extensive experience | 8 |

Amazon Web Services

| | |
|---|----|
| 1 – Not at all proficient | 14 |
| 2 – Low level of proficiency – little experience | 10 |
| 3 – Average proficiency – some experience | 8 |
| 4 – Moderately high proficiency – good experience | 3 |
| 5 – Highly proficient – extensive experience | 2 |

Microsoft Azure

| | |
|---|----|
| 1 – Not at all proficient | 17 |
| 2 – Low level of proficiency – little experience | 9 |
| 3 – Average proficiency – some experience | 5 |
| 4 – Moderately high proficiency – good experience | 3 |
| 5 – Highly proficient – extensive experience | 3 |

Microsoft Office

| | |
|---|----|
| 1 – Not at all proficient | 2 |
| 2 – Low level of proficiency – little experience | 2 |
| 3 – Average proficiency – some experience | 3 |
| 4 – Moderately high proficiency – good experience | 15 |
| 5 – Highly proficient – extensive experience | 15 |

HTML/CSS

| | |
|---|----|
| 1 – Not at all proficient | 7 |
| 2 – Low level of proficiency – little experience | 4 |
| 3 – Average proficiency – some experience | 7 |
| 4 – Moderately high proficiency – good experience | 12 |
| 5 – Highly proficient – extensive experience | 7 |

WHICH OF THE FOLLOWING PROGRAMMING LANGUAGES ARE YOU PROFICIENT IN? SELECT ALL THAT APPLY.

| Answer | Count |
|-------------------|-------|
| SQL | 21 |
| JavaScript | 22 |
| Python | 21 |
| Java | 9 |
| C# | 6 |
| C++ | 9 |
| C | 4 |
| R | 5 |
| Go | 1 |
| Ruby | 1 |
| Perl | 0 |
| Scala | 0 |
| Swift | 2 |
| Visual Basic .NET | 4 |
| Objective-C | 1 |
| None of the above | 5 |
| Other | 1 |
| Skipped | 17 |

WHICH OF THE FOLLOWING SKILLS ARE YOU LOOKING TO USE IN YOUR NEXT JOB? SELECT ALL THAT APPLY

| Answer | Count |
|--|-------|
| Information Technology | 14 |
| Software Development | 19 |
| Cybersecurity | 7 |
| Data Science and Analytics | 19 |
| Artificial Intelligence (AI) and Machine Learning | 22 |
| Cloud Computing | 9 |
| Web Development | 23 |
| Mobile App Development | 16 |
| User Experience (UX) and User Interface (UI) Design | 13 |
| Digital Marketing and Search Engine Optimization (SEO) | 4 |
| Gaming and Entertainment Technology | 9 |
| Financial Technology | 7 |
| Health Information Technology | 7 |
| Internet of Things (IoT) and Embedded Systems | 6 |
| Telecommunications | 4 |
| Robotics and Automation | 4 |
| Augmented Reality (AR) and Virtual Reality (VR) | 9 |
| Blockchain Technology | 5 |
| Quantum Computing | 2 |
| Biotechnology and Bioinformatics | 3 |
| Other | 2 |
| Skipped | 17 |

HAVE YOU ENCOUNTERED ANY CHALLENGES OR BARRIERS IN FINDING EMPLOYMENT IN THE TECH INDUSTRY? IF YES, PLEASE SPECIFY

| Answer |
|--|
| Access to free resources, conferences and bootcamps |
| Yes, specifically related to my immigration status |
| Yes, experience |
| Requirements too difficult to meet and too specific. Mismatch between work experience/education and available jobs. Too many candidates. |
| Not landing interviews |

WHICH OF THE FOLLOWING SERVICES/PROGRAMS WOULD YOU FIND THE MOST HELPFUL IN YOUR JOB SEARCH? (SELECT ALL THAT APPLY)

| Answer | Count |
|---|-------|
| Assessments for skills, interests, and/or supportive services | 17 |
| Access to partner programs or services | 15 |
| Resume building and preparation | 18 |
| Learning activities (tutorials and videos) to provide instruction on key topics such as interviewing, job search skills, soft skills, etc.) | 15 |
| Job search assistance | 18 |
| Financial assistance to pursue training opportunities | 9 |
| Financial literacy programs | 5 |
| Career exploration services | 13 |
| Connection to apprenticeship programs | 21 |
| Networking support | 20 |
| Other | 2 |
| Skipped | 27 |

WHICH OF THE FOLLOWING ARE MOST IMPORTANT TO YOU WHEN CONSIDERING A JOB OPPORTUNITY? SELECT YOUR TOP 4 PRIORITIES

| Answer | Count |
|---|-------|
| The company pays a living wage | 23 |
| The schedule meets your needs and matches the demands of your life | 14 |
| The number of hours you will be expected to work is clearly outlined | 4 |
| That you are given consistent, advanced notice of your schedule | 3 |
| That you are provided with medical and dental benefits | 10 |
| That there are clear career advancement opportunities | 18 |
| That the company's mission aligns with your own personal values | 12 |
| The company offers remote work opportunities | 18 |
| That you have a say on the job once you are hired and your input is valued | 5 |
| The company is willing to provide you with work materials (laptop, mouse, etc.) | 4 |
| That you are offered adequate paid time off (PTO) and sick leave | 10 |

TO WHAT DEGREE HAVE THE FOLLOWING IMPACTED YOUR ABILITY TO WORK IN THE LAST TWO YEARS?

School closures and/or lack of childcare

| | |
|-----------------------------|----|
| 1 – Not at all impacted me | 23 |
| 2 – Minorly impacted me | 4 |
| 3 – Moderately impacted me | 4 |
| 4 – Highly impacted me | 0 |
| 5 – Very highly impacted me | 0 |

Transportation barriers

| | |
|-----------------------------|----|
| 1 – Not at all impacted me | 17 |
| 2 – Minorly impacted me | 1 |
| 3 – Moderately impacted me | 8 |
| 4 – Highly impacted me | 2 |
| 5 – Very highly impacted me | 2 |

Access to affordable housing

| | |
|-----------------------------|----|
| 1 – Not at all impacted me | 12 |
| 2 – Minorly impacted me | 5 |
| 3 – Moderately impacted me | 6 |
| 4 – Highly impacted me | 2 |
| 5 – Very highly impacted me | 5 |

Mental health challenges

| | |
|-----------------------------|----|
| 1 – Not at all impacted me | 18 |
| 2 – Minorly impacted me | 2 |
| 3 – Moderately impacted me | 6 |
| 4 – Highly impacted me | 4 |
| 5 – Very highly impacted me | 1 |

Concerns related to Covid-19

| | |
|-----------------------------|----|
| 1 – Not at all impacted me | 18 |
| 2 – Minorly impacted me | 8 |
| 3 – Moderately impacted me | 3 |
| 4 – Highly impacted me | 2 |
| 5 – Very highly impacted me | 0 |

Other physical health challenges

| | |
|-----------------------------|----|
| 1 – Not at all impacted me | 22 |
| 2 – Minorly impacted me | 2 |
| 3 – Moderately impacted me | 4 |
| 4 – Highly impacted me | 1 |
| 5 – Very highly impacted me | 1 |

Unwillingness to return to work because you are looking for something new or different

| | |
|-----------------------------|----|
| 1 – Not at all impacted me | 17 |
| 2 – Minorly impacted me | 8 |
| 3 – Moderately impacted me | 4 |
| 4 – Highly impacted me | 0 |
| 5 – Very highly impacted me | 2 |

Difficulty getting hired

| | |
|-----------------------------|----|
| 1 – Not at all impacted me | 6 |
| 2 – Minorly impacted me | 1 |
| 3 – Moderately impacted me | 8 |
| 4 – Highly impacted me | 4 |
| 5 – Very highly impacted me | 11 |

WHAT DO YOU PERCEIVE AS THE MAJOR STRENGTHS AND ASSETS OF YOUR COMMUNITY FOR TECH WORKERS?

Answer

To me, the major strengths and assets of my community for tech workers is the environment in which they develop, including new job opportunities whenever they are advancing in a specific area of the field and being able to have new business opportunities in other parts of the world

Online sources

More apprenticeship work in specific fields. The school to employment gap has to be filled

Strong collaboration between ots members

The comradery

Resources

There's a lot of opportunities to learn and up your skills.

Unfortunately, I have yet to see many strengths within the community. There is a lack of communication and willingness to go beyond the bare minimum of "assisting others". If there is a strength, it's that everyone is friendly when they're around, but that's about the extent of it.

Open mindedness and being able to communicate well

Networking

Open community for everybody, everyone is receptive and welcoming, willing to help each other out

We have an incredible variety of events and collaborations between many organizations. Providing great opportunities to meet the leaders and peers in the tech community. A lot of which are open and invested in building the next generation.

Learning

Eagerness to learn; diversity of educational, economic, and cultural backgrounds

The demand for tech work in Miami

Networking. I also don't fully understand this question. Community in relation to where I live? My cultural background?

Tech communities such as GrammerHub and Latinas in Tech

South Florida has low unemployment.

My creativity and diversified interests means I am always interested in learning new information. Additionally, my background in newspaper allows me to feel comfortable with meeting new people in professional settings.

Miami is strategically located and if it is going to be a tech hub, it should help the city's residents first.

Networking

Many job and learning opportunities. Many support organizations.

Miami is such an international tech hub with lots of talent and perspectives

Lower wages than the rest of the country.

IF YOU WERE PREVIOUSLY EMPLOYED IN A TECH-RELATED ROLE, WHY DID YOU DEPART FROM THE COMPANY?

| Answer | Count |
|---|-------|
| Resigned due to dissatisfaction with the job | 4 |
| Resigned due to better job opportunity | 0 |
| Resigned due to higher paying job opportunity | 2 |
| Resigned due to extenuating circumstances (illness, family issues, childcare, etc.) | 1 |
| Laid off | 3 |
| Terminated | 0 |
| Other | 10 |
| Skipped | 39 |

HOW WOULD YOU PREFER TO RECEIVE INFORMATION ABOUT LOCAL JOB OPPORTUNITIES AND CAREER SERVICES? SELECT ALL THAT APPLY.

| Answer | Count |
|--|-------|
| Email newsletter | 18 |
| In-person events (career fairs, networking events) | 24 |
| CareerSource South Florida (American Job Center) | 8 |
| Online listings (Indeed, Glassdoor, LinkedIn) | 15 |
| Company website | 11 |
| Social media | 9 |
| Other | 1 |
| Skipped | 29 |

WE GREATLY APPRECIATE YOUR TIME AND EFFORT IN THIS SURVEY, WE RECOGNIZE WE MAY NOT HAVE ALL THE QUESTIONS IMPORTANT TO YOU AND YOUR EXPERIENCE, WHAT SHOULD WE HAVE ASKED YOU TO BETTER UNDERSTAND CHALLENGES THAT JOBSEEKERS FACE IN FINDING AND MAINTAINING EMPLOYMENT IN TECH JOBS?

Answer

Are you having any trouble finding jobs or communicating with potential employers on any of these websites? (then go on to list some of the most common sites).

You've asked all the questions you should have. I would like to know more about ways to transition into the field if it hasn't been your mode of study. (Though many of our instructors changed careers as well).

what my cumulative GPA was.

How to connect with recruiters for tech roles

Time since graduating from formal education with a related degree or bootcamp.

How many jobs they applied to versus how many interviews they received? Common method for applying to jobs?

Appendix 2: Occupations Included in Supply Gap Analysis

| SOC | Description | 2024 Jobs | Median Hourly Earnings | COL Adjusted Median Hourly Earnings | Typical Entry Level Education | Work Experience Required |
|---------|---|-----------|------------------------|-------------------------------------|-------------------------------|--------------------------|
| 11-2022 | Sales Managers | 10,667 | \$59.13 | \$51.82 | Bachelor's degree | Less than 5 years |
| 11-3021 | Computer and Information Systems Managers | 7,669 | \$67.86 | \$59.48 | Bachelor's degree | 5 years or more |
| 11-9041 | Architectural and Engineering Managers | 2,159 | \$63.83 | \$55.94 | Bachelor's degree | 5 years or more |
| 15-1211 | Computer Systems Analysts | 7,783 | \$46.48 | \$40.73 | Bachelor's degree | None |
| 15-1212 | Information Security Analysts | 2,697 | \$52.87 | \$46.33 | Bachelor's degree | Less than 5 years |
| 15-1221 | Computer and Information Research Scientists | 680 | \$60.59 | \$53.10 | Master's degree | None |
| 15-1231 | Computer Network Support Specialists | 3,480 | \$31.69 | \$27.77 | Associate's degree | None |
| 15-1232 | Computer User Support Specialists | 13,285 | \$24.88 | \$21.80 | Some college, no degree | None |
| 15-1241 | Computer Network Architects | 1,956 | \$52.69 | \$46.18 | Bachelor's degree | 5 years or more |
| 15-1242 | Database Administrators | 1,395 | \$49.41 | \$43.30 | Bachelor's degree | None |
| 15-1243 | Database Architects | 624 | \$64.32 | \$56.37 | Bachelor's degree | None |
| 15-1244 | Network and Computer Systems Administrators | 6,247 | \$40.87 | \$35.82 | Bachelor's degree | None |
| 15-1251 | Computer Programmers | 1,759 | \$45.93 | \$40.26 | Bachelor's degree | None |
| 15-1252 | Software Developers | 21,362 | \$51.97 | \$45.55 | Bachelor's degree | None |
| 15-1253 | Software Quality Assurance Analysts and Testers | 2,901 | \$39.99 | \$35.05 | Bachelor's degree | None |
| 15-1254 | Web Developers | 3,132 | \$29.65 | \$25.98 | Bachelor's degree | None |
| 15-1255 | Web and Digital Interface Designers | 2,717 | \$43.34 | \$37.98 | Bachelor's degree | None |
| 15-1299 | Computer Occupations, All Other | 4,911 | \$36.92 | \$32.36 | Bachelor's degree | None |
| 15-2051 | Data Scientists | 3,158 | \$58.26 | \$51.06 | Bachelor's degree | None |
| 17-2061 | Computer Hardware Engineers | 286 | \$60.13 | \$52.70 | Bachelor's degree | None |
| 17-3012 | Electrical and Electronics Drafters | 205 | \$29.02 | \$25.44 | Associate's degree | None |
| 17-3023 | Electrical and Electronic Engineering Technologists and Technicians | 1,236 | \$28.76 | \$25.21 | Associate's degree | None |
| 17-3024 | Electro-Mechanical and Mechatronics Technologists and Technicians | 381 | \$36.98 | \$32.41 | Associate's degree | None |
| 17-3027 | Mechanical Engineering Technologists and Technicians | 343 | \$29.04 | \$25.45 | Associate's degree | None |
| 29-9021 | Health Information Technologists and Medical Registrars | 1,112 | \$28.25 | \$24.76 | Postsecondary nondegree award | None |
| 49-2011 | Computer, Automated Teller, and Office Machine Repairers | 2,164 | \$18.49 | \$16.21 | Some college, no degree | None |

