Seismic Shifts in the Talent Landscape:

2023 TechPoint Indiana Tech Workforce Report

January 2023

TECHPOINT

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Executive Summary

We are entering an economic age of digital innovation. Rapid adoption of digital technology, accelerated in response to the COVID pandemic, is driving economic growth in multiple sectors in Indiana. It is also increasing competition for the talent necessary to carry out that digitalization.

Nearly three-quarters of Indiana's tech workers are employed outside the tech sector, illustrating the widespread need for tech talent. It also shows how tech talent shortages present a broad-based threat to Indiana's economic growth and the productivity improvement and resulting financial well-being of Hoosiers. Difficulty in accessing tech talent is the greatest barrier to greater digitalization across all sectors, based on a 2021 Gartner survey of Information Technology executives citing the talent shortage as the most significant adoption barrier to 64 percent of emerging technologies compared with just 4 percent in 2020.

This report lays bare the challenges, and also shows areas of opportunity for stakeholders in Indiana's tech community. Recent data indicates, for example, that Indiana disproportionately benefited from tech worker migration during the pandemic. In fact, remote worker shift during the pandemic grew Indiana's resident tech workforce by 8.4 percent from May 2021 to April 2022. Only Maryland fared better in this metric. Indiana has multiple opportunities to develop and attract tech talent over the long-term, in particular through the state's robust higher education system, nascent work-and-learn pathways and talent attraction advantages. Work that began in mid-2022 to develop new talent development strategies is already bearing fruit.

Key Findings

1. **Tech talent demand is at a record high and growing:** Digital transformation and automation across all sectors of the Indiana economy makes skilled tech talent a foundational driver of current and future economic growth and employment and an essential part of the statewide workforce, including advanced manufacturing, agriculture, healthcare, life sciences and logistics sectors. Record demand for these workers is expected to grow, especially in emerging technologies such as intelligent systems and automation, cloud platforms, interconnected networks and big data. Indiana's rising demand and tight competition for tech talent mirrors national patterns. With the rise of remote work, Indiana employers are competing in a national talent market. Research shows nearly 1,500 Hoosier tech workers in 2021 were working for companies headquartered outside the state, a number that is expected to grow.

2. **Tech talent supply is falling behind demand:** Despite sustained growth of tech talent in the last decade, tech job hiring figures remain flat, while tech job postings are accelerating. Traditional talent pipelines cannot provide enough talent to outpace Indiana's declining working-age workforce. Expansion of our talent pipeline calls for additional pathways of talent development into the workforce and for more inclusivity.

3. **Indiana's economy demands additional tech talent:** Tech and tech-driven companies contribute $51 billion in Indiana Gross Domestic Product (GDP) and digital adoption and transformation is making tech increasingly core to Indiana GDP growth. For every 10,000 tech or tech-related jobs added to the workforce, Indiana gains an average of $698 million in wages and $103 million in state and local taxes. Tech industry jobs pay more than double the state's median wage and provide stable employment and strong career growth opportunity.

Recommendations

1. **Indiana community and tech sector leaders must promote broader and faster adoption of digital technologies throughout its economic sectors. This cannot happen unless they also develop the talent necessary to implement that adoption.**

a. Meet employer demand for tech-reliant talent, by advancing resident worker skills, retaining college graduates, developing robust non-degree pathways and opening doors for global talent pipelines.

b. Promote early exposure programs, work-based learning experiences, aligned advising and early career pathways into tech and tech-reliant roles to align with future education and training opportunities to create clear, robust pathways for future career progression.

c. Develop and adopt specific solutions to address historical barriers to entry for under-represented, under-supported groups like women, Blacks and Hispanics.

d. Create incentives like an employer-side student loan repayment program, to encourage talent developed in Indiana to stay and work in Indiana.

e. Assess Indiana tax policies and incentives to support Indiana attraction of remote workers and employer hiring of remote talent in critical demand areas.

2. **Indiana's employers must reform traditional hiring practices to better, more equitably and inclusively develop talent, aligning supply and demand, and supporting both talent and employers.**

a. Expand and scale a robust state-wide system of adult apprenticeship for skilling, re-skilling and up-skilling in tech and tech-reliant roles.

b. Encourage and support employers and talent developers to adopt a skill-based approach to hiring, developing and retaining talent.

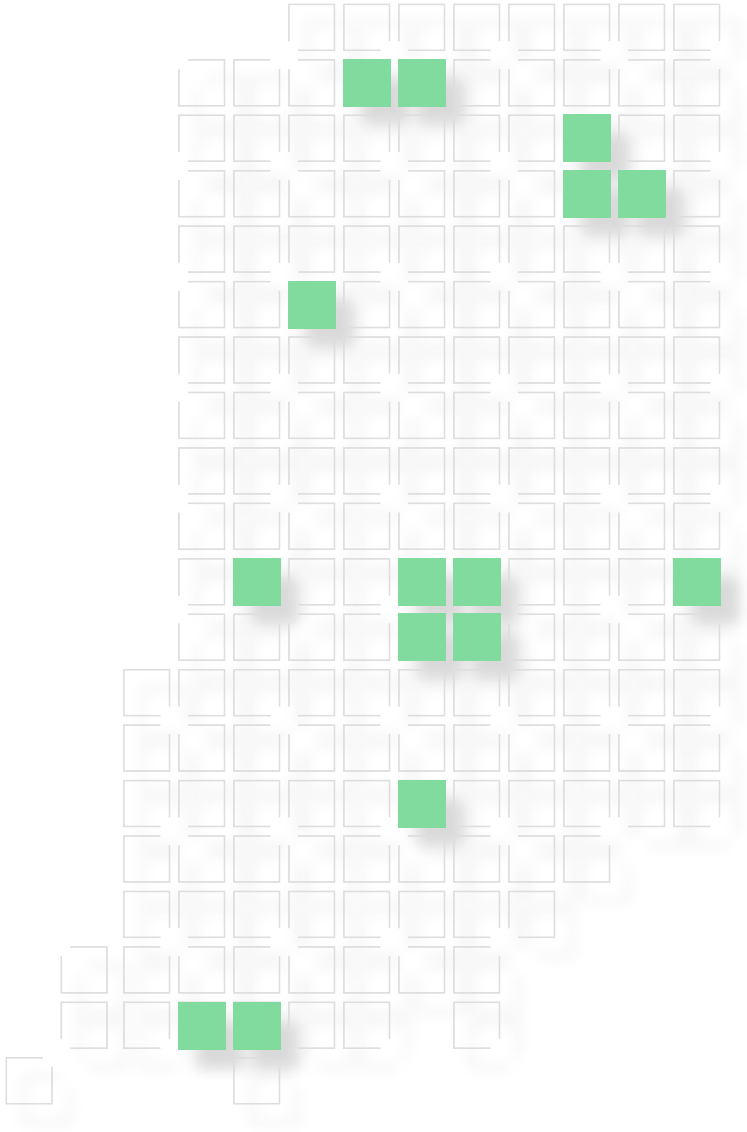
c. Encourage employers to recruit graduates of Indiana educational facilities whether they are from in-state, out-of-state or out-of-the country, and support pathways for highly skilled international graduates.

3. **Indiana community stakeholders and employers must keep tech talent investments a top priority.**

a. The data is clear: tech talent challenges did not develop overnight, nor will they be resolved in the short-term.

b. Programs and investments in tech talent development should be driven by data, insights and proven outcomes, based on a shared understanding by employers, educators and talent developers, government partners and community organizations.

As you will see, these challenges are not unique to Indiana. What is unique is our history of collaborating to overcome huge issues. It is in working together that we overcome the seismic shifts in the talent landscape.



Overview and Purpose

The 2022 TechPoint Indiana Tech Workforce Report is part of a series of annual reports designed to describe and characterize the tech talent landscape across Indiana, including snapshots of Central Indiana and Marion County. In this report, TechPoint provides data and analysis on tech jobs, skills, industries, economic impact, education and training and gaps within the tech workforce ecosystem. Findings from these topics are used to identify strategies and recommendations to improve tech talent outcomes in Indiana.

The broad scope of analysis for this report is intended to provide readers with a comprehensive perspective on tech talent trends. The breadth and level of detail made available through the report is designed to capture pandemic disruptions and trends through the COVID pandemic.

The report's recommendations were developed for tech stakeholders and leaders to identify relevant talent gaps and pursue strategies that improve outcomes and opportunities through Indiana's tech economy.

Detailed interactive data visualizations developed for this report can be found on the TechPoint website.

Introduction

The COVID pandemic disrupted workforce ecosystems around the globe but also accelerated and amplified demographic and economic trends long underway. Tech industry and tech workforce indicators showed remarkable resilience through 2020 followed by widespread growth in 2021 as the response to COVID accelerated digital adoption and transformation. This growth, however, exacerbated longstanding challenges for employers seeking tech talent and greatly heightened competition for talent.

These challenges are not unique to Indiana. They were also the top workforce challenges nationally, according to a recent national survey of Chief Information Officers (CIOs). Talent shortages pose real barriers to tech adoption throughout the state. A 2021 survey of Information Technology (IT) executives by Gartner revealed that talent shortages posed the largest adoption barrier for 64 percent of emerging technologies, compared to 4 percent in 2020.[1] Nearly three-quarters of Indiana's tech workers are employed outside the tech sector, illustrating how virtually all companies are now tech companies or have a heavy reliance on tech and also how tech talent shortages present a broad-based threat to Indiana's economic growth and the financial well-being of Hoosiers.[2]

Indiana's demand for tech talent far outstrips supply, but this report shows bright spots and areas of opportunity. Recent data indicates that Indiana disproportionately benefited from the tech worker migration and remote worker shift during the pandemic and grew its resident tech workforce by 8.4 percent from May 2021 to April 2022. Only Maryland fared better in this metric.[3] Indiana has multiple long-term opportunities to develop and attract tech talent over the long-term, in particular through the state's robust higher education system, nascent work and learn pathways and talent attraction advantages.[4]

We believe that through collective support and collaboration, Indiana's tech stakeholders can overcome talent shortages and win the competition for talent by investing in bold new talent pathway and alignment programs; pursing diversity, equity and inclusion initiatives; and collaborating more within the tech community.

Key Findings

1. **Digital transformation and automation across all sectors of the Indiana economy makes the availability of skilled tech talent a foundational driver of current and future economic growth and employment. Technology and tech-skilled workers are now essential across all sectors. The ability to attract, develop and retain talent is a key driver across all of Indiana's core industry verticals, including healthcare and life sciences, agriculture and advanced manufacturing and logistics.**

   - The growth of Indiana's tech sector and the digital transformation of all sectors is fueling record demand for skilled tech and tech-related talent across all industry segments, which is expected to consistently increase in the coming years.
   - Emerging technologies such as intelligent systems and automation, cloud platforms, interconnected networks and big data are transforming business models and processes. Employers require a sharply rising number of high-skilled workers with an equally rising level of required tech-related skills and with high learning agility to match the quick pace of change driven by tech innovations.

1. Source: https://www.gartner.com/en/newsroom/press-releases/2021-09-13-gartner-survey-reveals-talent-shortages-as-biggest-barrier-to-emerging-technologies-adoption
2. Source: Lightcast™, www.economicmodeling.com, 2022. Note: Tech industries reference Computer Systems and Design and Related Services.
3. Source: TECNA Report: Tech Workforce Trends - TECNA - Technology Councils of North America
4. For further detail see: Indiana's collision course with a 'perfect storm' shortage of tech talent - TechPoint

- Indiana's rising demand and tight competition for tech talent mirrors national patterns. With the rise of remote work, Indiana employers are competing in a national talent market. Recent tech worker commuting, which includes remote workers telecommuting for firms in other states, shows that a large number of resident Indiana tech workers are now employed outside the state (1,427 in 2021).[5]

2. **Despite sustained growth of tech talent in the last decade, the supply of tech talent is falling further behind employer demand. Tech job hiring figures remain flat, while tech job postings continue to accelerate. Traditional talent pipelines cannot provide enough talent to outpace Indiana's declining working-age workforce.**

- Indiana must increase attraction, development and retention of talent across all stages of the tech talent pipeline from early K-12 school programs through adult skilling, re-skilling and up-skilling programs. And, Indiana must add robust, scalable, quality non-degree pathways for entrants at various career stages.
- The lack of tech workforce diversity excludes large prospective talent pools and prevents equitable access to the benefits and opportunities of the tech community.
- Fewer than 40 percent of Indiana's postsecondary tech graduates begin their tech careers in Indiana.
- Indiana employers continue to significantly restrict talent pools by over relying on bachelor's degrees and years of experience as a proxy for skills and competency.

3. **Tech and tech-driven companies are a growing share of the state's economy and major assets for long-term growth. Indiana's future Gross Domestic Product (GDP) growth is tightly tied to the development and availability of tech talent and tech-led innovation.**

- Tech and tech-driven companies contribute $51 billion in Indiana GDP and digital adoption and transformation is making tech increasingly core to Indiana GDP growth.
- For every 10,000 tech or tech-related jobs added to the workforce, Indiana gains an average of $698 million in wages and $103 million in state and local taxes.[6]
- Tech industry jobs pay more than double the state's median wage, provide stable employment and strong career growth opportunity.

5. Source: Lightcast™ Labor Market Analytics & Economic Data, www.economicmodeling.com, 2022
6. Source: Indiana's collision course with a 'perfect storm' shortage of tech talent – TechPoint, 2022. Note: See the linked TechPoint Strategic Plan Executive Summary.

We can inclusively grow the Indiana tech workforce by 41,000 workers by the year 2030.

Skills-First Hiring | Apprenticeship | Progress Reporting

Mission41K is a collaborative movement to address the largest problem tech employers are facing today—finding, hiring and retaining qualified tech talent. The state's top employers are already joining the movement, working toward the Mission41K goal and sharing their progress. Now it's your turn.

Take the Pledge

Mission41k.com

National Workforce Trends and Context:

Declining Working-Age Population and Exponentially-Rising Talent Demand

In February 2020, a record 70 percent of U.S. businesses reported a talent shortage, according to a Manpower survey.[7] This was more than double the 32 percent of businesses that had reported difficulty finding talent in 2015. Many human resource experts predicted talent shortages would vanish as a result of the pandemic's economic effects, but for many tech and tech-reliant roles, the gaps only worsened.

Lightcast's (formerly EMSI) Demographic Drought, defined the "COVID paradox" as "Millions of people out of work, millions of open jobs unfilled, and millions of people voluntarily bowing out of the labor market. This despite a record number of more than 7 million job openings." The U.S. labor force participation rate, which measures people working or actively seeking work, has dropped to lows unseen since the recession of the mid-1970s. Despite countless dislocations across the country, businesses frantically posting for jobs simply cannot find enough people to fill open positions."[8]

Postsecondary enrollment has also dropped precipitously, breaking a decades old trend. Historically, when the economy shutters, Americans head to school to gain new skills and competencies. But in 2020, postsecondary enrollment fell from 18.2 million students in 2019 to 17.8 million students in 2020, a loss of more than 460,000 students, according to the National Student Clearinghouse.[9] Freshman enrollment sank by a remarkable and record-setting 13 percent.

As the term "COVID Paradox" suggests, many attribute these disturbing trends to the impact of COVID, but this is only half true. COVID did not create these problems. It accelerated digital transformation and the need for a much higher number of highly skilled STEM workers, and it accelerated demographic trends that have long been predicted. The talent shortage and seismic shifts in the workforce were not new. They have been developing and steadily worsening for decades, and they are following accelerated, but predicted projections. As the Demographic Drought report makes clear, "The US is suffering the beginning phases of a great sansdemic—'without people,' or in our case 'without enough people'—a demographic drought that is projected to worsen throughout the century and will impact every business, college, and state. This is no COVID paradox. This is history catching up with us."

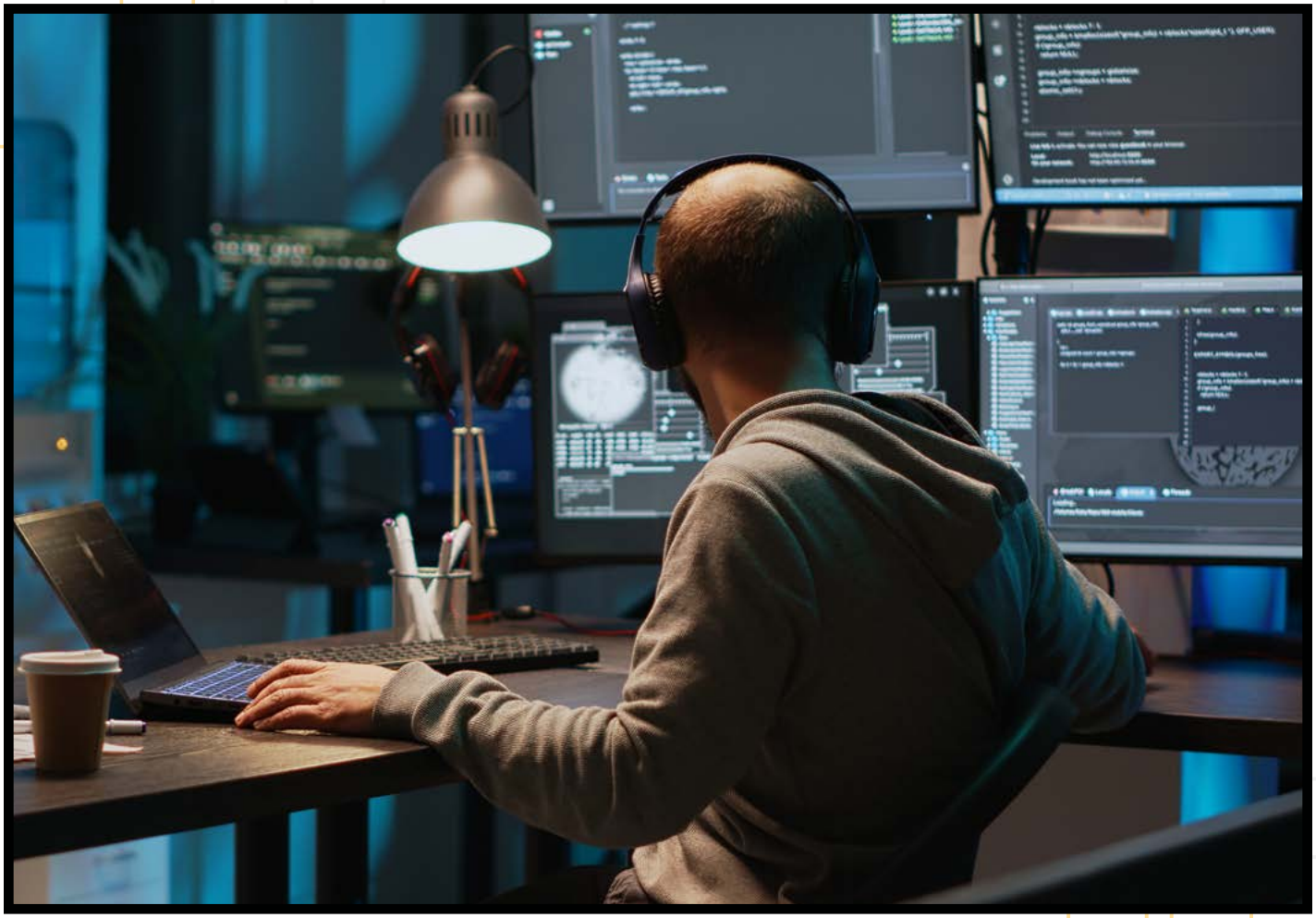
The intersection of the three major trends that have been driving seismic shifts in the workforce have received little attention from the media or in public discourse. These amplified trends have begun to redefine every aspect of the talent ecosystem and this will accelerate over coming decades. These shifts will have precipitous impact. Demographic Drought defines these tectonic drivers as:

- The mass exodus of baby boomers (workforce past) - Last year, the number of baby-boomer retirees increased by more than a million. The largest generation in U.S. history remains a powerful cohort of key workers that still hold millions of roles. Their sudden departure from the labor force will gut the economy of crucial positions and decades of experience that will be hard to fill en masse.
- Record-low labor force participation rate of prime-age Americans (workforce present) - Thousands of Americans have voluntarily opted out of looking for work. The children and grandchildren of baby boomers are not replacing the boomers who leave the workforce. Many cultural and demographic drivers are intertwining to change attitudes towards work, education and lifestyle.

7. Source: Manpower Group, Talent Shortage
8. Source: : Lightcast™, The Demographic Drought
9. Source: Higher Ed Dive. "Colleges enrolled nearly 500,000 fewer students this fall." Published Dec. 17, 2020

- The lowest birth rates in U.S. history (workforce future) - The national birth rate, already in decline, hit a 35-year low in 2019, and the relative size of the working-age population has been shrinking since 2008. In fact, the national population is projected to begin shrinking by 2062. This means that over the next generation, talent shortages will only compound. This is already being profoundly felt as Boomers retire and there are not enough workers to replace them.[10]

Indiana's workforce trends match these national trends, with Indiana having a declining working-age population, decreasing labor participation rate, and diminishing college-age population. These trends are predicted to be especially strong across the Midwest, and Indiana will see the impact of these trends ripple across all aspects of the tech workforce amplifying the seismic impact.



10. Source: Lightcast™, The Demographic Drought, Page 6

Talent Demand:

Rising Need and Increasing Impact

Tech occupations have been major contributors to Indiana's overall job growth trends over the past 10 years, but Hoosier net new tech jobs are not growing quickly enough. Indiana ranks well against other Midwestern states and 16th overall nationally, but tech jobs in Indiana lag national averages in a number of key indicators. Tech jobs are an increasing share of Indiana's job market, but they fall short of the national tech job concentration average by 36 percent. Tech jobs throughout the state increased by 10.6 percent from 2016-2021, (6,918 total) less than the national growth rate of 12.8 percent.[11] On the positive side, Indiana attracted a disproportionate number of new tech workers between May 2021 to April 2022 due to pandemic remote work transitioning,[12] More work must be done to help Indiana meet the global tech talent challenge.

A Regional Leader, but Trailing National Growth: Overall Tech Employment (Net Tech Employment)

Net Tech Employment Growth from Prior Year by State

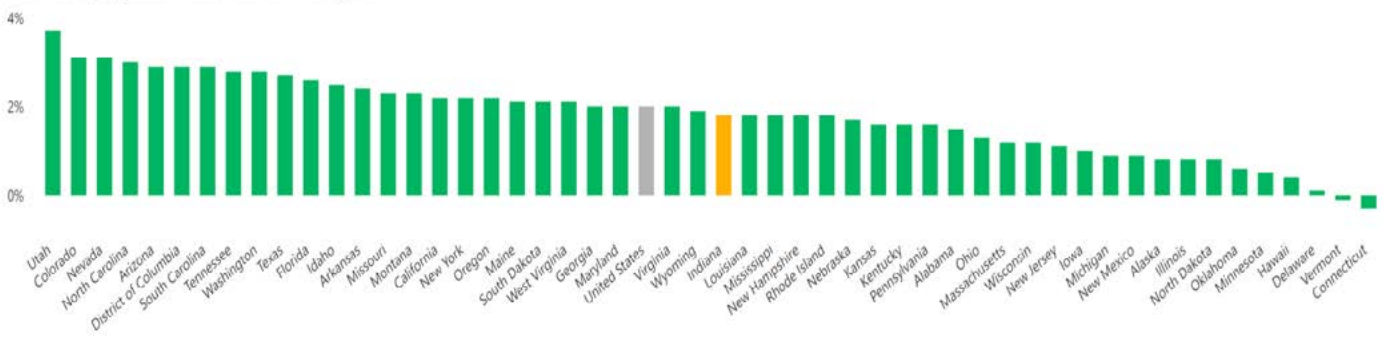


Figure 1 - Source: CompTIA, "State of the Tech Workforce," See: 2022 Report

The tech job ecosystem consists of individuals employed in core tech occupations, and also a rapidly growing number of individuals working in tech-reliant roles (such as sales, marketing, HR, and many other roles) who provide essential support to the delivery of products and services. CompTIA's annual "State of the Tech Workforce" incorporates both groups in its Net Tech Employment metric. The report shows in 2021 Indiana ranked in the top 20 states for net tech job growth for both total and percent growth from the prior year.[13] Yet, Indiana's net tech job growth rate fell below the national average in 2022. Indiana is not matching the national pace of digital transformation and workforce development, though it is a regional leader.

Similar to state trends, Indianapolis recently made strides in tech job growth, but recent 2022 rankings raise concerns. In 2021 Indianapolis ranked in the top half of cities for net tech job growth for both total and percentage growth from the prior year. However, in 2022 Indianapolis' net tech job growth rate fell below the national average. This reflects the dearth of available talent, not a decrease in demand.

11. Source: Lightcast™ Labor Market Analytics & Economic Data, www.economicmodeling.com, 2022; Workforce Availability Report
12. A recent report from TECNA ("Tech Workforce Trends: The Migration of Tech Jobs Since the Pandemic") utilized a variety of different data sources to show recent talent migration, remote work, and talent growth patterns. Under this analysis, Indiana's tech workforce grew by 8.4% from May 2021 to April 2022 , the second fastest growth rate in the nation behind Maryland. Source: The Technology Councils of North America (TECNA), Tech Workforce Trends: The Migration of Tech Jobs Since The Pandemic, https://www.tecna.org/tech-workforce-trends/. Notes: Report uses different SOC code list to define "Tech Workers" and different data sources than this report.
13. Source: CompTIA, 2022 State of the Tech Workforce. See: https://www.cyberstates.org/

Net new tech jobs are spread throughout Indiana's industry segments and are driving innovation and growth across these sectors. Bureau of Labor workforce categories show that computer systems and design services employ more than a quarter of the tech workforce, but many other industries are saturated with tech workers.[14] Management of companies and enterprises, management consulting, commercial banking and insurance carriers represent Bureau of Labor industry segments with a strong concentration of tech workers and a relatively large share of their overall workforce. Education, General Medical and Surgical Hospitals and government (State and Local) employ tech workers in large numbers, though they comprise a smaller share of their overall workforce.

Demand Growth by Tech Occupation

Tech Jobs (Top 10), Historical and Projected

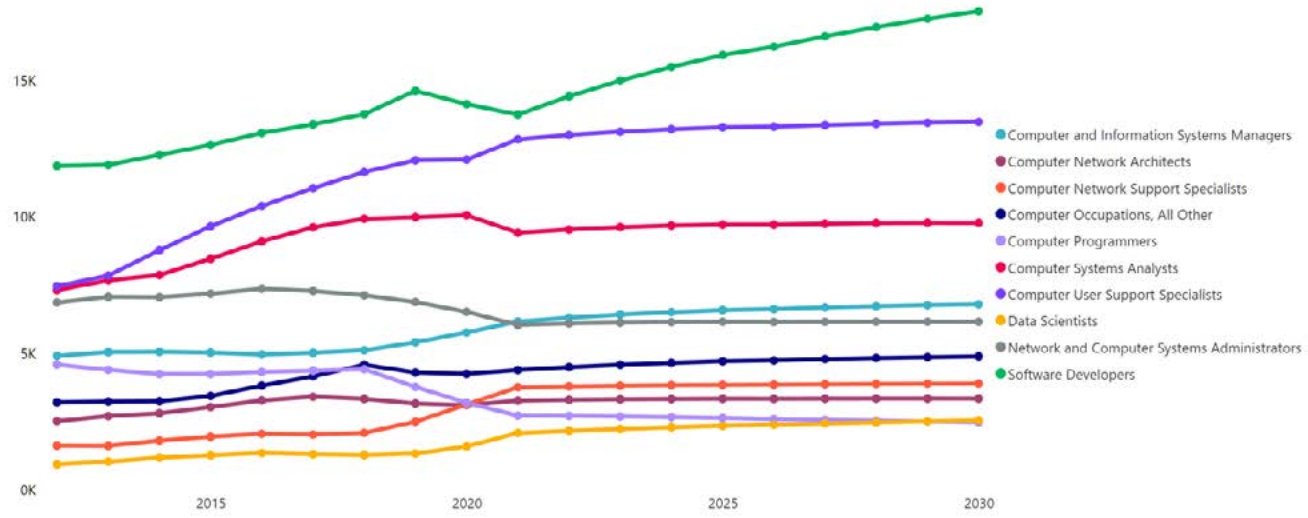


Figure 2 - Source: Lightcast™ Labor Market Analytics & Economic Data, www.economicmodeling.com, 2022

Tech occupational growth has historically tracked with national growth in Indiana and the Metropolitan Statistical Area (MSA) of Central Indiana, while Marion County has struggled to keep pace. The pandemic appears to be an inflection point for tech job growth, resulting in continued acceleration at the national level and weaker growth at the statewide, MSA, and Marion County levels. The 2020 to 2022 years are most decisive, with MSA and Marion County experiencing negative growth through 2021 (Indiana statewide tracks with national growth levels) and rebounding modestly in 2022 at all levels compared to the nation. Projections for Indiana suggest an even slower tech job growth rate of 8.7 percent from 2021-2026, placing the state further behind the 10.5 percent national growth projection.

At the individual occupation level, the state, the central Indiana MSA, and Marion County lag most in software developer, data scientists, database architects, computer and information scientists and web/digital interface designers. However, there is relatively strong growth in computer/information research scientists, computer hardware engineers, computer systems analysts, computer user support specialists and information security analysts.

14. Industry data is provided at the NAICS 5-digit level of detail. For further detail on tech job employment by industry see Appendix, "Tech Occupations by Industry."

Percent Growth from 2012 - Historical and Projected

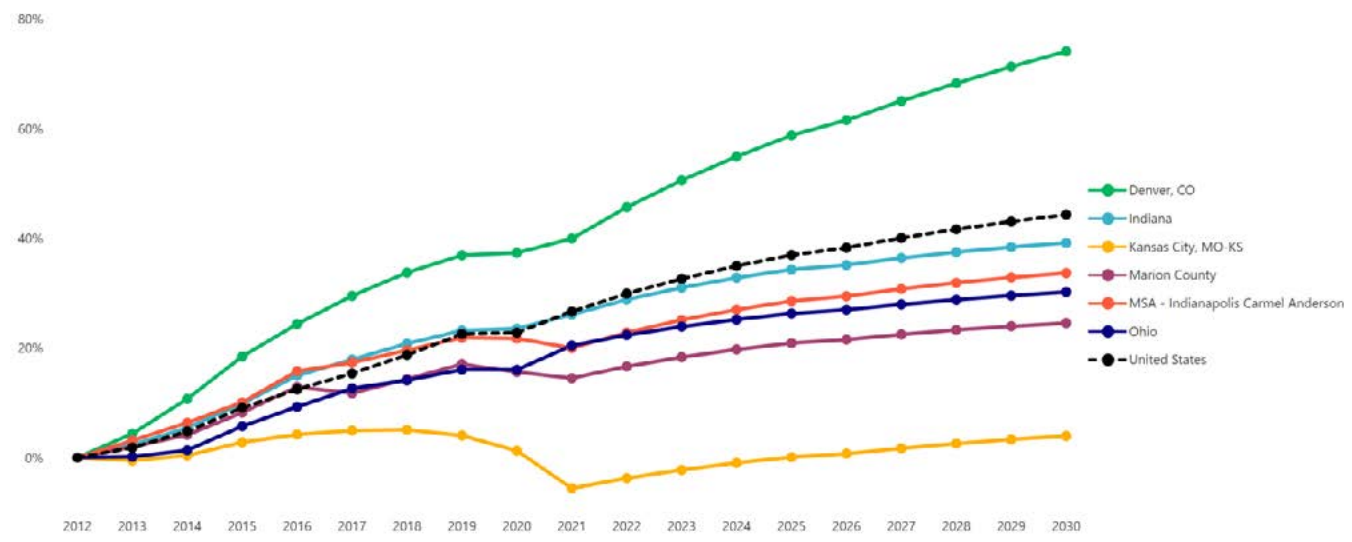


Figure 3 - Source: Lightcast™ Labor Market Analytics & Economic Data, www.economicmodeling.com, 2022

Indiana's tech job landscape is on an overall growth trend, with some occupations accelerating faster than others. Software Developers are in highest demand at all geographic levels in Indiana and throughout the nation. Projections indicate Software Developer jobs will continue growing faster than all other tech occupations. Though masked because they are spread across categories, demand for cybersecurity roles is also exceptionally high. Computer systems analysts and computer user support specialists are also in high demand with more modest growth anticipated in the future. By contrast, in recent years, Network and Computer Systems Administrators have declined. Job trends and rank/order composition of Indiana's tech occupations are largely consistent with national job patterns.[15]

Software Developers and Cybersecurity Lead the Way: Exponential Increases in Demand across the State and Sectors

Tech job postings have more than doubled in five years, with strong growth in pre-pandemic years followed by major increases since 2021. These surges have not resulted in greater tech job hiring activity, though, as average tech occupation hiring has been flat since 2012. Indiana's stagnant hiring figures suggest strongly that available tech talent is falling well short of employer demand.

Tech Job Posting and Average Monthly Hires

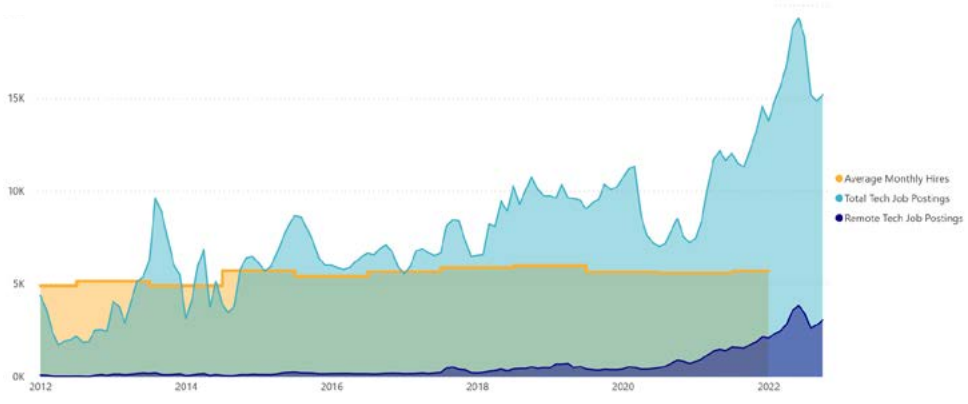


Figure 4 - Source: Lightcast™ Labor Market Analytics & Economic Data, www.economicmodeling.com, 2022

14. Source: Lightcast™ Labor Market Analytics & Economic Data, www.economicmodeling.com, 2022. Job Analytics Report

In Indiana employers are most in need of software developers, web and digital interface designers, and computer user support specialists.[16] Since late 2021 postings for software developers have surged above other tech occupations. As noted above, while masked in the Bureau of Labor Statistic job categories, cybersecurity roles have also exponentially increased over the past several years.

The Talent Indiana Needs Most: In-Demand Skills and Competencies

Top 10 Skills in Indiana Tech Job Postings

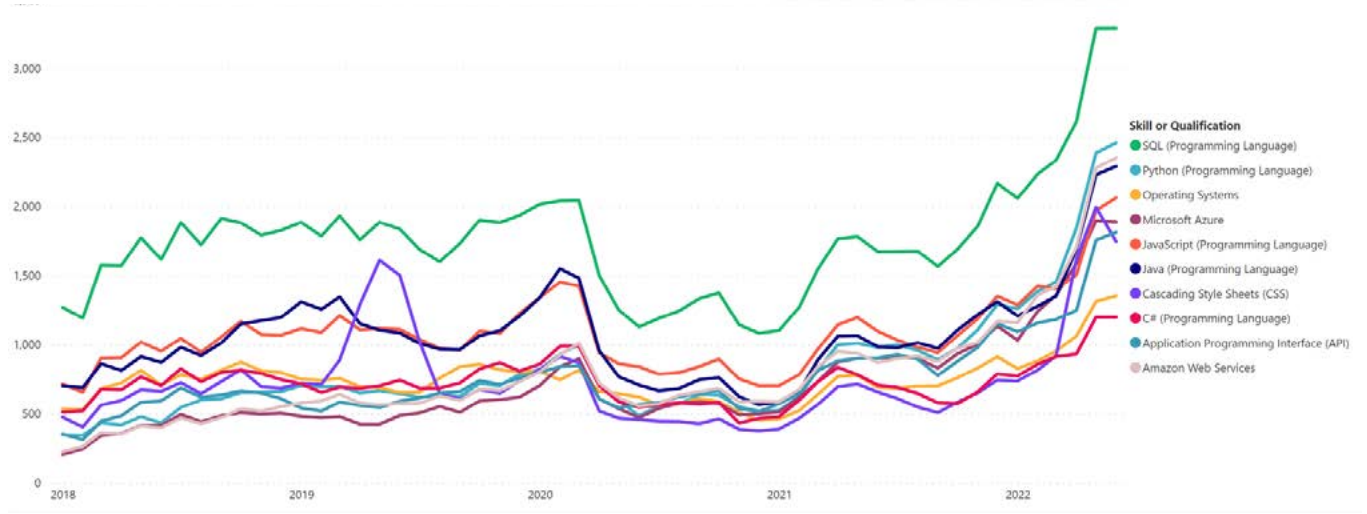


Figure 5 - Source: Lightcast™ Labor Market Analytics & Economic Data, www.economicmodeling.com, 2022

Tech job postings consist of technical ("specialized") and foundational ("common") skills.[17] Top foundational skills include communications, management, problem solving and troubleshooting. Top technical skills include agile methodology, automation, software development and software engineering. Interestingly, tech job postings in the central Indiana MSA and Marion County are more likely to reference technical skills than statewide postings. Certificated skills are much less frequently referenced. Certificated skills relating to information systems security and security/secret clearance are most common.

Viewing skill references in tech job postings over time reveals that foundational skills are stable and consistent. Tech employers are consistently seeking applicants with communication, management and problem-solving skills. Technical software skills trends are more variable over time. SQL programming language remains the most referenced technical software skill, but Python programming language and Amazon Web Services have increased significantly since 2021. HTML and C# programming languages remain in high demand but possess more modest posting trends over time.

16. For detail see Appendix "Job Postings by Occupation"
17. In Lightcast data, skills are competencies at specific tasks or familiarity with specific subjects and tools acquired through education or experience. See: Skills – Knowledge Base (emsidata.com)

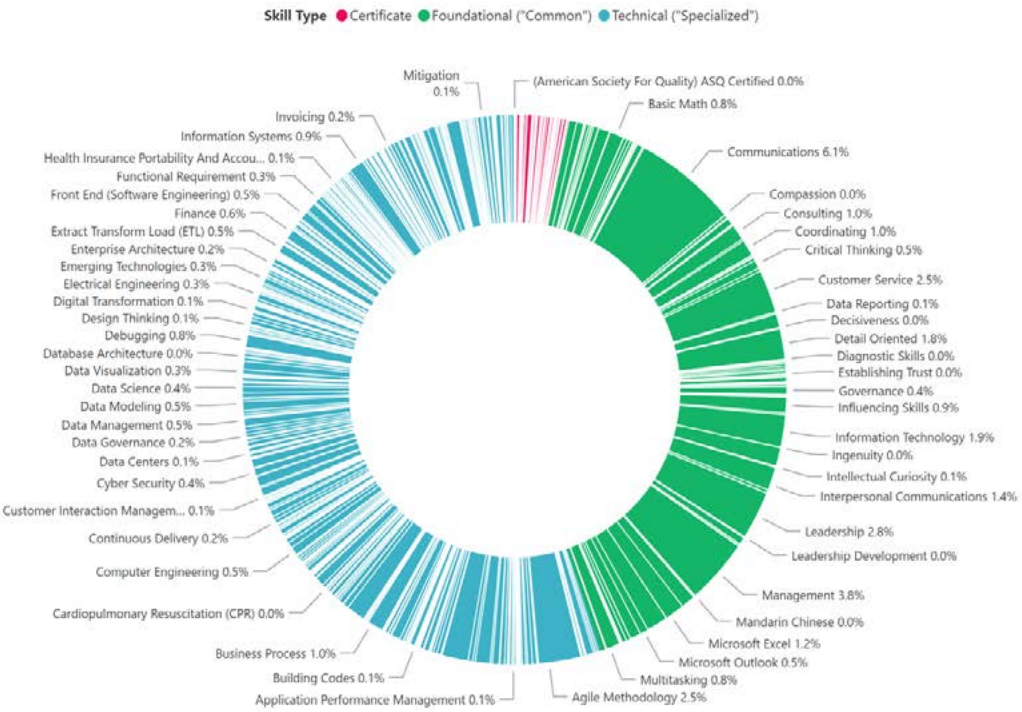


Figure 6. Source: Lightcast™ Labor Market Analytics & Economic Data, www.economicmodeling.com, 2022

Notes: In Lightcast data, skills are competencies at specific tasks or familiarity with specific subjects and tools acquired through education or experience.
-*Technical* ("Specialized") Skills: Skills that are primarily required within a subset of occupations or equip one to perform a specific task (e.g. "NumPy" or "Hotel Management"). Also known as technical skills or hard skills.
-*Foundational* ("Common") Skills: Skills that are prevalent across many different occupations and industries, including both personal attributes and learned skills. (e.g. "Communication" or "Microsoft Excel"). Also known as soft skills, human skills, and competencies.
-*Certificate:* Recognizable qualification standards assigned by industry or education bodies (e.g. "Cosmetology License" or "Certified Cytotechnologist").

Certificated skills as a category are less sought after than foundational or technical skills. Among the postings referencing certificated skills, there is strong demand for applicants with certificates and credentials in information systems security, security clearance, project management and secret clearance. An important coda to this understanding is that the rising focus on a skills-based approach to hiring, rather than a focus on degrees, credentials, and years of experience is evident in the decreasing requirement of such in job descriptions.

Unnecessary Restrictions Limit Talent Pools: Degree and Years of Experience Hiring Expectations

Indiana employers continue to significantly restrict their talent pools by over relying on bachelor's degrees and years of experience as a proxy for skills and competency. Across tech roles, 47.6 of job listings called for a bachelor's degree in 2022 and 24.6 percent called for an associate degree.[18] Only 33.6 percent of job descriptions in 2022 did not call for a specific degree requirement or accepted a high school diploma as a minimum requirement.

By focusing on degrees and years of service, companies significantly reduce their pools of candidates, eliminating many who have the skills and competencies to fill the positions, but get screened out. In 2022, 29.8 percent of descriptions listed no specific number of years required. Nearly 8 percent required one year of experience.[19] The

18. Source: Lightcast™ Labor Market Analytics & Economic Data, www.economicmodeling.com, 2022
19. Source: Lightcast™ Labor Market Analytics & Economic Data, www.economicmodeling.com, 2022

plurality of jobs (44.1 percent) called for early career talent with two-to-five years of experience, and 16.4 percent of job postings called for mid- and senior-career talent with more than six years of experience. Collectively, years of experience and degree requirements eliminate up to 90 percent of applicants and deny employers the opportunity to interview and consider candidates on the basis of skills, competencies and fit.

A bright spot in the analysis reveals the 2022 work of TechPoint, the Markle Foundation, and other TechPoint Mission41K partners have begun to reduce Indiana employers' reliance on degrees, credentials and years of experience. This is reflected in the reduction in demand for bachelor's degrees and higher from 60 percent in 2021 to 58 percent in 2022. It is important to note that the decreasing requirement for these degrees and credentials does not reflect a decreasing value, need or demand for them, but rather a re-focusing on describing the skills provided and mastered through them.

Indiana's Tech Wages are Both a Competitive Advantage and Disadvantage: Post-Pandemic Tech Wages and Earnings

The cost of tech talent in Indiana remains low. The national median salary for workers across all tech and tech-reliant jobs is $98,977, while Indiana workers earn a median salary of $77,585. After adjusting for Indiana's affordable cost of living (4.8 percent below average), these tech workers earn $82,778 - more than $16,000 below the national median wage.[20]

Some observations of note: computer and information systems managers are the highest paid tech occupation. Indiana's software developers have seen median earnings steadily increase since 2016, but earn less than computer network architects, computer hardware engineers and software quality assurance analysts and testers.

Median Annual Earnings in Tech Jobs

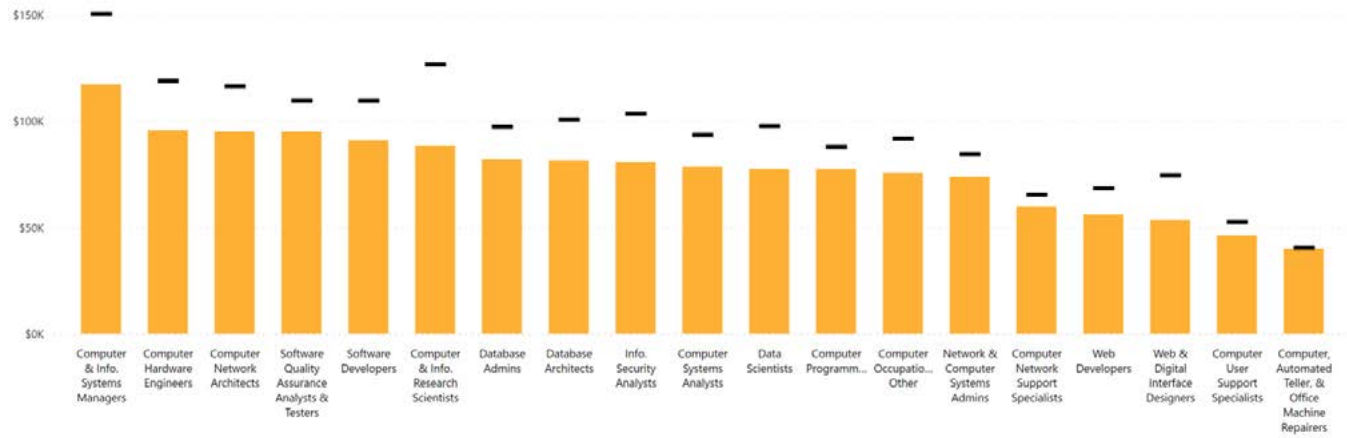


Figure 7 - Source: Lightcast™ Labor Market Analytics & Economic Data, www.economicmodeling.com, 2022; Note: Annual earnings are not cost of living adjusted

Computer and information research scientists appear to earn comparably more at the national level than in Indiana. Overall, Indiana's current wage structure makes Indiana a highly attractive site for tech and tech-driven companies. Indiana's low cost-of-living and rich amenities make the state highly competitive as a residence for remote workers. Conversely, Indiana's low wages put Indiana firms at a hiring disadvantage for attracting and retaining workers who can find employment nationally as remote work proliferates.

20. Source: Lightcast™ Labor Market Analytics & Economic Data, www.economicmodeling.com, 2022. Compensation Analysis Report.

Tech Talent is the Innovation Driver Across Indiana's Key Economic Sectors

Indiana's tech industries are vital to the future of Indiana's overall economy. These industries are on an overall growth trajectory, which is good for the state and tech workers. In 2021, tech sector companies generated $14.8 billion in total GDP, $6.4 billion in property income and $486.5 million in tax revenue.[21] With job growth from 2021 to 2026 projected at 9 percent, these industries will need talent to fill new jobs. Core tech employers will need skilled talent and, with core tech average earnings per job at $112,480, these jobs pay well above Indiana's median wage.

Tech industry jobs present opportunities for Hoosiers seeking stable employment, good pay, and strong career growth prospects. The Indiana tech sector must identify new, innovative and equitable strategies for growing the tech industry workforce.

Tech Occupation Demand by Industry

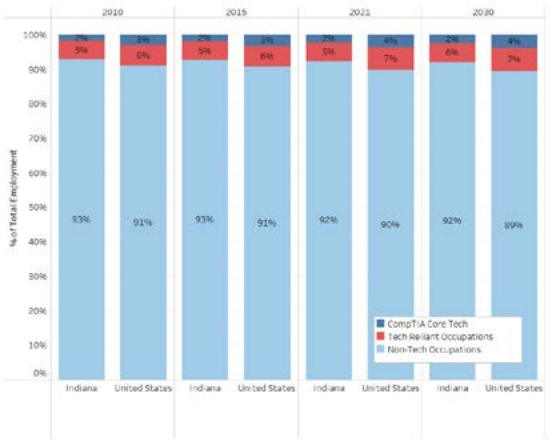
Tech jobs are spread across Indiana's industries. Computer systems and design services positions account for more than a quarter of the tech workforce, most industries employ many tech workers and are dependent on talent in tech-reliant roles for growth and innovation.

Industry (NAICS 5)	Tech Jobs in Industry (2021)	Tech Jobs as Percent of All Industry Jobs (2021)	Percent of All Tech Jobs in Industry (2021)
Computer Systems Design and Related Services	19,219	57.2%	26.5%
Management of Companies and Enterprises	4,480	13.2%	6.2%
Temporary Help Services	3,285	4.3%	4.5%
Education (State Government)	2,132	4.1%	2.9%
Management Consulting Services	2,049	8.9%	2.8%
Direct Life, Health, and Medical Insurance Carriers	1,534	11.3%	2.1%
Local Government, Excluding Education and Hospitals	1,533	1.6%	2.1%
General Medical and Surgical Hospitals	1,442	1.2%	2.0%
Data Processing, Hosting, and Related Services	1,372	42.5%	1.9%
Wired and Wireless Telecommunications Carriers	1,360	16.8%	1.9%
Commercial Banking	1,271	6.5%	1.8%
Engineering Services	1,271	8.0%	1.8%
Education (Local Government)	1,268	0.9%	1.7%
State Government, Excluding Education and Hospitals	1,167	3.7%	1.6%
Software Publishers	1,120	47.2%	1.5%
Direct Insurance (except Life, Health, and Medical) Carriers	1,104	10.5%	1.5%
Medical, Dental, and Hospital Equipment and Supplies Merchant Wholesalers	964	15.5%	1.3%
Federal Government, Civilian, Excluding Postal Service	927	3.4%	1.3%
Colleges, Universities, and Professional Schools	824	3.7%	1.1%
Electronic and Precision Equipment Repair and Maintenance	794	28.4%	1.1%
Electronic Shopping and Mail-Order Houses	766	5.3%	1.1%
Research and Development in the Physical, Engineering, and Life Sciences	708	17.4%	1.0%
Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	670	11.0%	0.9%
Accounting, Tax Preparation, Bookkeeping, and Payroll Services	609	3.3%	0.8%
Pharmaceutical and Medicine Manufacturing	574	2.8%	0.8%
Other Insurance Related Activities	564	8.9%	0.8%
Electronics and Appliance Stores	554	7.7%	0.8%

Figure 8 - Source: Lightcast™ Labor Market Analytics & Economic Data, www.economicmodeling.com, 2022
Notes: Industry data is provided at the NAICS 5-digit level of detail.

21. Source: Lightcast™ Labor Market Analytics & Economic Data, www.economicmodeling.com, 2022

Overall Shares of Core Tech & Tech-Reliant Occupational Employment Represent a Minority of all Jobs, But Have Extremely Outsized Impacts on the Ability of Regional & National Economies to Compete



TECONOMY PARTNERS LLC

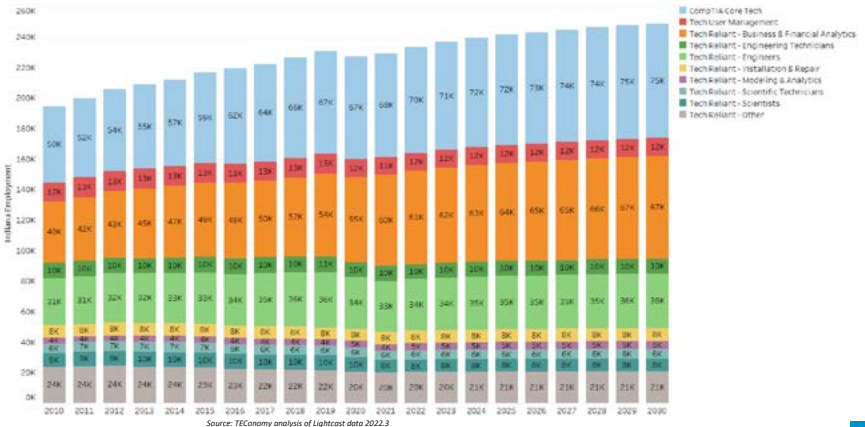
Source: TEConomy analysis of Lightcast data 2022.3

Preliminary Analysis For Internal Discussion Only – Not for Distribution

5

Management, consulting, commercial banking and insurance are among sectors with a high percentage of tech workers. Education, agriculture, medicine and life sciences, and government also include a high percentage of tech workers, though they represent a smaller overall percentage of the workforce.

Outside of Core Tech Occupations, Indiana's Tech-related Workforce Driven by Business & Financial as well as Engineering Occupations



TECONOMY PARTNERS LLC

Source: TEConomy analysis of Lightcast data 2022.3

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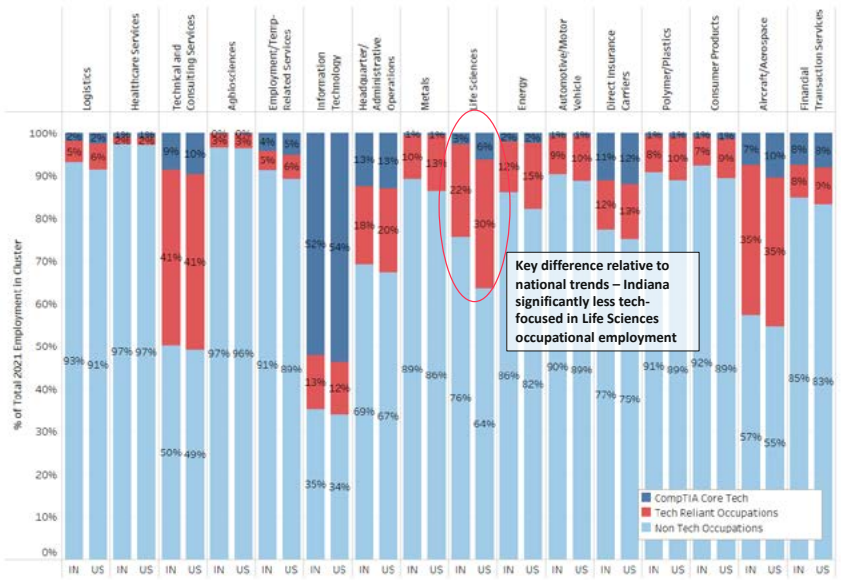
Staffing Patterns Perspective: Indiana's Core Tech & Tech-Reliant Occupational Mix is Currently Slightly Less Tech-Focused Than National Occupational Employment Makeup



TECONOMY PARTNERS LLC

Source: TEConomy analysis of Lightcast data 2022.3

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11

Take your place among innovators

Join the Tech Directory

We house the state's premier interactive tech company directory, and make it easy to find, buy from, or invest in the organizations that are driving digital innovation in Indiana. Additionally, organizations that claim a free TechPoint Tech Directory profile may also submit job postings to our Job Board at no cost.

Add your company today

Connect to top talent in tech

Share your listings to the free Job Board

Use the largest job board dedicated solely to jobs in tech in the state of Indiana to hire your next superstar.

Post a job listing

The Demographics of Tech Talent:

A Lack of Diversity Threatens Future Economic Growth

In recent years there has been increasing awareness and focus on the lack of diversity in the national tech workforce as White and Asian males have been historically overrepresented. Indiana matches this pattern statewide, and it is especially pronounced in the central Indiana MSA and Marion County, where racial/ethnic gaps are especially prominent and persistent. [22]

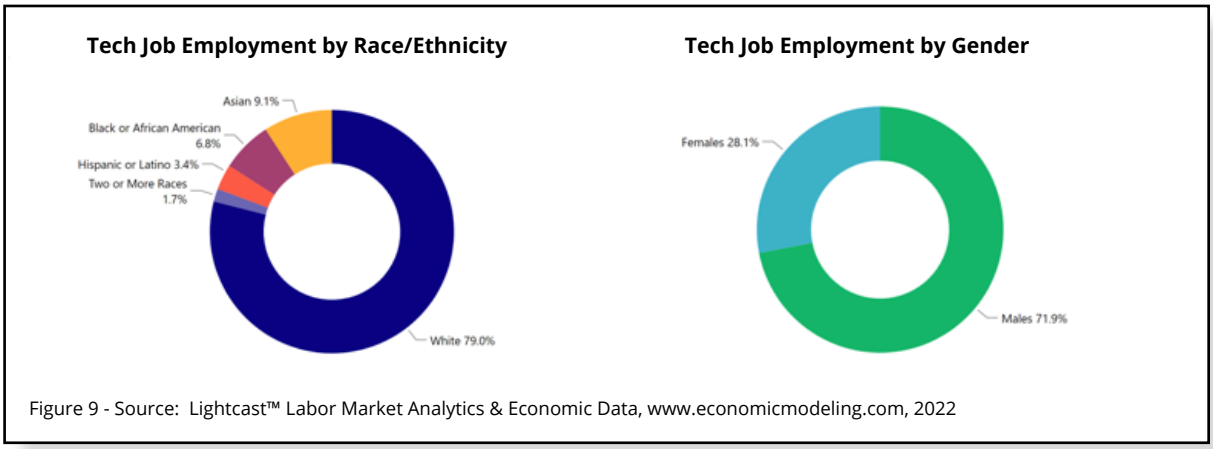


Figure 9 - Source: Lightcast™ Labor Market Analytics & Economic Data, www.economicmodeling.com, 2022

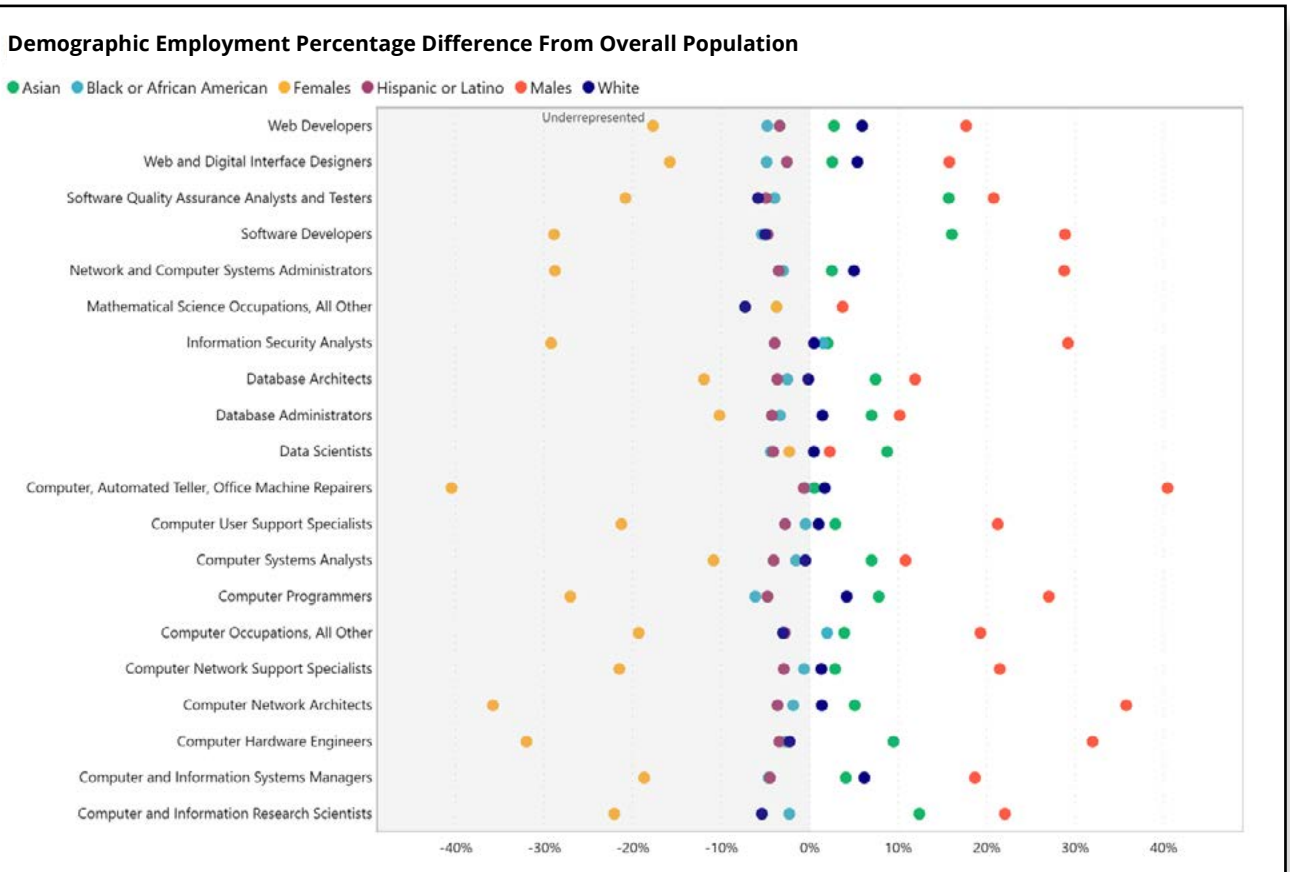


Figure 10 - Source: Lightcast™ Labor Market Analytics & Economic Data, www.economicmodeling.com, 2022
Note: This visual compares the demographic composition of each occupation with the demographic composition of Indiana's overall population. Positive demographic compositions indicate overrepresentation in the occupation, while negative values indicate underrepresentation.

22. Source: Lightcast™ Labor Market Analytics & Economic Data, www.economicmodeling.com, 2022

The most significant disparity is women in tech and tech-related roles. Women are highly underrepresented in every tech occupation at every geographic level. A recent report from the Technology Councils of North America (TECNA) indicates Indiana's tech worker gender gap is the 4th largest in the nation.[23] Blacks and Hispanics and Latinos are also significantly underrepresented across tech occupations.

Resolving gender/race /ethnicity gaps isn't just an equity imperative; it is essential for long-term business and economic success. An opportunity results from recent increases in higher education enrollments among these demographics. Education leaders and employers can increase diversity in the tech talent supply pipeline by encouraging these students to pursue tech degrees and careers.

Total Computer and Information Science and Support Services Degree Completions at Indiana Postsecondary Institutions by Demographic Group

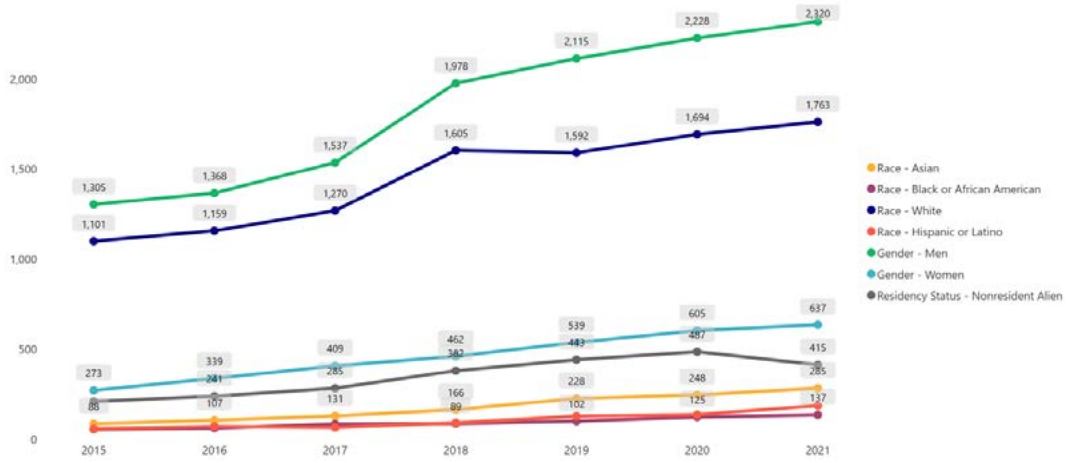


Figure 11 - Source: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS)
Note: Data represents degrees awarded at all Indiana postsecondary institutions. The Short-term Award/Certificate category includes all certificate types, including short-term, long-term, and post-Bachelor's/Master's certificates. Nonresident alien is defined by IPEDS as, "A person who is not a citizen or national of the United States and who is in this country on a visa or temporary basis and does not have the right to remain indefinitely."

Demographics and Tech Degrees

Tech Job-Aligned Completions as Percent of Total Completions - 2015 to 2020

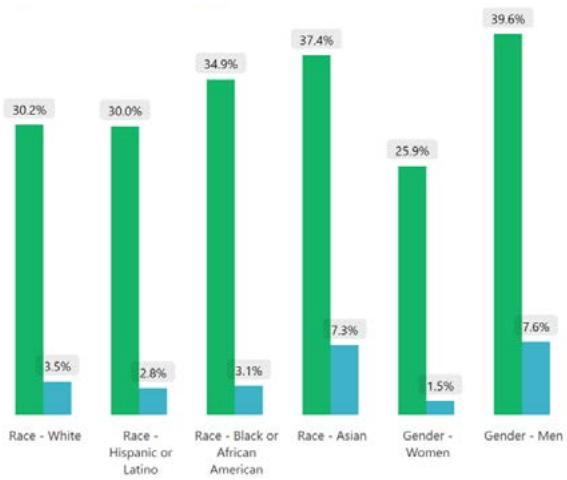


Figure 12 - Source: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS)
Note: Data represent degrees awarded at all Indiana postsecondary institutions.

Percent Growth in Degree Completions - 2015 to 2020

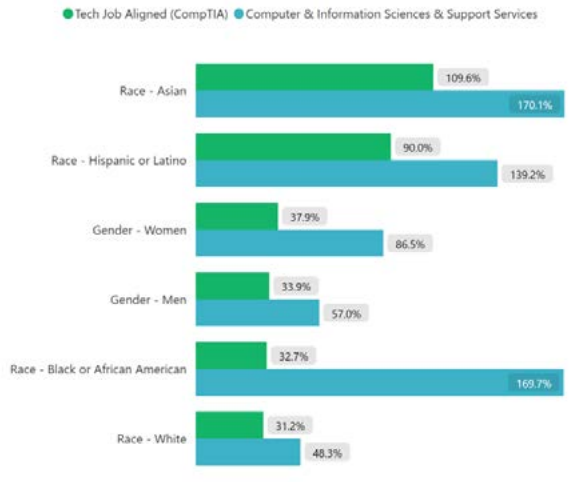


Figure 13 - Source: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS)
Note: Data represent degrees awarded at all Indiana postsecondary institutions.

23. https://www.tecna.org/tech-workforce-trends/ and https://www.prnewswire.com/news-releases/new-report-from-tecna-reveals-winners-and-losers-in-tech-migration-during-covid-19-pandemic-301543551.html

Annual completion of tech job-aligned degrees is increasing across demographic groups. These completion outcomes diverge by race, ethnicity and gender status. Men and Asian students are much more likely to complete tech-aligned and computer & information sciences & support degrees than other demographic groups. Men are currently more than five times as likely as women to secure degrees in computer & information sciences & support degrees. Asian students are more than twice as likely to complete computer & information sciences & support degrees than other racial and ethnic groups.

Disparities in tech diversity become even more pronounced through the degree completion when we compare associate degrees, bachelor degrees and graduate degrees. Between 2015 and 2020, Black or African American students were significantly less likely to complete a bachelor or graduate level degree in both tech-related and computer & information sciences & support degrees. For computer & information sciences & support degrees specifically, Black or African American students are much more likely to pursue associate's or short-term awards/ certificates than other demographic groups. Hispanic or Latino students pursue computer & information sciences & support degrees at comparably high levels, second only to Asian students.

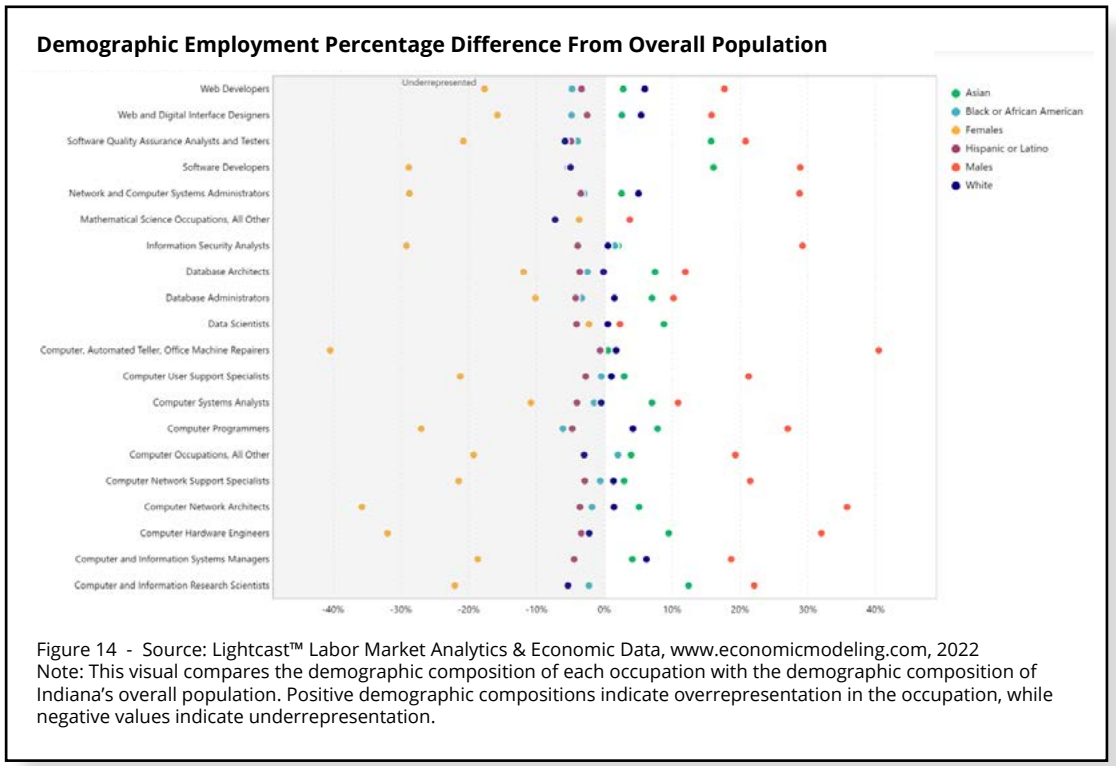
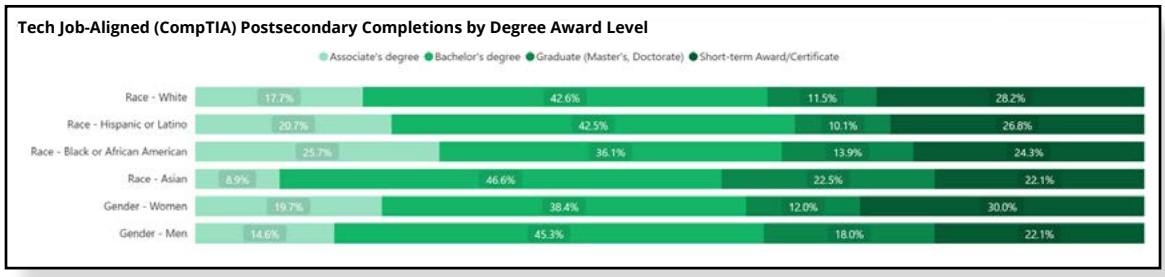


Figure 14 - Source: Lightcast™ Labor Market Analytics & Economic Data, www.economicmodeling.com, 2022
Note: This visual compares the demographic composition of each occupation with the demographic composition of Indiana's overall population. Positive demographic compositions indicate overrepresentation in the occupation, while negative values indicate underrepresentation.



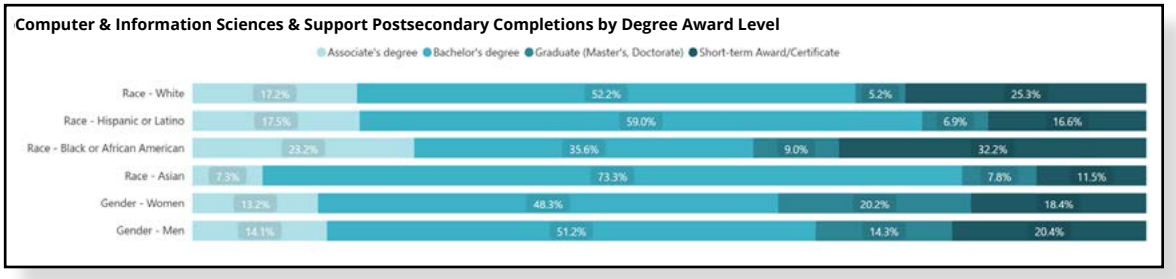


Figure 15 - Source: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS)
Note: Data represent degrees awarded at all Indiana postsecondary institutions.

Indiana's poor educational attainment outcomes are an obstacle to long-term economic growth and prosperity.

At 27 percent, the share of Indiana's population with a bachelor or higher degree is the 10th lowest in the nation. The national average is 33 percent.[24] These outcomes are consistently worse for Indiana's Black or African American (19 percent) and Hispanic or Latino (16 percent) communities. The rate of Indiana's Black or African American population attaining a bachelor or higher degree is the 13th worst in the nation and 10th worst for the Hispanic or Latino population. These achievement gaps impact employers in all sectors throughout the state, including tech. Problems relating to the availability of degreed tech talent are part of statewide educational attainment shortcomings. Addressing degreed tech talent shortfalls requires focus on the large-scale, systematic equity gaps throughout the educational system.

The tech sector and Indiana's economy at large needs more skilled talent coming through Indiana's talent pipeline. The best long-term sources of talent are postsecondary students who pursue and complete degrees or credentials such as apprenticeships that offer entry into a tech career and a bridge to degree attainment.

These degrees and credentials must be accessible, affordable, high-quality and relevant in the increasingly digitized economy. However, Indiana students are trending in the opposite direction, and the state's college enrollment rate is in decline. Only 53 percent of Indiana's 2020 high school graduates chose to enroll in college, down from 65 percent five years ago.[25] These declines jeopardize economic opportunities for students and shrink the already undersized pool of talent needed to fill fast growing jobs.

Indiana Tech Degree Trends

Figure 16 - Source: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS)
Note: Data represent degrees awarded at all Indiana postsecondary institutions. The Short-term Award/Certificate category includes all certificate types, including short-term, long-term, and post-Bachelor's/Master's certificates.

In a bright spot, students are increasingly pursuing and completing tech-related degrees compared to other majors. Computer science and other tech degrees are now among the top five majors at many public and private Indiana colleges and universities.

Tech-aligned degree completions have strong year-over-year growth trends that outpace growth in all other

24. Source: National Equity Atlas, See: Educational Attainment Indicators
25. Indiana Commission for Higher Education, "Indiana College Readiness Report 2022." See: 2022_College_Readiness_Report_06_20_2022.pdf

degrees. However, the bulk of this growth has come from sub-bachelor's degrees, which increased by 10,000 completions since 2012 compared to 5,500 bachelor's and graduate degrees.

Similarly, completions in computer & information sciences & support degrees have strong year-over-year growth trends that outpace growth in all other degrees. Notably, the bulk of this growth has come from bachelor's and graduate degrees, which increased by 2,000 completions since 2012 compared to 470 certificate and associate degrees.

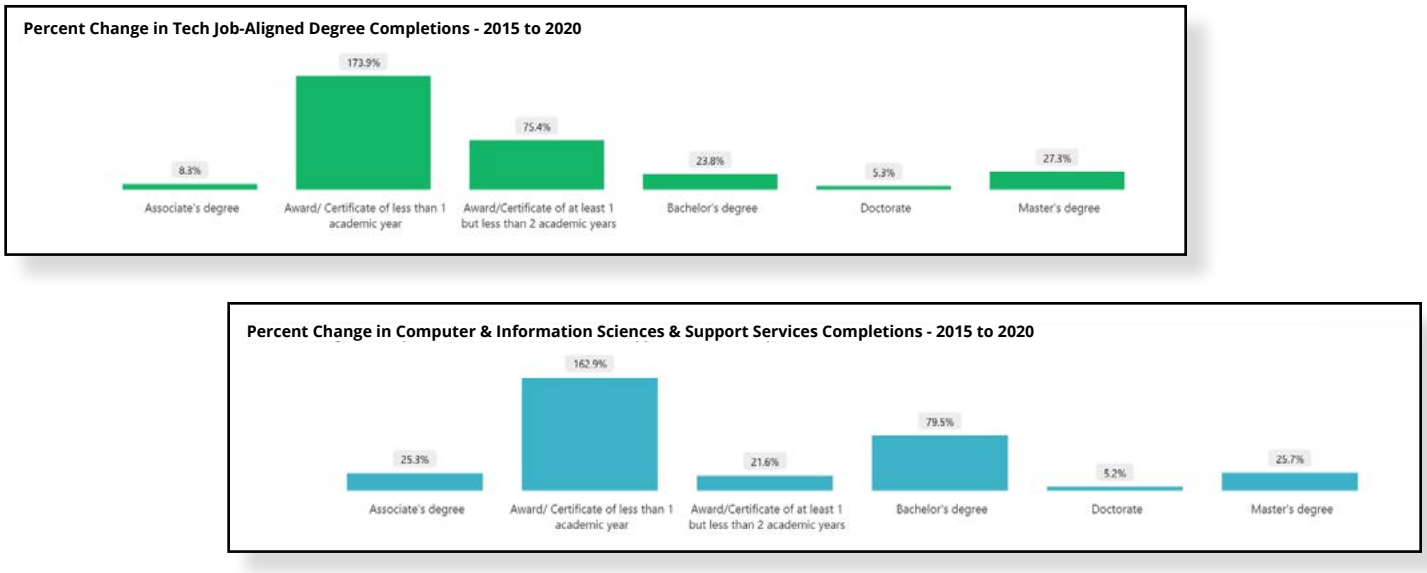
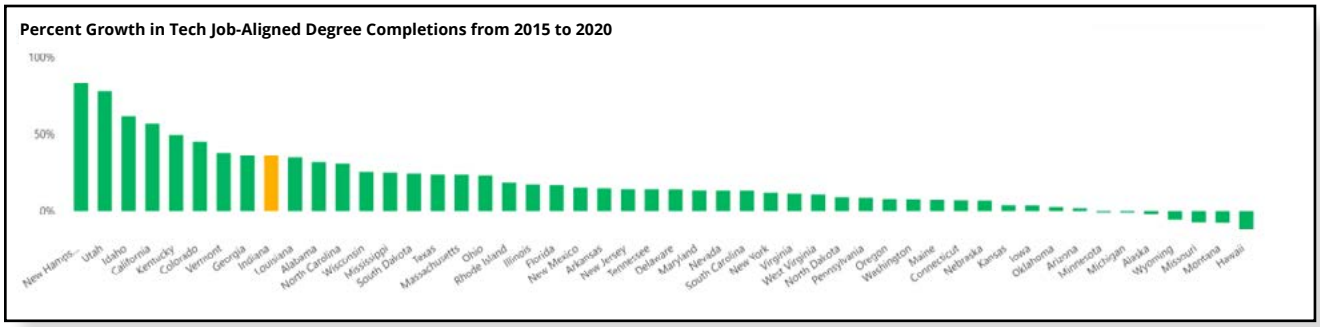


Figure 17 - Source: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS)
Note: Data represent degrees awarded at all Indiana postsecondary institutions. The Short-term Award/Certificate category includes all certificate types, including short-term, long-term, and post-Bachelor's/Master's certificates.

Tech jobs typically continue to require a postsecondary credential. In most cases entry-level tech jobs require a bachelor's degree (16 of the 20 CompTIA tech occupations require bachelor's degree). While this requirement is shifting to a skills-focus, those skills required for a bachelor's degree are in rising demand. Indiana is seeing a strong rise in completion of tech-skilled degrees.

Tech-skilled degree completions have increased since 2015 across all degree levels. This is also true for computer & information sciences & support completions. While bachelor's degrees remain dominant, there has been significant growth in sub-bachelor's degree awards and credit-bearing certificates since 2015. This surge tracks with national completion trends and is not unique to Indiana. It reflects the rising importance of tech roles as part of the overall workforce and demand for degrees that lead directly to long-term positive employment.

Growth in tech-related degrees is occurring throughout the country. Indiana is making positive strides in growing tech completions, which grew by 36 percent from 2015 to 2020 and ranks within the top 10 fastest growing states. Indiana is increasing computer & information sciences & support completions, which grew by 62.6 percent from 2015 to 2020, but is barely in the top half of states by comparison. Indiana has relatively weaker growth rankings in graduate-level degrees, falling in the bottom half of states for master's and doctorate completion growth.



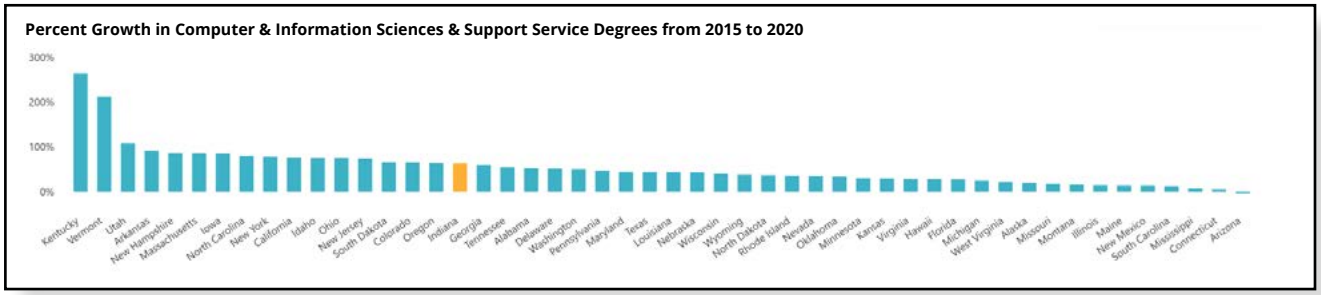


Figure 18 - Source: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS)
Note: Data represent degrees awarded at all Indiana postsecondary institutions.

Indiana's postsecondary students are about as likely to pursue and complete tech-related degrees as students in other states. Indiana ranks above average (15th) in Tech Job-Aligned completions and as a share of all completions. Notably, Indiana has the highest share of short-term award/certificate students completing Tech-Job Aligned programs of study. When looking specifically at Computer & Information Sciences & Support degrees as a share of all completions, Indiana compares slightly above average (21st). Indiana performs relatively well in this metric for bachelor's-level Computer & Information Sciences & Support completions, ranking 12th overall. Indiana's positive growth needs to be significantly higher to sustain and grow the economy and opportunity.

An Insufficient Pipeline to Meet Demand

Tech employer need for degreed talent has continued to set a record pace. Indiana employers posted over 15,000 jobs for bachelor-entry-level jobs in June 2022, or about five times the number of computer and information sciences and support services bachelor's degrees completed at Indiana institutions in 2021.[26] Fewer than 40 percent of bachelor-level graduates with this degree program of study stay and work in Indiana in the year after graduation.[27] The current pipeline of new tech graduates falls well short of the state's tech talent needs.

Percent Share of All Completions at Indiana Postsecondary Institutions

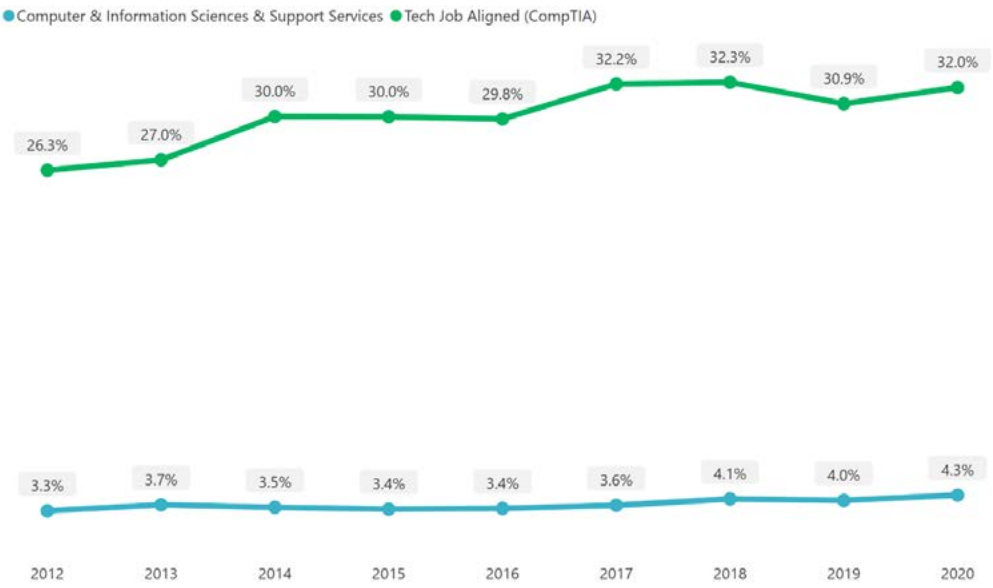


Figure 19 - Source: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS)
Note: Data represent degrees awarded at all Indiana postsecondary institutions.

Unique Monthly Tech Job Postings (ComptTIA) by Typical Entry Level Education

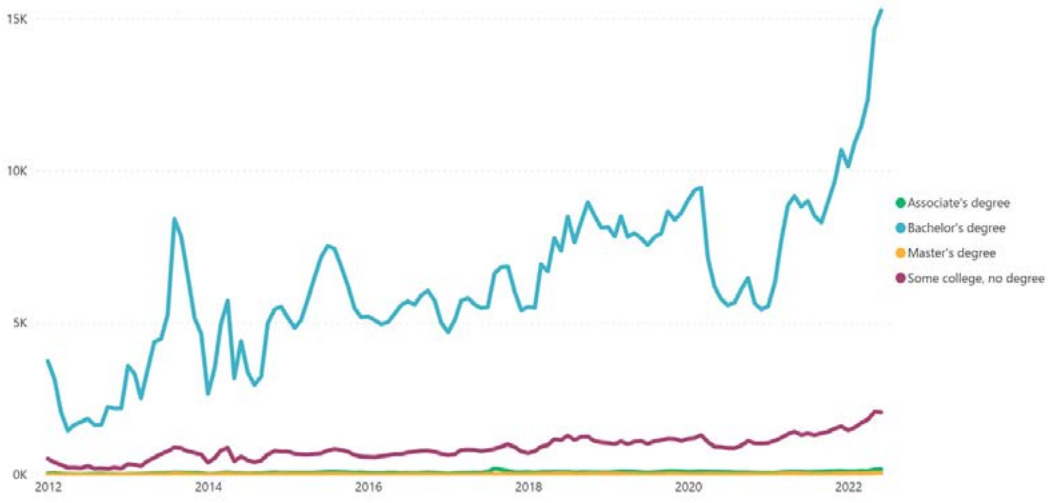


Figure 20 - Source: Lightcast™ Labor Market Analytics & Economic Data, www.economicmodeling.com, 2022

With more than 85 percent of job postings requiring at least a bachelor's degree and fewer than 30 percent of Hoosiers achieving a bachelor's or higher degree, new competency and skills-based pathways must be developed. The evidence shows the tech skills in Indiana's workforce are inadequate. Indiana's workers need to build greater tech competencies and skills to fill available jobs and adapt to accelerating technological changes occurring across industries.

26. Source: Lightcast™ Labor Market Analytics & Economic Data, www.economicmodeling.com, 2022
27. Source: U.S. Census Bureau. Post-Secondary Employment Outcomes (PSEO). See: https://lehd.ces.census.gov/data/pseo_experimental.html#methodology

The Skill Gaps in Talent Development

Job posting and online candidate profile data shed further light on skill gaps in Indiana's tech labor market. Aggregating and comparing skills referenced in unique tech job postings to skills referenced in online candidate profiles, shows the tech skill supply and demand gaps.

Gaps in Technical Software Skills Referenced in Indiana Unique Job Postings (1/18 to 8/22) & Online Profiles

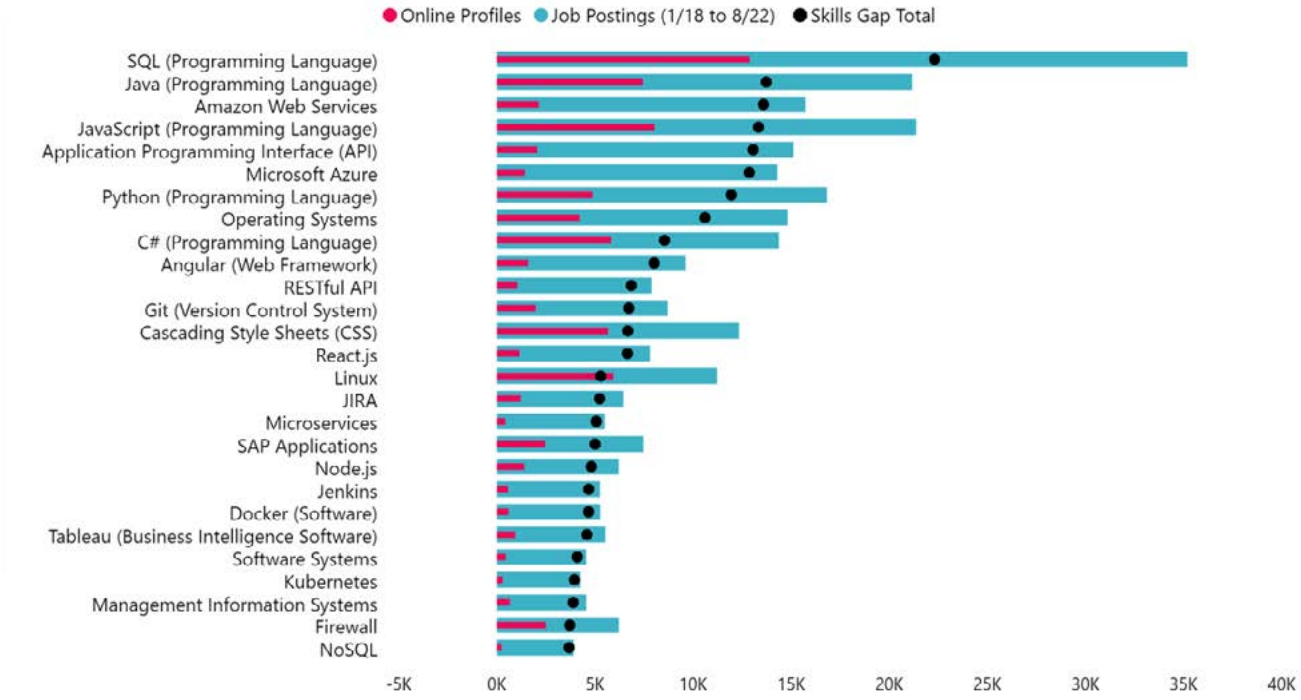


Figure 21 - Source: Lightcast™ Labor Market Analytics & Economic Data, www.economicmodeling.com, 2022

Technical skill gaps are greatest in computer science, agile methodology, and programming languages. Digging a bit deeper into software/programming-specific skills, the largest technical software-specific gaps are SQL and Java programming language skills, with Amazon Web Services following closely behind. With regard to common skills found across industries and occupations (also known as soft skills, human skills, and/or competencies), there are prominent gaps in communications, problem solving, and management.

Indiana is a Top Producer of Tech-Skilled Talent

Indiana benefits from many high-quality postsecondary institutions and is uniquely positioned to capitalize on the stream of talented graduates seeking careers after graduation. Indiana's postsecondary institutions enroll 2.26 non-resident students for every one resident student who enrolls out-of-state. This results in approximately 10,000 additional students relocating to Indiana for postsecondary education, making Indiana a lead net importer of postsecondary students (5th largest state for net student migration).[28]

It is especially critical that tech employers make every effort to recruit and employ these graduates within Indiana's borders. Using Census data (PSEO) to track graduate employment outcomes within Indiana and across borders sheds additional light on computer and information science graduates. It's clear these graduates are leaving Indiana after graduation in large numbers for employment.

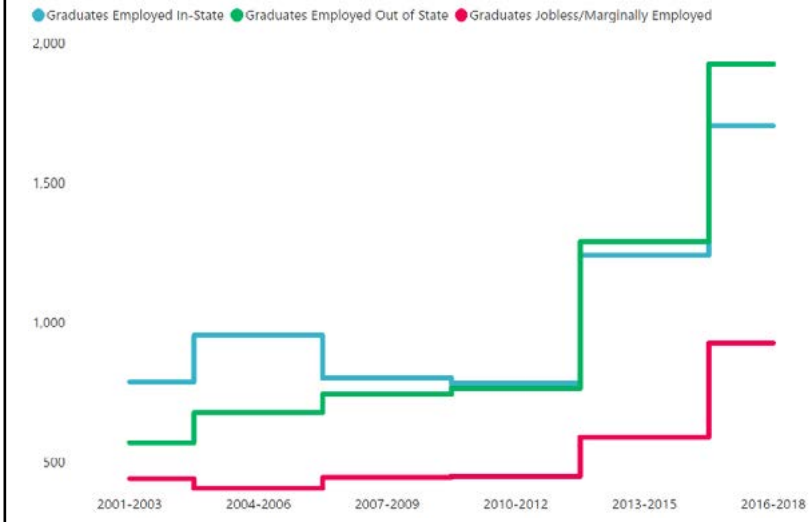


Figure 22 - Source: U.S. Census Bureau. Post-Secondary Employment Outcomes (PSEO). See: https://lehd.ces.census.gov/data/pseo_experimental.html#methodology

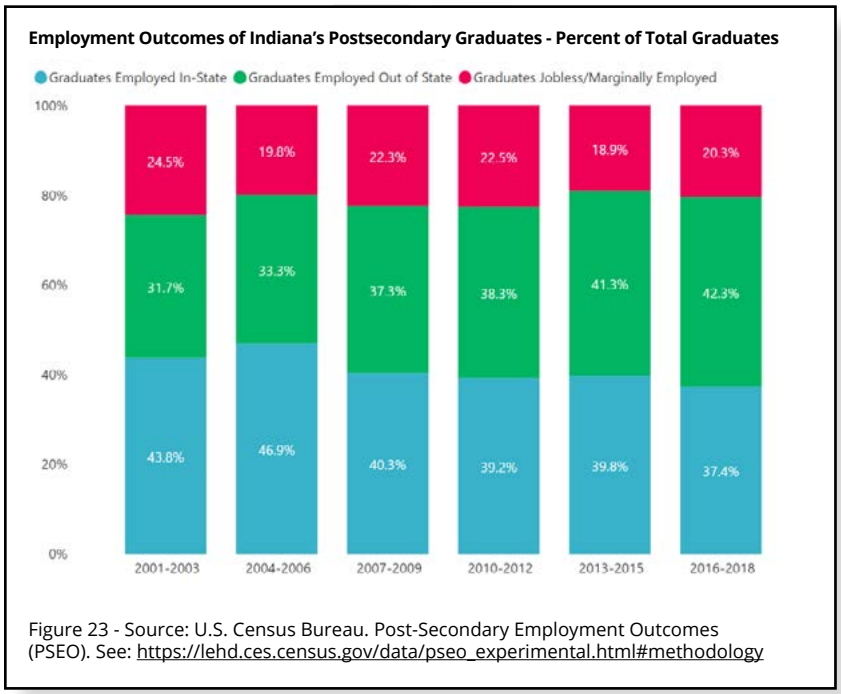


Figure 23 - Source: U.S. Census Bureau. Post-Secondary Employment Outcomes (PSEO). See: https://lehd.ces.census.gov/data/pseo_experimental.html#methodology

In general, students graduating with higher degree levels are more likely to leave Indiana than to remain. As years after graduation increase, graduates are more likely to leave Indiana and reside/work elsewhere. Before tech employers undergo the expensive, often time-consuming cost of recruiting out-of-state prospects, they should look first to the many students in Indiana's educational institutions who are actively or will soon be searching for jobs.

28. Source: IPEDS Data Explorer, Table 4. Number of first-time degree/certificate-seeking undergraduate students enrolled, residence, and migration at Title IV institutions, by state or jurisdiction: Fall 2020. The Integrated Postsecondary Education Data System

Indiana is Producing STEM Talent at a Leading Rate

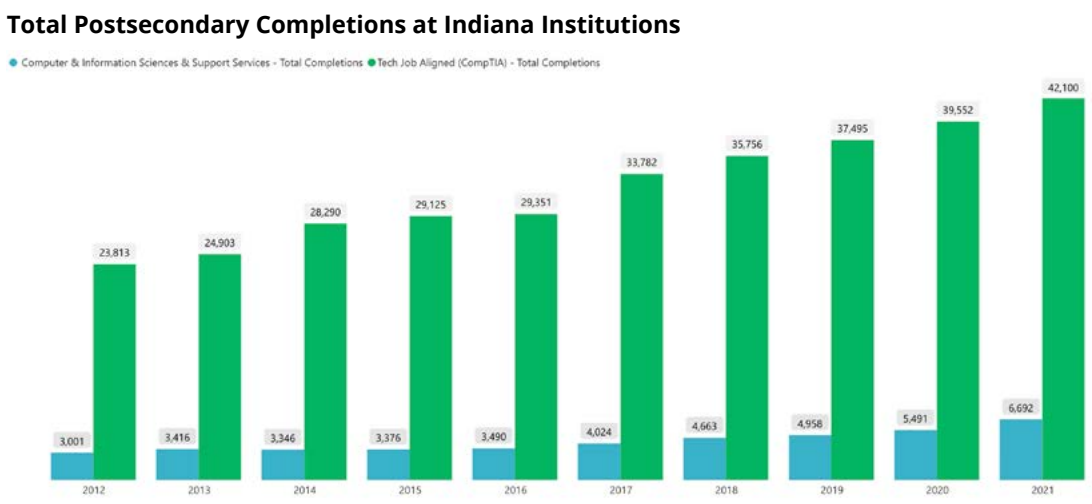


Figure 24 - Source: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS)
Note: Data represent degrees awarded at all Indiana postsecondary institutions. The Short-term Award/Certificate category includes all certificates types, including short-term, long-term, and post-Bachelor's/Master's certificates.

Indiana is Not Retaining the Top Tech Talent its Educational Institutions are Developing

Indiana is losing tech graduates to other states in high numbers. Statewide, Indiana retains only 38.7 percent of its tech graduates. These tech graduates most commonly go to Chicago, San Francisco, New York, Washington DC, Dallas and Los Angeles. Tech workers in these metro areas are strong recruitment candidates.

But We are Not Retaining our Talent

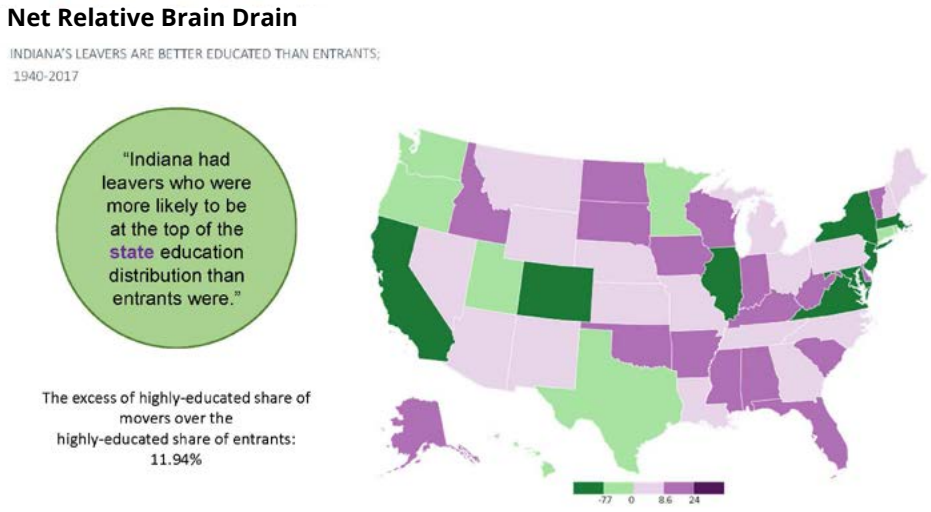


Figure 25 - Source: "Losing Our Minds," https://www.jec.senate.gov/public/index.cfm/republicans/analysis?ID=581865E8-F994-44C1-AD45-48644F31E624

Tech Workers Who attended an Indiana Postsecondary Institution by Current MSA

Figure 26 - Source: Lightcast™ Labor Market Analytics & Economic Data, www.economicmodeling.com, 2022

Where we Might Gain Talent

Metro areas with more tech graduates than available jobs are also good sources of early-in-career talent. By comparing postsecondary graduate data with estimated tech job openings for each metro area, we can estimate where new graduates might struggle to find local work.

Under this analysis, Los Angeles, New York, Miami, Chicago and Phoenix appear to have the largest surplus of tech graduate talent. Tech employers should consider looking to postsecondary institutions in these regions to recruit new, out-of-school talent.

Postsecondary Tech Graduate Oversupply

Figure 27 - Source: Lightcast™ Labor Market Analytics & Economic Data, www.economicmodeling.com, 2022

Tech is a Major Driver for Indiana Economic and Wage Growth

IT/Tech services and telecommunications industries together generate nearly $11 billion in Indiana GDP. However, IT/Tech services industries employ nearly three times as many Hoosiers as the telecommunications industries and generates three times more GDP Earnings (includes wages, salaries, supplements, and proprietor income) compared to telecommunications industries.

The tech industry is generally becoming a larger percentage of Indiana's economy over time. At the statewide level, tech industries have accounted for about 4 percent of Indiana's total GDP since 2010. By contrast, tech industries account for 7.2 percent of GDP for Marion County and 6.3 percent for the Indianapolis MSA. These figures indicate the tech industry is more concentrated in the central Indiana MSA and Marion County.

Tech Industry GRP Earnings

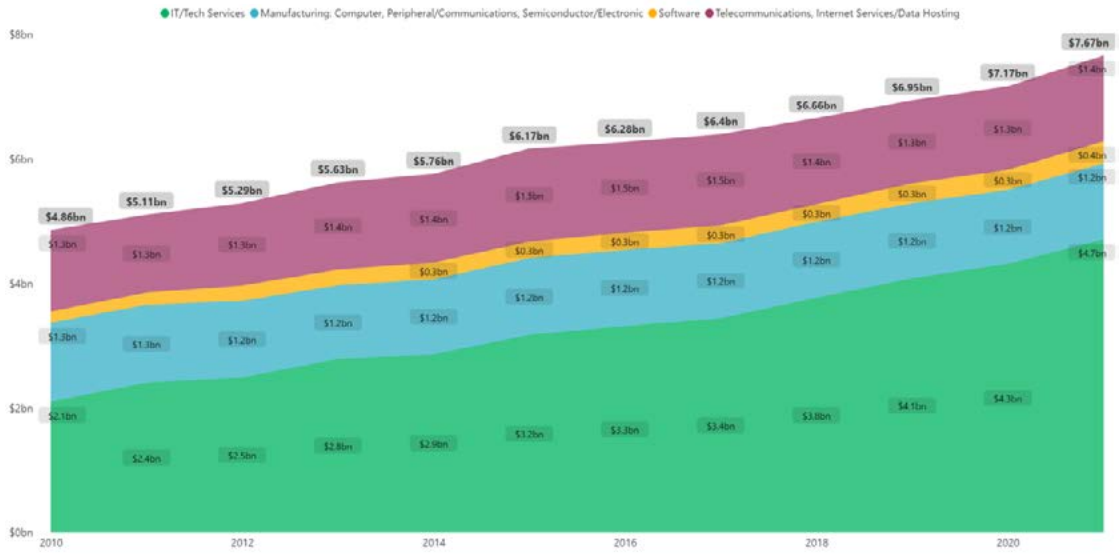
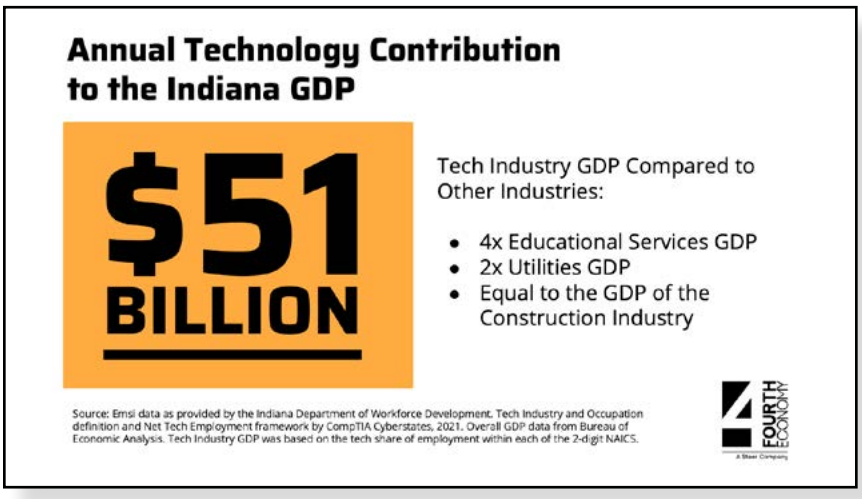


Figure 28 - Source: Lightcast™ Labor Market Analytics & Economic Data, www.economicmodeling.com, 2022

Technology and tech-skilled workers are now essential economic growth catalysts across all sectors. The ability to attract, develop and retain talent is a key driver of GDP across all of Indiana's core industry verticals, including healthcare and life sciences, advance manufacturing and logistics, and agriculture.

Across all sector's the tech industry and workforce now contributes $51 billion annually to Indiana's GDP.

For every 10,000 tech and tech-related jobs added to the Indiana workforce, Indiana gains an average of $698 million in wages and $103 million in state and local taxes. Tech is a current and future pillar of Indiana economic strength and provides meaningful employment for Hoosier families.



Indiana Benefits from Additional Tech Growth

For every 10,000 new tech workers

$698 MILLION

ANNUAL WAGES

Source: Emsi data as provided by the Indiana Department of Workforce Development. Tech Industry and Occupation definition and Net Tech Employment framework by CompTIA Cyberstates, 2021. Overall workforce data from BLS Quarterly Census of Employment and Wages

$56.7 Million
Personal Taxes
Including personal income taxes and sales taxes

$22.5 Million
Income Taxes
3.23% of wages

$34.2 Million
Sales Taxes
Sales Taxes 7% of discretionary spending
(70% of wages)

FOURTH ECONOMY
A Steer Company

Recommendations

1. Promote broader and faster adoption of digital technologies through comprehensive and systematic solutions and policies designed to develop, attract and retain and employ skilled tech workers across all sectors in Indiana.

- Take a multi-pronged approach to meeting employer demand for tech-reliant talent, by advancing resident worker skills, retaining college graduates, developing robust non-degree pathways and opening doors for global talent pipelines.
- Promote early exposure programs, work-based learning experiences, aligned advising and early career pathways into tech and tech-reliant roles. Early career pathways should be stackable and aligned with future education and training opportunities to create clear, robust pathways for future career progression.
- Develop and adopt specific solutions to address historical barriers to entry for under-represented, under-supported groups.
- Create incentives for talent developed in Indiana to stay and work in Indiana. National data suggests that a targeted, employer-side student loan repayment program could be especially effective.
- Refine Indiana tax policies and incentives to support both Indiana attraction of remote workers and employer hiring of remote talent in critical demand areas.
- Advocate for means of counter-balancing Indiana's declining working-age population, such as employment-based immigration reform.

2. Establish both state-wide and sector-led scalable systems for developing talent, aligning supply and demand, and supporting both talent and employers.

- Promote adult apprenticeship as a robust and stackable pathway to careers in tech. Expand and scale the TechPoint model to offer a robust state-wide system of adult apprenticeship for skilling, re-skilling and up-skilling in tech and tech-reliant roles.
- Encourage and support employers and talent developers to adopt a skill-based approach to hiring, developing and retaining talent.

3. Provide regular tech workforce reports and analyses to ensure employers, educators and talent developers, government partners and community organizations establish program and policy goals and actions based on clear and consistent data and understanding of the tech and innovation workforce ecosystem.

Glossary

The following terms and concepts apply throughout this report. All except "Tech Job-Aligned Degrees" and "Computer and Information Science and Support Services Degrees" are provided verbatim from the Lightcast Glossary web page.

CIP-to-SOC Mapping

The CIP-to-SOC mapping connects educational programs with target occupations, showing potential higher ed talent pipelines into occupations. Emsi's CIP-to-SOC mapping is based on the National Center for Education Statistics' CIP-to-SOC mapping. Emsi has made modifications to the mapping to make it more useful.[29]

Computer and Information Science and Support Service Degrees

According to IPEDS, these degree programs are "Instructional programs that focus on the computer and information sciences and prepare individuals for various occupations in information technology and computer operations fields." These degrees focus on computer-and information technology-oriented areas of study.

Degree Completions

The number of degrees or certificates conferred for a specific course of study in a given year. Includes all award levels. May be greater than the actual number of students who graduated, as Emsi includes both primary and secondary majors. Both primary and secondary majors are included because a graduate with a dual major in mathematics and electrical engineering should be considered part of the potential supply for occupations that map to both majors. The reference period for a completion year is July 1 of the prior year through June 30 of the current year.[30]

Employed

In Emsi data, employed refers to any person who is currently paid as an employee or is self-employed. It is important to note that Emsi employment counts jobs, not people.

Hires

The number of hires for the selected timeframe. When compared with Unique Postings, Hires shows how much actual hiring activity there is relative to the amount of posting activity. A hire is reported by the Quarterly Workforce Indicators when an individual's Social Security Number appears on a company's payroll and was not there the quarter before. The QWI program produces a comprehensive tabulation of employment and wage information for workers covered by State unemployment insurance (UI) laws, similar to the QCEW program. For more information from the Census Bureau on how hires data is collected, see this publication. For more information on how Emsi calculates hires for occupations, see the methodology article.[31]

Industry

A group of businesses that produce similar goods and services, and share similar production processes for creating the goods and services they sell. Industries are classified using NAICS codes. Note that in the NAICS system, what a business produces is given less importance than the process used to create it. See NAICS.

29. Source: NCES.
30. Source: NCES, IPEDS.
31. Source: Quarterly Workforce Indicators (QWI) from the Census Bureau and Emsi's proprietary employment data

Industry Projections

Emsi projects employment data 10 years into the future. Industry projections are built from Emsi's final industry data, which is based on the BLS's Quarterly Census of Employment and Wages (QCEW) dataset.[32] See this article for a more thorough treatment of Emsi's industry projections methodology.

Job

A job is any position in which a worker provides labor in exchange for monetary compensation. This includes those who work as employees for businesses (a.k.a. "wage and salary" employees) and proprietors who work for themselves.

Emsi reports employment as annual averages. The exception is the Extended Proprietors Class of Worker (Class 4), which counts proprietors that existed at any time during a given year, because those data are based on tax returns. Employment averages represent jobs, not workers, since one individual may hold multiple jobs.

Due to limitations of source data, both full- and part-time jobs are included and counted equally, i.e., job counts are not adjusted to full-time equivalents.

Geographically, payroll jobs are always reported by the place of work rather than the worker's place of residence. Conversely, self-employed and extended proprietors are always reported by their place of residence. Unpaid family workers and volunteers are excluded from all Emsi data.[33]

Job Projection Methodology

Emsi Burning Glass provides projected employment values, by industry and occupation, for the next 10 years from the current year. These projections are built under the assumption that past trends continue unchanged into the future. We first project industry employment data, and then adjust the projection trends to data from the BLS Employment Projections program. We then calculate occupation projections by multiplying these projected industry values by projected regional staffing patterns.

It is clear that the recent pandemic-induced recession has had and will continue to have a large and diverse impact on industry and occupation employment. While neither Emsi Burning Glass nor the BLS have changed projection methodologies to include assumptions about the changing economy in the wake of the recession, the BLS continues to evaluate the assumptions underlying their methodology.[34]

Occupation

The term occupation refers to professions or careers in the workforce. In Emsi data, occupations are differentiated from jobs, as jobs show the count of positions held within a certain occupation. For example, Health Educators would be considered an occupation; in a report focused on the Minneapolis-St. Paul-Bloomington, MN MSA, there might be 970 currently held jobs for Health Educators.

32. Source: Emsi data based primarily on the Quarterly Census of Employment and Wages (QCEW) from the Bureau of Labor Statistics (BLS) and the Bureau of Economic Analysis (BEA).
33. Sources: QCEW
34. For further information see: Does Emsi Burning Glass account for the COVID pandemic recession in employment projections? – Knowledge Base (emsidata.com) and Why Don't Emsi Burning Glass Projections Match BLS or State Projections? – Knowledge Base (emsidata.com)

Openings (Job Openings)

A combination of both new jobs and replacement jobs constitutes total openings. The annual openings figure is derived by dividing total openings by the number of years in the user's selected timeframe.[35] For example, an occupation showing 130 openings between 2016 and 2026 would result in an annual openings figure of 13. For more information on how Openings is calculated, see this article.

Program / Program of Study / Area of Study/ Degree Program

Emsi data uses the term program in reference to select courses offered at accredited colleges or universities. Programs are oriented toward a specific occupation, and completion of these programs is often signified by a specific award level, such as Baccalaureate, Master's, and Doctorate degrees.

Skills

In Lightcast data, skills are competencies at specific tasks or familiarity with specific subjects and tools acquired through education or experience. See: Skills – Knowledge Base (emsidata.com)

- Technical ("Specialized") Skills: Skills that are primarily required within a subset of occupations or equip one to perform a specific task (e.g. "NumPy" or "Hotel Management"). Also known as technical skills or hard skills.
- Foundational ("Common") Skills: Skills that are prevalent across many different occupations and industries, including both personal attributes and learned skills. (e.g. "Communication" or "Microsoft Excel"). Also known as soft skills, human skills, and competencies.
- Certificate: Recognizable qualification standards assigned by industry or education bodies (e.g. "Cosmetology License" or "Certified Cytotechnologist").

Standard Occupation Classification (SOC)

The Standard Occupational Classification (SOC) system is used by Federal statistical agencies to classify workers into occupational categories for the purpose of collecting, calculating, or disseminating data. All workers are classified into one of about 775 detailed occupations according to their occupational definition. To facilitate classification, detailed occupations are combined to form about 450 broad occupations, about 95 minor groups, and 23 major groups. Detailed occupations in the SOC with similar job duties, and in some cases skills, education, and/or training, are grouped together.

The SOC system uses hyphenated codes to divide occupations into four levels: major groups, minor groups, broad occupations, and detailed occupations.

- 29-0000: Healthcare practitioners and technical occupations (major group) 29-1000: Health diagnosing and treating practitioners (minor group)
- 29-1020: Dentists (broad occupation)
- 29-1021: Dentists, general (detailed occupation)

The SOC classification system was updated in 2010, and the update to the 2018 classification is currently

35. Source: Emsi's proprietary employment data, combined with occupation-specific percentages from the U.S. Bureau of Labor Statistics Employment Projections program.

happening across various government LMI datasets. For more information on Emsi's use of SOC codes (including departures from the standard classification), see this article.

Tech Industries

Tech industries referenced in this report refer to the industries listed on the right of this page. These Industries directly correspond to the 2022 CompTIA "State of the 2022 Tech Workforce" report found here. Similarly, each individual industry is grouped into one of the four "Tech Industry Groupings" as displayed on this page. Tech industry groupings also directly align with CompTIA grouping assignments. CompTIA provides the following considerations on defining and analyzing technology industries (see page 155 of full report), which equally apply to our report:

"There are a number of considerations when developing a definition of the technology industry. In some cases, NAICS codes do not perfectly reflect industry dynamics. This can be especially challenging in times of rapid innovation, when new tech sectors emerge in a short period of time. More recently, the degree to which technology has become core to so many industry sectors poses new questions. For example, a technology platform designed to facilitate the online sale of goods may have traditionally been viewed as a retailer, although given the intense use of technology, an argument could be made to classify it as a technology firm.

Conceptually, this report focuses on the sectors involved in making, creating, enabling, integrating, or supporting technology, whether as a product or service. At this time, the report does not include industry sectors categorized primarily as users of technology."

Tech Job-Aligned Degrees

These degree programs include any degree program of study that aligns with CompTIA tech occupations (see glossary "Tech Occupations"). Degree program alignment is determined by the IPEDS CIP SOC Crosswalk. Any degree program that crosswalks to a CompTIA tech occupation is included in this list. These degree programs include Computer and Information Science and Support Services degrees and many other degree programs that crosswalk to CompTIA tech occupations.

Tech Occupations

Tech occupations referenced in this report refer to the occupations listed on the right of this page. These occupations directly correspond to the 2022 CompTIA "State of the 2022 Tech Workforce" report found here.

SOC Code	Occupation Title
11-3021	Computer and Information Systems Managers
15-1211	Computer Systems Analysts
15-1212	Information Security Analysts
15-1221	Computer and Information Research Scientists
15-1231	Computer Network Support Specialists
15-1232	Computer User Support Specialists
15-1241	Computer Network Architects
15-1242	Database Administrators
15-1243	Database Architects
15-1244	Network and Computer Systems Administrators
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
15-1299	Computer Occupations, All Other
15-2051	Data Scientists
15-2099	Mathematical Science Occupations, All Other
17-2061	Computer Hardware Engineers
49-2011	Computer, Automated Teller, and Office Machine Repairers

CompTIA provides the following considerations on defining and analyzing technology occupations (see page 155 of full report), which equally apply to our report:

"For occupation-level analysis, this report utilizes the Standard Occupational Classification (SOC) System, which is a standard used by federal agencies to classify workers into occupational categories."

Typical Entry Level Education

The education level most often needed to enter an occupation. Typical entry-level education is reported at the national level, so alternate paths to employment may exist in a region of study. See: BLS' Education and training assignments by detailed occupation.

Unemployed

An estimate of total unemployed persons by industry or occupation in a region. Emsi uses LAUS as the basis of its unemployment data, which uses a definition of unemployment roughly equivalent to U3, the most widely used measure.

Unique Job Postings

Unique Job Postings is the number of deduplicated job vacancy advertisements scraped from over 45,000 websites. Deduplication is the process of identifying duplicate job postings and only counting one of the duplicates. The unique posting count is the count of postings after the deduplication process has taken place. The total posting count is the count of postings before deduplication. For example, if a user runs a report that returns 12 total job postings and 2 unique job postings, this means that the 12 postings contained 10 duplicates and only 2 unique job advertisements.

ABOUT

TECHPOINT

TechPoint is the industry-led growth initiative for Indiana's digital innovation economy and overall tech ecosystem. Our team is focused on working with public, private and industry partners across all sectors to expand the tech talent pipeline, enhance resource connectivity for enterprise organizations and startups alike, and elevate the industry by activating the community and amplifying stories of success.

Talent Initiatives

- Skills-Based Hiring
- Apprenticeships
- Xtern | Internships
- Leadership Academy
- Careers in Tech

Innovation Initiatives

- Venture Support
- Venture Connect
- VCI Marketplace
- Indiana CIO Network
- Capital Research

Membership

- Community Connections
- Board Representation
- Innovation & Talent Councils
- Public Relations as a Service (PRaaS)

Get Involved

- To learn more about the above initiatives and TechPoint events, visit **techpoint.org**.
- List your inclusivity-focused employment benefits in a dedicated company profile on our **Tech Directory**.
- Post your job openings to the **TechPoint Job Board**.
- **Take the Mission41K pledge** to help inclusively grow the Indiana tech workforce.
- Subscribe to the **TechPoint Index**.
- Follow us on social media - **@TechPointInd**