



  
GREATER PHOENIX CHAMBER  
**FOUNDATION**

# Workforce Analysis Cybersecurity/IT Summer 2023

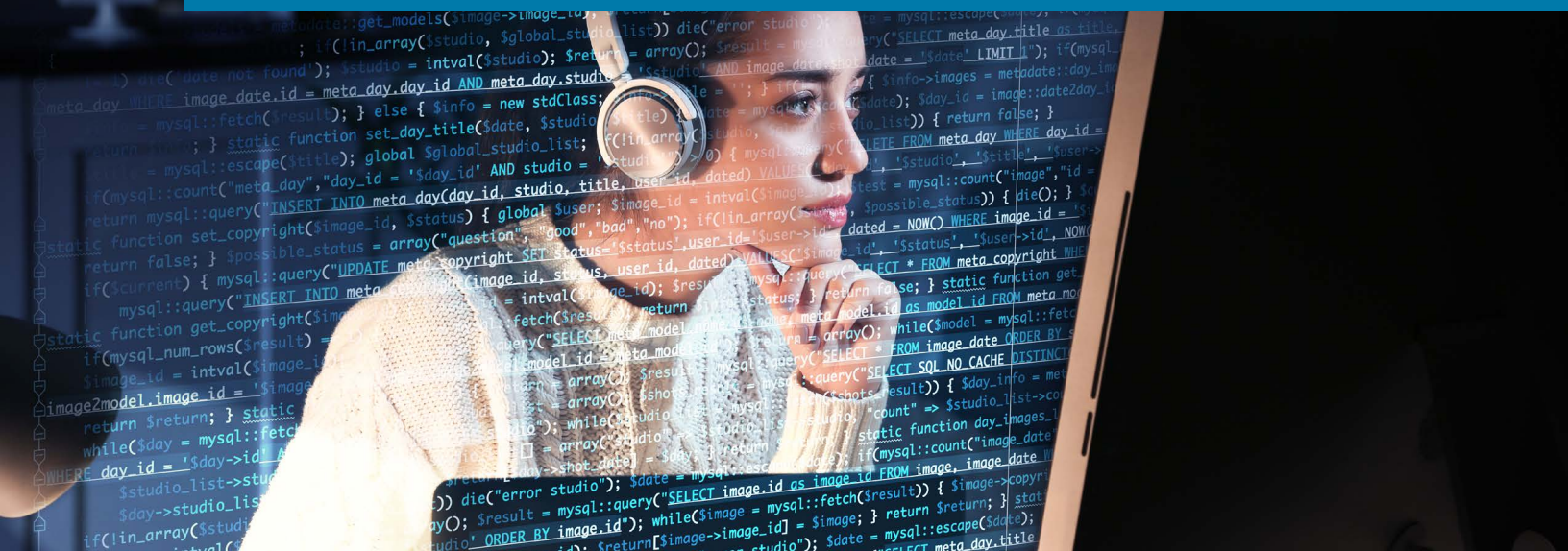


# Table of Contents

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Introduction.....	1
Analysis Methodology.....	1
Research Limitations.....	1
The Cybersecurity/IT Industry.....	5
Employment in Cybersecurity/IT.....	5
Occupations in Cybersecurity/IT with High-demand and High-wages.....	7
Highlighting Educational Programs Preparing Arizona’s Advanced Cybersecurity/IT Workforce.....	10
Key Findings.....	14
Recent Cybersecurity/IT Progress.....	15
Conclusions.....	17

**This report is one industry of a larger analysis covering five target industries: construction, cybersecurity/IT, financial services, healthcare, and manufacturing.**



# Introduction

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The Greater Phoenix region is a leader in the development of the state's economy and has become a notable leader across the nation as a whole. The state has become a destination for not only new residents, but for new businesses as well. Workforce quality, availability, and cost effectiveness are keys to maintaining this momentum.

Rounds Consulting Group ("RCG") partnered with the Greater Phoenix Chamber Foundation ("Foundation") to perform a workforce summary of key target industries including a "high-level" review of supply and demand opportunities and constraints. The analysis examined multiple data points from various sources in order to determine if the supply of labor in the target sectors is expected to meet the demand. The five target industries include: Manufacturing, Construction, Healthcare, Financial Services, and Cybersecurity/IT.

## Analysis Methodology

Within the analysis, employment projections from the Arizona Office of Economic Opportunity ("OEO") were used to determine the number of jobs that are expected to be demanded by either industry sub-sector or occupation within the given industries over the next 10 years. Information was then collected related to the educational requirements needed for entry into each occupation or industry sub-sector.

The information was analyzed and displays the total number of jobs that will be demanded by industry sub-sector or occupation at each educational attainment level (i.e., requiring a high school diploma, associate's degree, bachelor's degree, etc.). The statistics were then compared to degrees awarded, graduation rates, post-secondary education outcomes, and retention rates, among other data, from the Arizona Department of Education ("ADE") and the Arizona Board of Regents ("ABOR").

These figures were combined with projected population inflow data to determine the overall workforce supply that is expected in Arizona over the next 10 years. The information is presented from top to bottom. In other words, the broader industry data is presented first followed by more detailed occupational data and detailed information about degrees awarded.

The gap between supply and demand that was identified provides an insight into the strengths and weaknesses in the state's workforce and education pipeline. This information can also serve as a high-level guide in forming public policy recommendations and decisions.

## Research Limitations

This research analysis is subject to certain limitations arising from the limited availability of data and the classification of the available data. These limitations should be taken into consideration when interpreting and generalizing the findings of this high-level analysis.

First, the entire scope of degrees awarded by all of the state's universities and colleges is limited and can vary among the institutions and regions. Variations in data collection methods, reporting, and disclosure policies may contribute to gaps or discrepancies in the information obtained. Furthermore, predicting the industry that specific graduates will enter upon earning their degree is a challenging task due to the dynamic nature of the job market and evolving industry trends. Factors such as individual preferences, market demands, technological advancements, and economic conditions greatly influence the career choices made by graduates, making it difficult to make precise projections. Consequently, the research outcomes may not represent the entire landscape of degrees or the industries in which graduates will enter; therefore, caution should be used when interpreting the information related to university and college degrees.

## Introduction

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Secondly, there are two standard classification systems of the available data regarding employment counts, occupations, wages, and projections utilized by both the federal and local governments: the North American Industry Classification System (“NAICS”) and the Standard Occupational Classification (“SOC”).

NAICS and SOC are distinct classification systems designed to categorize different aspects of employment data. NAICS primarily focus on classifying establishments and industries based on the primary activity of a business – while SOC classifies occupations based on job duties, skills, and qualifications across various industries. The differences in the classification framework and criteria make it difficult to cross-reference and reconcile the data between the two systems.

Furthermore, the NAICS and SOC systems have different hierarchical structures. The NAICS system organizes industries into hierarchical levels based on broad economic sectors, industries, and sub-industries. While the SOC system classifies occupations into hierarchical levels based on broad occupations and detailed occupations within the broader group.

Utilizing NAICS data provides insights into industry trends or sector-specific research. However, caution should be used when analyzing the industry’s workforce as several varying occupations can be employed at establishments that are classified under similar industries. SOC data should be used when analyzing occupations with similar skills, job duties, and education. However, the workers in the occupational groups can be employed in various industries.

While cross-referencing NAICS data with SOC data presents its challenges due to the differing classification systems, both are valuable resources and analyzed in this report. Further NAICS and SOC definitions and information regarding the classifications are summarized in the following table.

Due to the research limitations, it is essential to interpret and utilize the findings of this research with caution. The intent of this disclosure is to ensure transparency and promote a responsible understanding of the scope and implications of the research conducted for this assignment. It is recommended that further research by industries employing more extensive data collection methods should be considered to enhance the validity and reliability of the findings.

For any inquiries or clarifications regarding this disclosure statement or the research conducted, please feel free to contact RCG or the Foundation.

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# Introduction

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## Table 1: NAICS and SOC Definitions and Classifications

### North American Industry Classification System - NAICS

NAICS employment and payroll data is based on survey information collected from establishments (i.e., employers). The establishments are grouped into industries according to similarity in the processes used to produce goods or services.

For example, a semiconductor manufacturing company would be classified under the broader manufacturing industry (i.e., NAICS 31-33) and the semiconductor and related device manufacturing sub-industry (i.e., NAICS 33-4413).

Although the sub-industry is comprised of establishments primarily engaged in similar activity, the employment and payroll data include occupations of all types such as management professionals, accountants, human resource managers, engineers, production workers, janitorial staff, etc.

### Standard Occupational Classification - SOC

The SOC system classifies occupations based on their job duties, skills, and qualifications. It encompasses a wide range of occupations across various industries and sectors. Each broad occupational group is further broken down into detailed occupations, representing specific job titles and roles.

Examples of detailed occupations within the broad occupational “nurse” group include registered nurses, nurse anesthetists, nurse midwives, nurse practitioners, etc. Nurses, however, can be employed across different industries such as the ambulatory healthcare services industry, hospital industry, nursing and residential care industry, and the social assistance industry.

The SOC system is widely used for various purposes, including labor market analysis, workforce policy development, and research on occupational trends. The data is compiled through collaboration with government agencies, subject matter experts, employers, and labor market analysts as well as various surveys.

Source: U.S. Census Bureau; U.S. Bureau of Labor Statistics

# The Cybersecurity/IT Industry

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Arizona has positioned itself as a leader in the cybersecurity and information technology industry (“high-tech industry”). The state’s ecosystem – which includes access to a large talent pool and collaborative efforts with the state’s three research universities, a robust infrastructure network, government initiatives, and a business-friendly environment – has helped attract high-tech businesses to Arizona, as well as encouraged entrepreneurship, fostering growth from within.

Specifically, the state offers specialized workforce development programs and supports entrepreneurship and innovation at the state’s universities, research parks, and business incubators. The local community colleges and training institutes also offer high-tech and workforce programs to support the future talent pool.

Furthermore, the state has the necessary reliable infrastructure, offering high-speed fiber internet connectivity, consistent and reliable power coverage, and access to an efficient transportation system with a low risk of natural disasters. The region has created a robust network of data centers and continues to attract new high-tech businesses.

Arizona also has a favorable business environment for high-tech businesses, with available tax incentives, supportive government policies, manageable regulations, and extensive business development efforts with the state’s economic development organizations.

Over the years, Arizona has attracted scores of the leading high-tech companies from around the world. The high-tech industry has become one of the state’s largest high-paying sectors. A few of Arizona’s high-tech industry leaders include companies such as GoDaddy, Intel, Norton LifeLock, IBM, Honeywell, Raytheon, McKesson, BeyondTrust, ClearData, and Early Warning, among many others.

The military base in Southern Arizona, Fort Huachuca near Sierra Vista, is a leader in cyber defense and is the headquarters of the Network Enterprise Technology Command’s (“NETCOM”) 9th signal command. The army base also contains the U.S. Army Intelligence Center of Excellence program, which provides military personnel with the training and skills necessary to provide intelligence and support all cyber operations in the department of defense and the army.

The not-for-profit Arizona Cyber Threat Response Alliance (“ACTRA”) was created in response to the growing threats of cybercrime in the state, and protects the state’s security networks, internet infrastructure, and supply chain through empowering our Member Organization to empower themselves. ACTRA’s goal is to deliver timely, cost-effective, actionable individual, and/or collective response to protect individual organization assets, improve our national security, and avoid any unnecessary “info silos”.

The Arizona Cybersecurity Team (“ACT”) is another key organization contributing to Arizona’s development of the high-tech industry. The ACT focused on creating the blueprint for the state during the former governor’s administration, engaging public and private sectors to increase public awareness, sharing best practices of cybersecurity, and strengthening the cybersecurity workforce development and education system. Today those recommendations have been acted upon or remain in the process of being acted on to ensure the execution of the vision.

With the support of these organizations, Arizona has built the foundation to become one of the nation’s premier cybersecurity and technology centers. However, there are still critical goals that will need to be addressed such as increasing the talent pipeline within the industry to help reduce the current workforce shortages.

# The Cybersecurity/IT Industry

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## Employment in the Cybersecurity and IT Industry

It is important to note for this section, the cybersecurity and IT industry does not have its own NAICS code. The industry is included as a portion of the information (as defined under NAICS 51) and the other portion is included with professional scientific and technical services (as defined under NAICS 54). Therefore, when calculating the share of GDP of the high-tech industry, a portion of the percentage is produced by industries outside cybersecurity and IT.

The combination of the two NAICS results in a 9.8% share of the state's GDP. The NAICS includes publishing industries, motion picture and sound recording, broadcasting and telecommunications, and data processing, hosting, and other information services. The professional scientific and technical services NAICS includes computer systems design and related, architectural services, scientific research, and advertising, among others.

According to the Arizona Office of Economic Opportunity ("OEO"), the cybersecurity and IT industry (as defined under SOC 15-12002) employed 3.7% of the total statewide workforce as of 2022 (see figure 1). This is compared to the national cybersecurity and IT industry which represented 3.3% of the total national workforce in 2022, according to the United States Bureau of Labor Statistics ("BLS").

Because the cybersecurity and IT industry produces higher wages than average and creates opportunities that benefit local businesses, the overall impacts that the industry has on the state's economy are even greater.

Although Arizona has already surpassed the national share of employment within the industry, the region can still grow significantly within this industry. The level of employment in the industry within Phoenix Metropolitan Statistical Area ("MSA") in comparison to select MSA's (i.e., Los Angeles, Boston, Seattle, and San Francisco) provides insight that Phoenix has the lowest level of employment, according to data from the U.S. BLS. This evidence suggests that there is room for the industry to grow in Arizona.

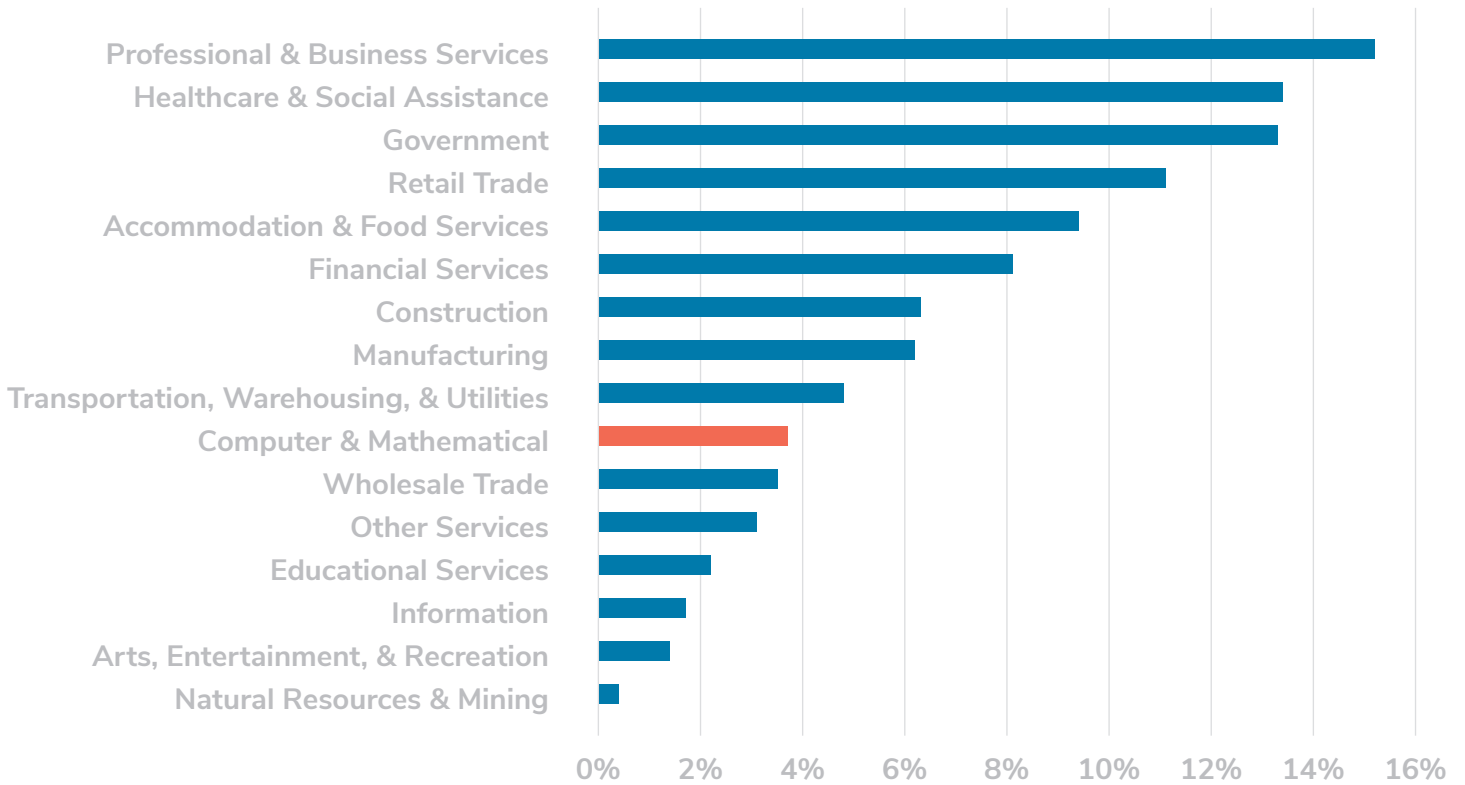
The cybersecurity and IT industry is facing a labor shortage which reinforces that there is room for growth that will come from closing this gap. If the state is able to diminish the labor shortage in the industry by increasing the number of graduates each year, the overall employment base will continue to increase. In turn, as the employment base increases, more high-tech businesses will locate and expand into Arizona for the robust and skilled workforce that it offers.

According to the Arizona Office of Economic Opportunity (OEO), an estimated 114,400 individuals were employed in Arizona's cybersecurity and IT industry as of 2022. From 2021 to 2022, the high-tech industry added an additional 11,100 employees, accounting for 10.7% growth. Over the past decade, the industry has grown at an average rate of 5.1% per year as exhibited in Figure 3. This can be compared with the national high-tech industry growth rate of 3.6% per year over the same decade.

The cybersecurity and IT industry in Arizona is supported by expertise from progressive companies, access to top talent, support from universities and training institutes, and support from the public sector. Southern Arizona's military base and NETCOM headquarters are vital to the state's private industries, because many service members can apply the skills that they developed during their active duty to working in the high-tech industry. The industry has created ample opportunities for growth and employment, strengthening the state's economic base to power through economic disruptions.

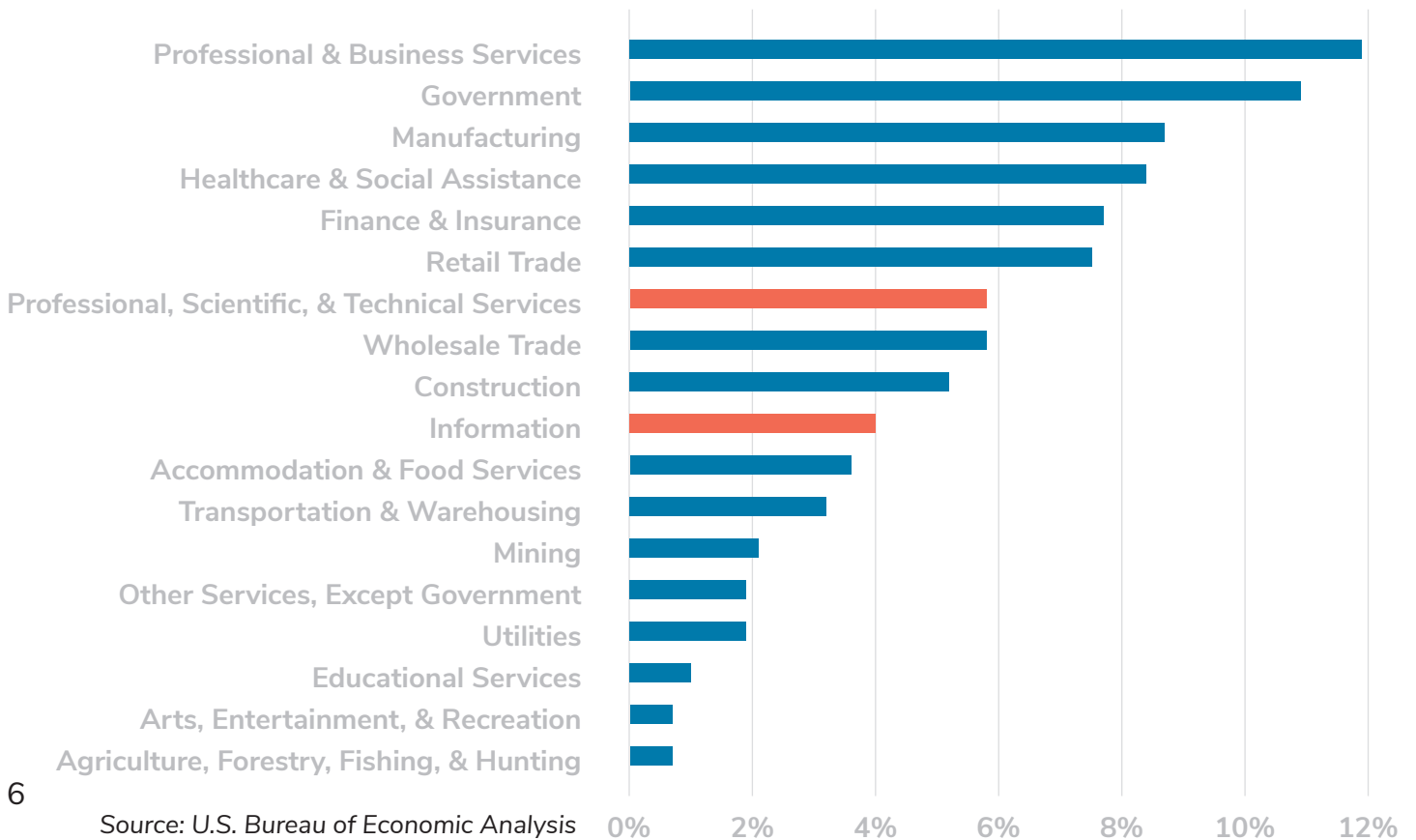
# The Cybersecurity/IT Industry

**Figure 1: Share of Total Employment in Arizona by Industry in 2022**



Source: U.S. Bureau of Labor Statistics; Arizona Office of Economic Opportunity

**Figure 2: Share of Arizona's GDP by Industry in 2022**

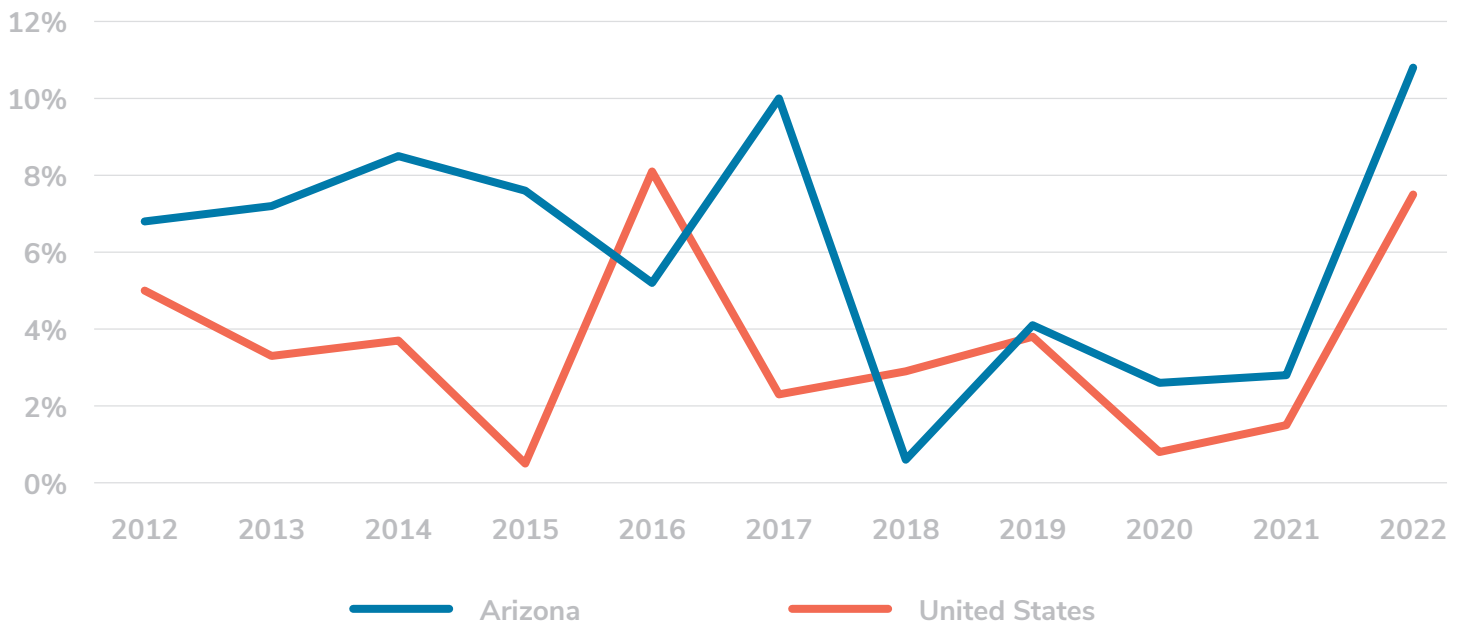


Source: U.S. Bureau of Economic Analysis



# The Cybersecurity/IT Industry

**Figure 3: Annual Cybersecurity/IT Industry Employment Change in Arizona and the U.S.**



Source: U.S. Bureau of Labor Statistics; Arizona Office of Economic Opportunity

## Occupations in the Cybersecurity and IT Industry

Occupational data within the high-tech industry must be reviewed in order to determine specific areas of the industry that will most support the state's economic development goals. Areas of focus should include the high-wage and high-growth occupations that will best support Arizona's economic development. Table 2 provides detailed information regarding high-tech occupations including the educational attainment levels required, mean wages, and their projected growth over the next decade.

Table 2 clearly indicates that the occupations within this industry have high educational attainment levels in comparison to other industries. Because a higher education attainment level is generally required in the industry, these occupations in return offer higher wages. Thus, efforts should continue to attract more high-tech businesses that will, in turn, bring in higher-education occupations that offer high-wage jobs. The wages from the increase in employment in the industry will bolster the state's economic growth.

With more of the world conducting business on the internet these days, the need for cybersecurity is becoming more and more critical. Therefore, the expected employment base growth rates are likely to increase even more over time.

Table 2 presents detailed information of occupations that are currently in demand by high-tech companies. The average wage of the overall industry was estimated to be \$92,812, according to the OEO. Computer network architect occupations earned the highest mean wage at \$125,323 as of 2022. The occupation that earned the lowest mean wage in 2022 was for computer user support specialists at \$59,973.

# The Cybersecurity/IT Industry

Table 2: Occupations in the Cybersecurity and IT Industry

Occupation Title	10-Year Employment Growth Rate	Mean Wage	Educational Attainment Needed for Entry
Information Securities Analysts	46.5%	\$107,423	Bachelor's Degree
Computer and Information Research Scientist	25.1%	\$125,296	Master's Degree
Web Developers	21.8%	\$68,606	Bachelor's Degree
Computer Systems Analysts	20.3%	\$107,065	Bachelor's Degree
Web and Digital Interface Designers	19.7%	\$78,111	Bachelor's Degree
Software Quality Assurance Analysts and Testers	19.6%	\$88,431	Bachelor's Degree
Computer Network Architects	19.0%	\$125,323	Bachelor's Degree
Software Developers	19.0%	\$121,926	Bachelor's Degree
Database Architects	18.3%	\$122,560	Bachelor's Degree
Database Administrators	17.5%	\$99,372	Bachelor's Degree
Network and Computer Systems Administrators	17.3%	\$91,895	Bachelor's Degree
Computer User Support Specialists	17.2%	\$59,973	Some College, No Degree
Computer Network Support Specialist	14.1%	\$66,520	Associate's Degree
<b>Cybersecurity and IT Industry Total</b>	<b>19.1%</b>	<b>\$92,812</b>	-
<b>Statewide Total Employment</b>	<b>17.2%</b>	<b>\$58,620</b>	-

Source: U.S. Bureau of Labor Statistics; Arizona Office of Economic Opportunity

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# The Cybersecurity/IT Industry

Figure 4 measures Arizona’s cybersecurity and IT industry as an aggregate and by occupations. Figure 4 presents a “bubble chart” that provides a perspective on the size of the occupational groups, their respective wages, and the growth opportunities of the occupations with job duties, skills, and/or education related to the high-tech industry as defined by the SOC system<sup>3</sup> in the Greater Phoenix Area. This gives a perspective of the size of the industry as well as the growth opportunities the industry has.

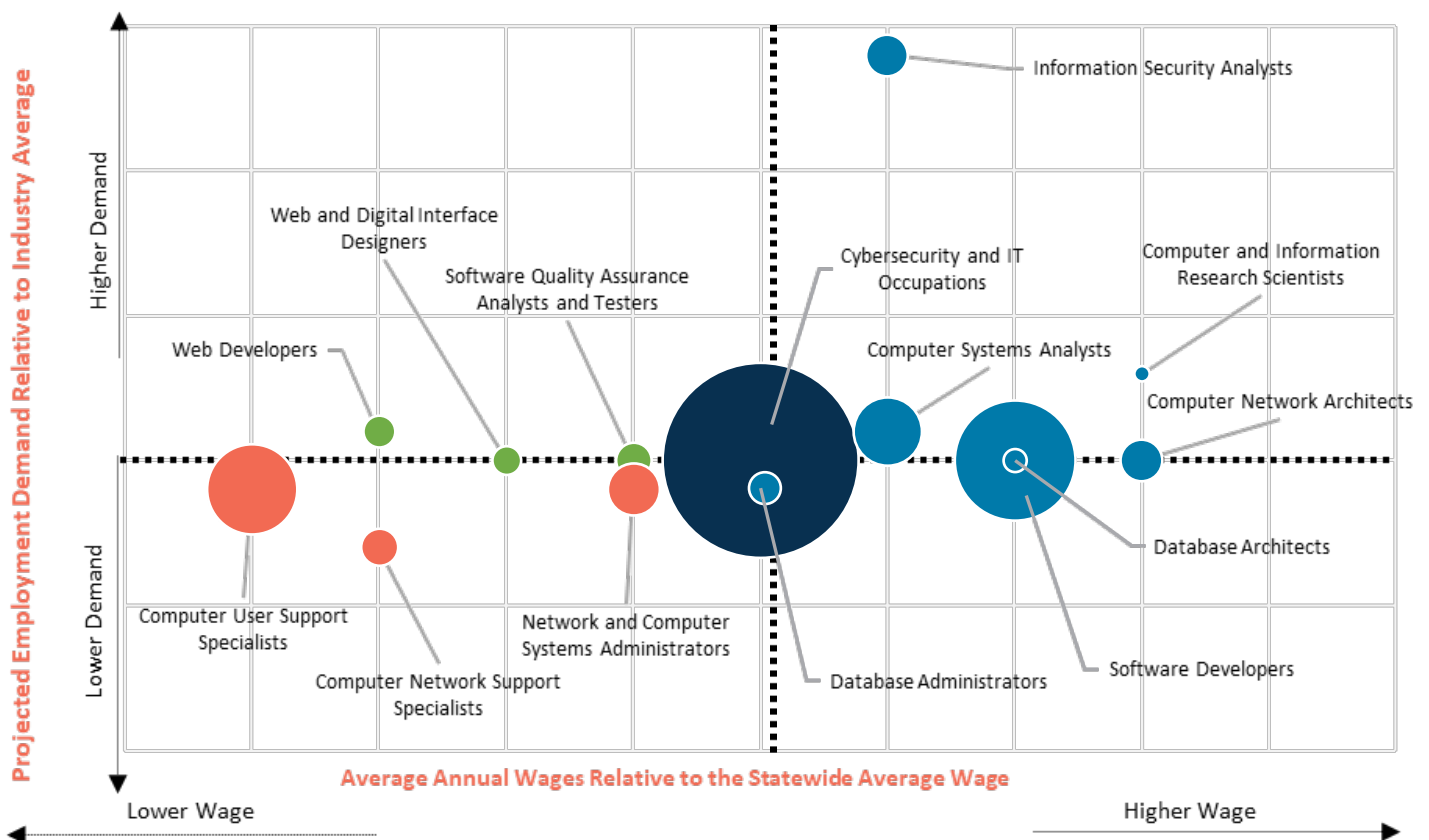
The occupations in Figure 4 are “mapped” based on whether the jobs are high-wage or low-wage and illustrate the level of future demand. In principle, an economic region should focus efforts on the employment categories that are projected to be in high-demand moving forward and offer higher wages.

The occupations that lie below the dashed horizontal line have a lower forecasted demand – meaning that the occupations are likely to see smaller employment growth in comparison to the industry average. Those occupations that lie above the dashed horizontal line have a higher forecasted demand.

The size of each circle represents the total employment base or current supply of workers within that occupation as of 2021 from the OEO’s 2021-2031 occupation projections. For example, the computer user support specialist circle is bigger than the web developers circle – meaning that there was a greater supply of computer user support specialists than there were web developers as of 2021.

For perspective on the size of the cybersecurity and IT industry relative to the occupational groups, the darker blue bubble was added which represents the industry as an aggregate. Note: The cybersecurity and IT bubble is based on the SOC data on the industry level and the occupational group bubbles are based on SOC data.

**Figure 4: Employment Demand and Wage levels by Occupation – Cybersecurity and IT Industry**



Source: Arizona Office of Economic Opportunity

# The Cybersecurity/IT Industry

## Highlighting Educational Programs Preparing Arizona's Cybersecurity and IT Workforce

- Maricopa Community Colleges offers computer and information technology as a program with options of exploring into gaming, web design and development, cybersecurity, computer, and IT programming, among others.

The colleges offer modern equipment, advanced laboratories, internships, and flexible specialized classes for the students wanting to pursue a career in computer and information technology. The colleges offer over sixty different certificates, ten different associate degrees, and two bachelor's degrees.

In 2022, the Maricopa Community College system awarded 507 certificates and 430 associate's degrees in cybersecurity, computer, and IT related majors.

(2021-2022)	Cybersecurity Trades	
	Computer & IT Certificates	Computer & IT Associate's Degrees
Community College		
Glendale Community College	97	73
Mesa Community College	71	72
Estrella Mountain Community College	26	62
Chandler-Gilbert Community College	36	58
Rio Salado Community College	65	39
Phoenix College	44	34
Scottsdale Community College	12	34
South Mountain Community College	53	25
Paradise Valley Community College	12	21
GateWay Community College	91	12
Total – Maricopa County	507	430

Source: National Center for Education Statistics – Integrated Postsecondary Education Data System

## The Cybersecurity/IT Industry

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- **Northern Arizona University's Bachelor of Arts in computer information technology** program was created to provide the fundamental skills necessary for continuous learning and adaptability of the quickly changing technology environment. It offers the ability to learn business skills that will go alongside the IT skills acquired through the program. NAU also offers master's degree programs involving computer information technology, where students can continue on the path of higher education.
- **University of Arizona's computer and information science department** offers over 45 different specific degree options within their program. The department has created a reputation of excellence, with its dedication to research in the areas of artificial intelligence, algorithms, security, systems, visualization, programming languages, as well as parallel and high-performance computing. The degrees include cyber defense, cloud computing, cybersecurity, data science, digital forensics, engineering management, information warfare and so many others.
- **Arizona State University School of Computing and Augmented Intelligence** within the Ira A. Fulton Schools of Engineering offers a diverse set of programs surrounding computer information technology. Degree options include computer science, computer systems engineering informatics, and data science analytics and engineering among others. It is possible to obtain a bachelors, masters, or doctorate for many of these degree options. ASU's school has dedicated efforts in preparing their graduate students to present innovative solutions to real world problems.



## The Cybersecurity/IT Industry

**Table 4: Sample of Degrees Awarded by Classification of Instructional Program (CIP) and Major - 2021-2022**

CIP or Major Related to the Cybersecurity and IT Industry	ASU	NAU	UA	Total
Classification of Instructional Program				
Bachelor's Degree in Computer and Information Sciences and Support Services	1,051	156	424	1,631
Master's Degree in Computer and Information Sciences and Support Services	610	183	123	916
Doctoral Degree in Computer and Information Sciences and Support Services	18	2	13	33
Specific Majors				
Bachelor's of Science Degree in Computer Science	607	89	212	908
Bachelor's of Science Degree in Information Technology	249	50	82	381
Bachelor's of Science Degree in Graphic Information Technology	240	-	-	240
Bachelor's of Science Degree in Software Engineering	175	-	-	175
Bachelor's of Science Degree in Cyber Operations	-	-	125	125
Master's of Science Degree in Computer Science/Information Technology	355	150	182	687
Bachelor's of Science Degree in Mechanical Engineering	276	72	-	348
Bachelor's of Science Degree in Management	252	114	180	546
Master's of Science Degree in Computer Science	355	150	-	505
Master's of Science Degree in Electrical & Computer Engineering	99	-	96	195

Source: Arizona Board of Regents.

Note: Information on degrees awarded for every major was not available.

# The Cybersecurity/IT Industry

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## Key Findings

The evidence suggests that the state of Arizona will be positioned as a high-tech industry leader, as long as efforts to build the supply of high value-added talent continues to be a priority.

The occupational groups with higher projected demand relative to the aggregate industry includes the information securities analysts, computer and information research scientists, web developers, computer systems analysts, web and digital interface designers, and software quality assurance analysts and testers.

Computer network support specialists, computer user support specialists, network computer system administrators, database administrators, and database architects are expected to have a lower projected demand relative to the high-tech industry.

The occupational groups including computer network architects, computer and information research scientists, database architects, software developers, information securities analysts, computer systems analysts, and database administrators all had wages that exceeded the cybersecurity and IT industry average. However, computer network architects and computer and information research scientists earn the highest wages relative to the high-tech industry as a whole.

With the aim of meeting the expected demand of the cybersecurity and IT industry businesses in Arizona, efforts should be focused on developing and attracting high-skilled individuals with information technology and information systems, computer science, information science, software engineering, computer engineering, and cybersecurity backgrounds.

**The occupational groups including computer network architects, computer and information research scientists, database architects, software developers, information securities analysts, computer systems analysts, and database administrators all had wages that exceeded the cybersecurity and IT industry average. However, computer network architects and computer and information research scientists earn the highest wages relative to the high-tech industry as a whole.**

# The Cybersecurity/IT Industry

**Table 5: Future Supply and Demand in the Cybersecurity and IT Services Industry**

	No. of Jobs
10-Year Projected Demand in Cybersecurity and IT Workers	19,500
10-Year Projected New Supply of Cybersecurity and IT Workers	18,800
<b>Surplus/(Shortage)</b>	<b>(700)</b>

Notes: Estimates for the 10-year projected demand in cybersecurity/IT workers is based on OEO’s estimated job growth for the industry as a whole. Estimates for the 10-year projected new supply of cybersecurity/IT workers is based on the expected number of graduates and certification awarded in the identified majors related to the industry. The calculations assume a 50% graduate retention rate for the identified cybersecurity and IT majors from Maricopa Community Colleges and the state’s three public universities.

Source: U.S. Bureau of Labor Statistics; Arizona Office of Economic Opportunity; Arizona Board of Regents; National Center for Education Statistics – Integrated Postsecondary Education Data System.

Note: These calculations were conducted to provide context on the state’s potential future workforce gap and talent pipeline within the state in the cybersecurity and IT industry; however, the estimates are based on a limited availability of data and highly assumption based. These limitations should be taken into consideration when interpreting and generalizing the findings of this high-level analysis.





# The Cybersecurity/IT Industry

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## Recent Cybersecurity and IT Progress

- **Arizona Cyber Command Center:** In October of 2021, Arizona opened a new Cyber Command Center. The command center serves as the strategic planning, facilitation, and coordination office for the information security of the state.

Arizona Cyber Command is tasked with identifying information security and privacy protection risks within the state and to direct agencies to adopt risk mitigation strategies, methods, and procedures that will minimize the risks. The center is responsible for developing, implementing, and maintaining statewide information security policies, along with ensuring that state agencies are in compliance, as well as producing a coordinated statewide assurance plan for information privacy and security.

The Cyber Command Center's duties include operating the state security operation center which is responsible for central detection, reporting, and response efforts for security breaches and incidents across Arizona. The command center develops strategies as necessary to protect the information systems and data in the state from cyber threats. It also operates the cybersecurity aspects of enterprise-level infrastructure and services.

A program running out of the cyber command center includes the Arizona Information Sharing and Analysis Center ("AZ-ISAC"). This program was designed to bring private and public sectors together to increase threat information sharing between agencies and their counterparts. Overall, the Arizona Cyber Command Center is for coordinating efforts between local, state, and federal agencies and the private sector to detect and respond to cyber threats.

- **ASU AND IBM – Quantum Technology:** Arizona State University ("ASU") has launched the Quantum Collaborative ("the collaborative"), a robust initiative to discover the breadth and diversity of advanced applications of quantum technology.

The Quantum Collaborative fosters meaningful partnerships between companies, educational institutions, and organizations across the world. Partners include IBM, Google Quantum AI, Purdue University, and Virginia Tech.

As part of the Quantum Collaborative, ASU will be a hub within the IBM Quantum Network facilitating cloud access to IBM's quantum computers and resources. This will allow organizations to join the ASU hub to further their efforts using quantum technology and computing in industries like pharmaceutical development, finance, artificial intelligence, and cybersecurity.

The Quantum Collaborative will streamline research and development of quantum technology to optimize its benefits to industries by developing a high-skill talent pipeline. A primary platform of the collaborative is to create a sustainable quantum-enabled workforce.

These workforce development efforts will be made possible by creating certifications and upskilling opportunities across skill areas like engineering, chemistry, materials science, human performance, and manufacturing. The collaborative will help align executives, researchers, entry-level engineers, and educational institutions in the shared mission of advancing quantum technology to realize the myriad of opportunities for economic mobility that are possible.

The initiative represents Arizona's dedication to propelling itself in the computing industry through meaningful collaborations.

# The Cybersecurity/IT Industry

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- **Incubator Programs:** The State of Arizona, the University of Arizona and Arizona State University have made concerted efforts to support startup entrepreneurs with incubator and accelerator programs. Incubator programs support early-stage startups with resources like mentorship and office space dedicated to the longevity of a startup without a set timeframe. On the other hand, accelerator programs aim to accelerate the growth of an existing startup company with a fixed timeframe and a competitive application process.

Some of Arizona's incubator and accelerator programs include the ASU Entrepreneurship and Innovation Institute, the Arizona Center for Innovation, the AZ Tech Accelerator, and the Innovation, Science, and Technology incubator. Especially within the technology space, these programs empower efforts of innovation and entrepreneurship that positively benefit the economy.

Located at the University of Arizona, the Arizona Center for Innovation ("AZCI") is an incubator that promotes the development of high-tech companies in Southern Arizona with a focus on implementing substantive business development strategies. Areas of focus include aerospace, advanced composites and materials, information technology, environmental technology, life sciences, and optics/phonics.

Arizona's commitment to technological innovation is clear with the contributions of incubator and accelerator programs that have empowered entrepreneurial startup efforts, especially in the cybersecurity/IT industry.

- **Arizona Commerce Authority Initiatives:** The Arizona Commerce Authority ("ACA") is committed to developing the state's technology and innovation ecosystem with pro-innovation programs and policies.

The Institute of Automated Mobility ("IAM"), directed by the ACA, is a collaborative effort to unite all three of Arizona's public universities, government leaders, and industry leaders in advancing state-of-the-art research and testing. One of IAM's featured projects is the "Network Safety Performance Prediction". This project utilizes artificial intelligence and the state's traffic camera network to oversee the introduction of automated vehicles improving safety and operational insights of traffic management officials.

ACA demonstrates its efforts to support the technology and innovation space with functional policy programs as well. The Research & Development Tax Credit Program ("R&D tax credit") and the Computer Data Center Program ("CDC") are particularly meaningful to advancements in the cybersecurity/IT industry. The R&D tax credit provides an Arizona income tax credit for increased research and development activities in the state, while the CDC provides a Transaction Privilege Tax and Use Tax exemptions at the state, county, and local levels, on qualifying purchases of CDC equipment.

The policies and programs implemented by the ACA show Arizona's strength and assurance to making the state a premier destination for the cybersecurity/IT industry.



## Conclusions

This report is one in a series of reports highlighting workforce supply and demand in five target high-wage, high-demand industries. The full series of reports can be accessed at [www.phoenixchamberfoundation.com/wfseries](http://www.phoenixchamberfoundation.com/wfseries).

Efforts by the state, local governments, and economic development organizations in strengthening Arizona's base sector industries and attracting new businesses to the region has created a high-demand for employment in the five target industries outlined in this series. However, based on the current talent pipeline and projections, significant workforce shortages are expected in four of the five target industries if the state does not focus efforts on educating and training individuals.

- The manufacturing industry will suffer from a labor shortage of an estimated 10,200 employees over the next 10 years. On a broad basis, the occupational groups with a high projected demand include the food processing workers, woodworkers, engineers, and operations specialties managers groups.
- Over the next 10 years, the state will demand approximately 36,900 construction jobs. The occupational groups with the highest expected demand include construction trades workers and supervisors of construction and extraction workers.
- The healthcare industry overall will experience a labor shortage of approximately 76,000 over the next decade. The occupations with the highest demand include nurse practitioners, occupational therapist assistants, physician assistants, physical therapist assistants, and home health and personal care aides, among others.
- The financial services industry will be short approximately 5,200 workers over the next 10 years. The occupations including financial examiners, credit counselors, personal financial advisors, and loan officers are expected to have a high-demand relative to the entire financial services industry.
- Over the next decade, the cybersecurity/IT services industry will experience a relatively minor shortage of 700 workers. The occupational groups with higher projected demand compared to the industry as a whole include information securities analysts, computer and information research scientists, web developers, computer systems analysts, web and digital interface designers, and software quality assurance analysts and testers.

Prioritizing education and technical training programs to meet the future demand for workers in the identified fields is critical in continuing Arizona's growth momentum and securing the state's long-term economic sustainability.

**Table 6: Future Supply and Demand in the Five Target Industries**

Industry	Surplus/(Shortage)
Manufacturing Workers	(10,200)
Construction Workers	(32,100)
Healthcare Workers	(76,000)
Financial Services Workers	(5,200)
Cybersecurity/IT Services Workers	(700)

Notes: Estimates for the 10-year projected demand for workers is based on OEO's estimated job growth by industry. Estimates for the 10-year projected new supply of workers is based on the expected number of graduates and certification awarded in the identified majors related to each industry.

Source: U.S. Bureau of Labor Statistics; Arizona Office of Economic Opportunity; Arizona Board of Regents; National Center for Education Statistics – Integrated Postsecondary Education Data System.



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