SAWORKS

INFORMATION TECHNOLOGY & CYBERSECURITY

DEMAND OCCUPATION AND EDUCATION REPORT

2019

saedf
san antonio economic development foundation

TABLE OF CONTENTS

SECTION 1
EXECUTIVE SUMMARY/INTRODUCTION 4

SECTION 2
IN DEMAND OCCUPATIONS: INFORMATION TECHNOLOGY AND CYBERSECURITY 5

- Software Developers, Applications
- Software Developers, Systems Software
- Information Security Analysts

BRIGHT OUTLOOK OCCUPATIONS 12

- Software Developers, Applications
- Software Developers, Systems Software
- Information Security Analysts

SECTION 3
EDUCATION PROVIDERS 16

Featured Four-Year Providers 18

- Hallmark University
- Our Lady of the Lake University
- Purdue Global
- St. Mary's University
- Trinity University
- Texas A&M University San Antonio
- University of the Incarnate Word
- University of Texas San Antonio

Featured Community College Providers

- Alamo Colleges – Northeast Lakeview 26
- Alamo Colleges – Northwest Vista
- Alamo Colleges – Palo Alto College
- Alamo Colleges – San Antonio College
- Alamo Colleges – St. Philip's College

Featured Training and Certification Providers 31

- Codeup
- DC Industries
- Dynamic Advancement
- Microsoft Software & Systems Academy
- New Horizons Computer Learning
- Open Cloud Academy

SECTION 4
RECOMMENDATIONS AND CALLS TO ACTION 37

SECTION 5
APPENDIX/SOURCES 42

INTRO

San Antonio is experiencing a period of transformational growth. With an estimated 66 new residents per day and growing, this community expects to add an over 1 million residents by 2040. The secret is out. San Antonio is a competitive city for business investment that boasts a growing workforce and high quality of life that appeals to young professionals, families and military alike. To ensure San Antonio's continued economic prosperity through this transformational growth period, it is up to San Antonio public, private, education and workforce development leaders to work together to build a sustainable, skilled workforce pipeline for San Antonio.

SA Works, the San Antonio Economic Development Foundation's (SAEDF) workforce development team, is an industry-led program aligning San Antonio's education providers and private sector to promote economic mobility. SA Works' goal is to reduce the skills gap in target industries by producing the needed skills from local education and training programs to create a robust workforce pipeline. The community's first IT and Cybersecurity Demand Occupation and Education Report studies San Antonio's IT and cybersecurity industry, its education providers, and the largest hiring employers to better understand potential skills gaps and serve as a catalyst for alignment in education and industry before these skills gaps worsen. As communities across the US are working to address these challenges, San Antonio's unique ability to collaborate across sectors allows this community to address these potential issues head on.

IT and Cybersecurity were prioritized for this report, ahead of other target industries that include manufacturing and bioscience, because cybersecurity and IT presents the greatest opportunity for San Antonio to become a global industry leader. The IT and Cybersecurity industry is growing and attracting global employers like EY, PwC, Booz Allen Hamilton, Lockheed Martin and The Hut Group to grow tech operations in San Antonio. The community can continue this momentum by ensuring we are not only an attractive city for tech talent to move to, but that we are a city producing our own, homegrown tech talent.

San Antonio's local institutions of higher education are making critical investments in capacity for programs related to high-tech careers in Information Technology, Cybersecurity, and Data Science. Approximately $200M in funding from the University of Texas Board of Regents, private donations, and contributions from the State of Texas, Bexar County, and the City of San Antonio will help the University of Texas at San Antonio (UTSA) expand its urban campus in the heart of San Antonio's downtown, a National Security Collaboration Center and School of Data Science will directly supply top talent to the local cybersecurity and technology industries.

While higher education institutions continue to adapt to the changing environment and grow, technology jobs continue to evolve, and do not necessarily require a degree, extensive experience, or skills in computer science, programming knowledge, or coding skills to launch a successful career in technology. Demand for professionals in cybersecurity continue to outpace the supply of skilled workers and those with 2-year degrees and industry acknowledged certificates are able to launch IT and Cybersecurity careers and further bolstering the workforce pipeline.

In this emerging and broadening profession, demand is rising for both highly skilled specialists with technical skill sets, as well as the business-oriented individual who brings operational excellence and bottom line business results to a wide spectrum of elements that compose an organization's information technology and cyber security needs.

Opportunities to join the workforce in IT and cybersecurity are available and are becoming increasingly dependent on a widening range of occupational skills, experience levels, and backgrounds. In addition to a broad spectrum of technical and professional skills, in which the most in demand skills will be featured in this report, essential skills, or "soft skills" have been identified as critical with the understanding that new employees can rapidly acquire technical skills as they gain experience.

This report highlights the occupations in highest demand in San Antonio, as well as the skills and qualifications required to compete for these jobs, based on primary employer data and reputable data sources. In each occupation featured, the report also highlights some of the most visible elements of cybersecurity practice across high tech jobs that are in demand in the San Antonio region.

Bridging the gap between demand and San Antonio's supply, this report also provides an asset map of the education providers in San Antonio focused on these demand occupations. The goal is to provide a useful resource for career explorers, individuals who are new to the field and still planning their career, someone who is planning a career change, or the seasoned professional looking to reskill or upskill as part of the next step on their career journey.

Mapping local education providers in alignment with high demand occupations provides a catalytic opportunity to work collaboratively across the community to identify gaps and work collectively to bridge those gaps. With intentional partnerships and alignment between industry and education providers to address our workforce challenges, San Antonio is well positioned to build upon its reputation as a leading destination for relocation and expansions as well as a place to call home and build a successful career.

We welcome your feedback on this report and hope to continue the dialogue on San Antonio's highest demand occupations. Together, San Antonio is addressing its workforce needs today while preparing for the growing workforce demand in its IT and Cybersecurity industry.

IN DEMAND OCCUPATIONS:
INFORMATION TECHNOLOGY AND CYBERSECURITY

The top three information technology and cybersecurity occupations in San Antonio are Software Developers - Applications, Software Developers - Systems Software, and Information Security Analysts, as identified via primary source through a confidential survey completed by over 30 small, medium, and large organizations in the San Antonio metropolitan area who specialize in providing information technology or cybersecurity services, or maintain a dedicated staff of information technology and cybersecurity professionals.

SOFTWARE DEVELOPERS, APPLICATIONS

75%

of surveyed employers indicated a hiring need for APPLICATIONS SOFTWARE DEVELOPERS.

SOFTWARE DEVELOPERS, SYSTEMS SOFTWARE

56%

of surveyed employers indicated a hiring need for SYSTEMS SOFTWARE DEVELOPERS.

INFORMATION SECURITY ANALYSTS

53%

of surveyed employers indicated a hiring need for INFORMATION SECURITY ANALYSTS.

	San Antonio Workforce Size*	5-Year Workforce Increase (2012-2017)*	5-year Growth Projection (2017-2022)*	Annual Median Earnings*
Software Developers, Applications	5,224	1,701 (48.3% increase)	966 (18.5% increase)	$98,426
Software Developers, System Software	1,376	-7 jobs (.5% decrease)	191 (13.9% increase)	$98,426
Information Security Analysts	1,123	394 (54% increase)	206 (18.3% increase)	$87,027

BRIGHT OUTLOOK JOBS

- COMPUTER OCCUPATIONS, ALL OTHERS
- COMPUTER USER SUPPORT SPECIALISTS

The Bright Outlook Jobs are identified as jobs being added to the San Antonio Metropolitan area at a more rapid pace than the national job growth rate, using datapoints from EMSI as support.

	San Antonio Workforce Size*	5-Year Workforce Increase (2012-2017)*	5-year Growth Projection (2017-2022)*	Annual Median Earnings*
Computer Occupations, All Others	2,766	859 (45.1% increase)	282 (10.2% increase)	$81,765
Computer User Support Specialists	4,797	764 (18.9% increase)	549 (11.4% increase)	$49,858

*source: Emsi Workforce Availability – October 2018

SOFTWARE DEVELOPERS, APPLICATIONS

TOTAL SAN ANTONIO WORKFORCE

5,224 JOBS

5-YEAR GROWTH PROJECTION, 2017-2022

The occupation is projected to INCREASE by 966 from 2017-2022 (18.5%), outpacing the national projected growth rate of 18.2%

MEDIAN EARNINGS

$98,426

Source from EMSI Workforce Availability Summary – October 2018

Applications Software Developers bring a combination of creativity and technical ability required to program new software applications, as well as bring new features and functionality to existing software applications. Generally speaking, the work of Applications Software Developers is aligned to specific projects which use a variety of programming languages or "code" to develop web-based applications designed to increase productivity or offer a new service to end users. Applications Software Developers are in extremely high demand in the San Antonio area, and are highly autonomous – ranging from high paying jobs in organizations across all industries to entrepreneurs using their creativity and knowledge of programming languages to solve new problems, develop new mobile tools, games, and other services. Candidates who possess both software development skills using the most in-demand programming languages and an understanding of the Agile approach to software development are considered the most competitive in the field. An increasing emphasis on secure software development methods will continue as organizations increase their spending toward organization-wide cybersecurity strategies and further develop a risk management approach to creating and distributing web-based software which, by design, often integrates with other systems containing sensitive data.

Feedback from local employers indicated that most of **all qualified candidates for these occupations** came from a **4-year university**. Veterans came in second as the most common source of qualified candidates for Software Developers, Applications. There is a **strong connection** between the **demand for security clearance** and **matching available jobs to veterans** and transitioning service members who are more likely than civilians to possess these clearances.

TOP 5 POSTED JOB TITLES

- Software Engineers
- Java Developers
- Software Developers
- Cloud Engineer Architects
- Salesforce Developers

EMPLOYERS WITH MOST ACTIVE POSTINGS – SEPTEMBER 2018

ORACLE rackspace USAA accenture iHeartMEDIA INC

JOB POSTING ANALYTICS

During the period of August 2017 – September 2018, **232 hires were made, on average, per month**.

TOP QUALIFICATIONS

EDUCATION LEVEL REQUIREMENTS

- Bachelor's Degree
- Associate Degree

INDUSTRY CERTIFICATIONS

- CISSP
- CSSLP

TOP COMPLIANCE SCREENING AND SECURITY CLEARANCE(S) CLASSIFICATIONS

- Criminal Background Check
- Work Status Verification
- Secret Clearance
- Top-Secret Sensitive Compartmentalized Information Clearance (TS-SCI)

TOP SKILLS

ESSENTIAL (TECHNICAL) SKILLS BY TECHNOLOGY CATEGORY

- Hardware
  - Network Appliances, Traffic
  - Network Appliances, Security
  - Servers
- Cloud Platforms
  - Amazon Web Services (AWS)
  - Microsoft Azure
- Operating Systems
  - Microsoft Server
  - Linux (Red Hat, CentOS, Ubuntu)
- Programming Languages
  - Java
  - Python
  - Javascript
- Database Systems
  - Microsoft SQL Server
  - MySQL

MARKETABLE (SOFT) SKILLS

- Teamwork and Interpersonal
- Analytical
- Complex Problem Solving

SOFTWARE DEVELOPERS, SYSTEMS SOFTWARE

TOTAL SAN ANTONIO WORKFORCE

1,376 JOBS

5-YEAR GROWTH PROJECTION, 2017-2022

The occupation is projected to INCREASE by 191 from 2017-2022 (13.9%), outpacing the national projected growth rate of 8.4%

MEDIAN EARNINGS

$112,341

Source from EMSI Workforce Availability Summary – October 2018

Systems Software Developers are the Information Technology Professionals who are responsible for the development of new and existing systems that control and allow an organization's network to operate efficiently and with a high level of availability. System software developers are often responsible for designing, developing, testing, and maintaining software aligned with the operating system level. Employers are increasingly looking to fill positions to help modernize their network and migrate to new platforms. As servers, storage, networking services, and connected software applications increasingly become accessible through a subscription model and accessible via the cloud, Systems Software Developers, which have a holistic conceptual and technical understanding of Information Technology infrastructure, data security requirements, and possess the ability to integrate new services into the network environment, are in demand at an all-time high.

New methods of deploying infrastructure and software, known as "DevOps," is built on the foundation of using a collaborative approach between software developers and traditional IT Operations to build, test, and release changes more rapidly and with fewer errors. Systems Software Developers are often working behind the scenes to make a collective impact on the automation of organizational functions. Employers are often sourcing talent from competitors who have undertaken similar projects, signaling that candidates with education and work experience are the most competitive to fill these occupations. Veterans with security clearances, prior work experience, and relevant education are likely among the most competitive applicants for this occupation.

FEEDBACK FROM LOCAL EMPLOYERS HIGHLIGHTED AN **UNDERSTANDING OF "AGILE" FRAMEWORK** FOR SOFTWARE DEVELOPMENT AS **A KEY SKILL FOR SOFTWARE DEVELOPERS,** SYSTEMS SOFTWARE.

TOP 5 POSTED JOB TITLES

- Systems Engineers
- Software Engineers
- Research Engineers
- Firmware Engineers
- Research Analysts

EMPLOYERS WITH MOST ACTIVE POSTINGS – SEPTEMBER 2018

SwRI USAA Rackspace MacB Northrop Grumman

JOB POSTING ANALYTICS

During the period of August 2017 – September 2018, 58 hires were made, on average, per month.

TOP WORK SCENARIOS

- Modify existing software to correct errors, allow it to adapt to new hardware, or to improve its performance
- Analyze user needs and system requirements to determine feasibility of design within cost, time, and scope
- Develop and direct software system testing and validation procedures, programming and documentation

TOP QUALIFICATIONS

EDUCATION LEVEL REQUIREMENTS

- Bachelor's Degree
- Associate Degree

INDUSTRY CERTIFICATIONS

- CompTIA Security +
- CISSP (Certified Information Systems Security Professional)
- MCSE (Microsoft Certified Systems Engineer)

TOP COMPLIANCE SCREENING AND SECURITY CLEARANCE(S) CLASSIFICATIONS

- Criminal Background Check
- Work Status Verification
- Top-Secret Sensitive Compartmentalized Information Clearance (TS-SCI)

TOP SKILLS

ESSENTIAL (TECHNICAL) SKILLS BY TECHNOLOGY CATEGORY

- Hardware
  - Servers
  - Network Appliances, Traffic
  - Network Appliances, Security
- Cloud Platforms
  - Microsoft Azure
  - Amazon Web Services (AWS)
- Operating Systems
  - Microsoft Server
  - Linux (Red Hat, CentOS, Ubuntu)
- Programming Languages
  - Java
  - C++
- Database Systems
  - Microsoft SQL Server
  - MySQL

MARKETABLE (SOFT) SKILLS

- Teamwork and Interpersonal
- Complex Problem Solving

INFORMATION SECURITY ANALYSTS

TOTAL SAN ANTONIO WORKFORCE

1,123 JOBS

5-YEAR GROWTH PROJECTION, 2017-2022

The occupation is projected to INCREASE by 206 from 2017-2022 (18.3%), outpacing the national projected growth rate of 16.4%

MEDIAN EARNINGS

$87,027

Source from EMSI Workforce Availability Summary – October 2018

Information Security Analysts provide security measures to an organization with the intent of protecting computer systems and networks from risks associated with unauthorized use and/or access to company data and other digital assets. Unauthorized use is not limited to parties outside of the company network, and new developments in network scanning and threat detection are being used to uncover malicious actions both inside and outside of an organizations network. As investments in Cybersecurity accelerate in the public and commercial sectors, largely due to the increase of cyberattacks and other incidents that put sensitive data at risk, organizations are rapidly updating their risk management strategies to include dedicated Cybersecurity operations which oversee the security of an organization's network.

The demand for Information Security Analysts in San Antonio is extremely high and offers high wage jobs in both the public and commercial sectors. San Antonio ranks #2 to Washington, DC for federal and defense contracting opportunities and has a rapidly growing commercial market for cybersecurity services. Feedback from local employers indicated that a higher volume of qualified candidates for Information Security Analysts come from the Veteran and Transitioning Military Community than graduates of 4-year university programs. Transitioning Service Members and Veterans with Information technology experience (or the interest and aptitude to learn new skills) and a security clearance often possess an advantage over civilians without a security clearance for high paying jobs with Federal contractors. Not limited to professionals that only possess highly technical skills, Information Security Analyst occupations include job titles and primary responsibilities which focus on identifying and managing risk, creating business process improvements, and coordination of security incident response plans.

EMPLOYER FEEDBACK HIGHLIGHTED **UNDERSTANDING OF THE PROJECT MANAGEMENT PROFESSIONAL FRAMEWORK FROM PMI** AS AN IMPORTANT DISTINCTION FOR INFORMATION SECURITY ANALYSTS.

Those who hold a Project Management Professional (PMP) Certification and are interested in a career in Cybersecurity are likely to have many opportunities to explore in the commercial sector.

TOP 5 POSTED JOB TITLES

- Information Security Analysts
- Security Engineers
- Cyber Security Engineers
- Information Security Specialists
- Cyber Security Analysts

EMPLOYERS WITH MOST ACTIVE POSTINGS – SEPTEMBER 2018

leidos USAA WELLS FARGO

Booz | Allen | Hamilton GENERAL DYNAMICS

JOB POSTING ANALYTICS

During the period of August 2017 – September 2018, 51 hires were made, on average, per month.

TOP WORK SCENARIOS

- Review, analyze and make recommendations to re-architect or modify existing hardware (including networking) infrastructure based on new or changing business needs
- Analyze user needs and system requirements to determine feasibility of design within cost, time, and scope
- Conduct changes, revisions, repairs, or expansion to the hardware (including networking) infrastructure to meet new requirements
- Conduct changes, revisions, repairs, or expansion to the application layer to meet new requirements
- Architecture of new hardware (including networking) environments, including that of the network layer, to accommodate upgrades, modifications, or replacement solutions within the application layer
- Respond to and prioritize change requests to software applications from internal or external end users
- Review, analyze and make recommendations to rewrite or modify existing applications based on new or changing business needs

TOP QUALIFICATIONS

EDUCATION LEVEL REQUIREMENTS

- Bachelor's Degree
- Associate Degree

INDUSTRY CERTIFICATIONS

- CISSP
- Security+
- Certified Ethical Hacker
- PMP

TOP COMPLIANCE SCREENING AND SECURITY CLEARANCE(S) CLASSIFICATIONS

- Criminal Background Check
- Work Status Verification
- Secret Clearance
- Top-Secret Sensitive Compartmentalized Information Clearance (TS-SCI)

TOP SKILLS

ESSENTIAL (TECHNICAL) SKILLS BY TECHNOLOGY CATEGORY

- Hardware
  - Network Appliances, Security
  - Servers
  - Routing and Switching
  - Network Appliances, Traffic
- Cloud Platforms
  - Amazon Web Services (AWS)
  - Microsoft Azure
- Operating Systems
  - Microsoft
  - Linux
- Programming Languages
  - Python, #1
  - C++
  - C#
  - JavaScript
- Database Systems
  - Microsoft SQL Server
  - MySQL

MARKETABLE (SOFT) SKILLS

- Analytical
- Teamwork and Interpersonal
- Critical Thinking
- Complex Problem Solving

BRIGHT OUTLOOK OCCUPATIONS:

"Bright Outlook Occupuations" are the jobs that are expected to grow or add job openings at a more rapid pace than the national growth rate. These occupations in San Antonio represent a category of high-tech occupations with a wide range of job titles that may afford opportunities for professionals who seek to use their business acumen and project management skills to excel in a career in the field of information technology. Understanding where the demand is expected to increase in the future can allow San Antonio education providers to prepare now for the potential future demand for these fast-growing occupations.

COMPUTER OCCUPATIONS, ALL OTHER

TOTAL SAN ANTONIO WORKFORCE

2,276 JOBS

5-YEAR GROWTH PROJECTION, 2017-2022

The occupation is projected to INCREASE by 282 from 2017-2022 (10.2%), outpacing the national projected growth rate of 7.6%

MEDIAN EARNINGS

$81,765

Source from EMSI Workforce Availability Summary – October 2018

The increased spending in IT directly impacts the rising demand for Solution Architects, who are highly compensated professionals who provide support to sales departments, as well as provide consulting services to internal IT and external organizations in the design of new investments and upgrades to an organization's information technology infrastructure. These investments and upgrades will continue to be necessary for organizations to remain competitive by leveraging newer technologies that run more efficiently and scale at a lower cost than older legacy systems. Both Project Managers and Solution Architects must leverage their abilities to solve business problems against a more generalized and high-level understanding of technological concepts without requiring technical certifications or deep knowledge of how to administer technology. These are rewarding occupations for solution-oriented managers who can serve internal and external customers' needs while navigating the constraints of time, scope, and cost. Regulations such as HIPPA, GDPR, PCI, and others will always provide opportunity for these roles as well as create new jobs in this category that are aligned with supporting a company's cybersecurity strategy from a governance, risk management, and compliance standpoint.

TOP 5 POSTED JOB TITLES

- Project Managers (Computer and Mathematical)
- Solutions Architects
- IT Quality Assurance Analysts
- Software Engineers
- Project Managers (Management)

PROJECT MANAGERS AND SOLUTION ARCHITECTS—TWO OF THE HIGHEST DEMAND JOBS UNDER THIS CATEGORY—ARE CRITICAL TO LOCAL EMPLOYER SUCCESS.

Those who possess strong conceptual knowledge of cybersecurity principles and project management experience are highly valued by employers.

EMPLOYERS WITH MOST ACTIVE POSTINGS - SEPTEMBER 2018

ORACLE USAA rackspace Booz | Allen | Hamilton accenture

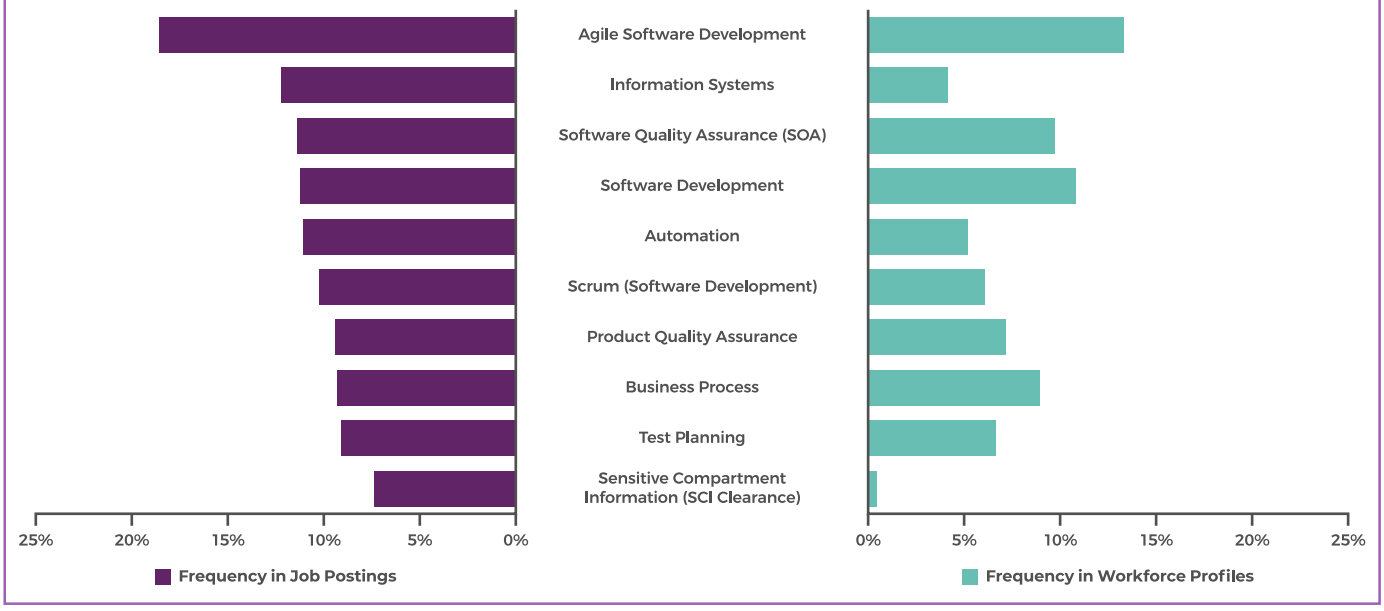
TOP QUALIFICATIONS

INDUSTRY CERTIFICATIONS

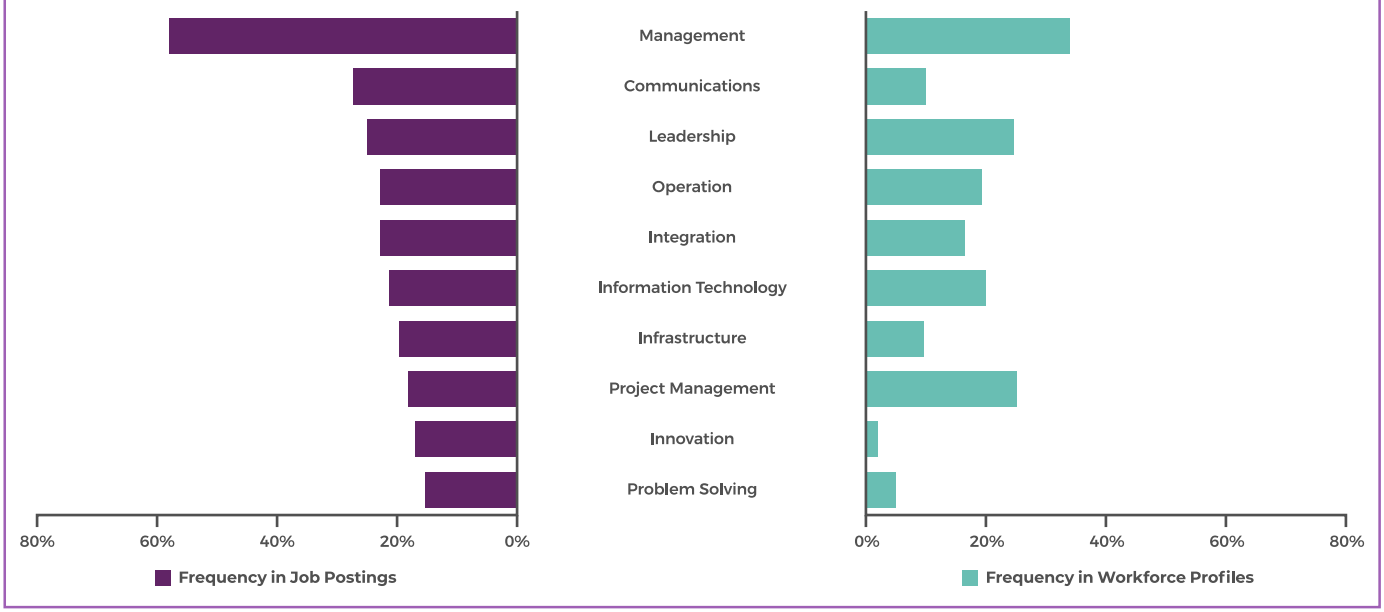
- PMI-PMP (Project Management Professional)
- CompTIA Security+
- PMI-ACP (Agile Certified Practitioner)

TOP SKILLS

HARD SKILLS



ESSENTIAL SKILLS



COMPUTER USER SUPPORT SPECIALISTS

TOTAL SAN ANTONIO WORKFORCE

4,797 JOBS

5-YEAR GROWTH PROJECTION, 2017-2022

The occupation is projected to INCREASE by 549 from 2017-2022 (11.4%), outpacing the national projected growth rate of 8.8%

MEDIAN EARNINGS

$49,858

Source from EMSI Workforce Availability Summary – October 2018

Computer User Support Specialists provide support and technical assistance to end users of networked devices, including computing devices, operating systems, connected devices, and software. In most cases, an individual who specializes in this work interacts with computer users that do not possess the technical skills to resolve these problems, providing a great opportunity for individuals who excel at providing excellent customer service. Strong active listening and communication skills, bolstered by an aptitude for creative problem solving and an intellectual curiosity for information technology systems can serve as basic requirements for jobs that provide on-the-job training and informal training with experienced workers. Many employers would consider this occupation a great entry point into an information technology career which has the potential to open up several pathways to higher paying jobs, including all that have been featured in this report. As companies continue to enhance their cybersecurity presence, a job as a computer user support specialist can also be an empowering opportunity to provide education to computer users on best practices which can be observed when using company devices, software, and data.

JOBS IN THIS CATEGORY **PAY WELL** AND **SERVE AS A PRACTICAL ENTRY POINT INTO A CAREER** IN INFORMATION TECHNOLOGY OR CYBERSECURITY, and often serves as the starting point for many high paying and specialized high tech jobs.

TOP 5 POSTED JOB TITLES

- IT Help Desk Specialist
- IT Support Analyst
- Desktop Support Technician
- Client Support Specialist
- Support Specialists

EMPLOYERS WITH MOST ACTIVE POSTING

UNITEDHEALTH GROUP · Booz | Allen | Hamilton · ORACLE · GENERAL DYNAMICS · accenture

JOB POSTING ANALYTICS

- During the period of August 2017 – September 2018, 244 hires were made, on average, per month.

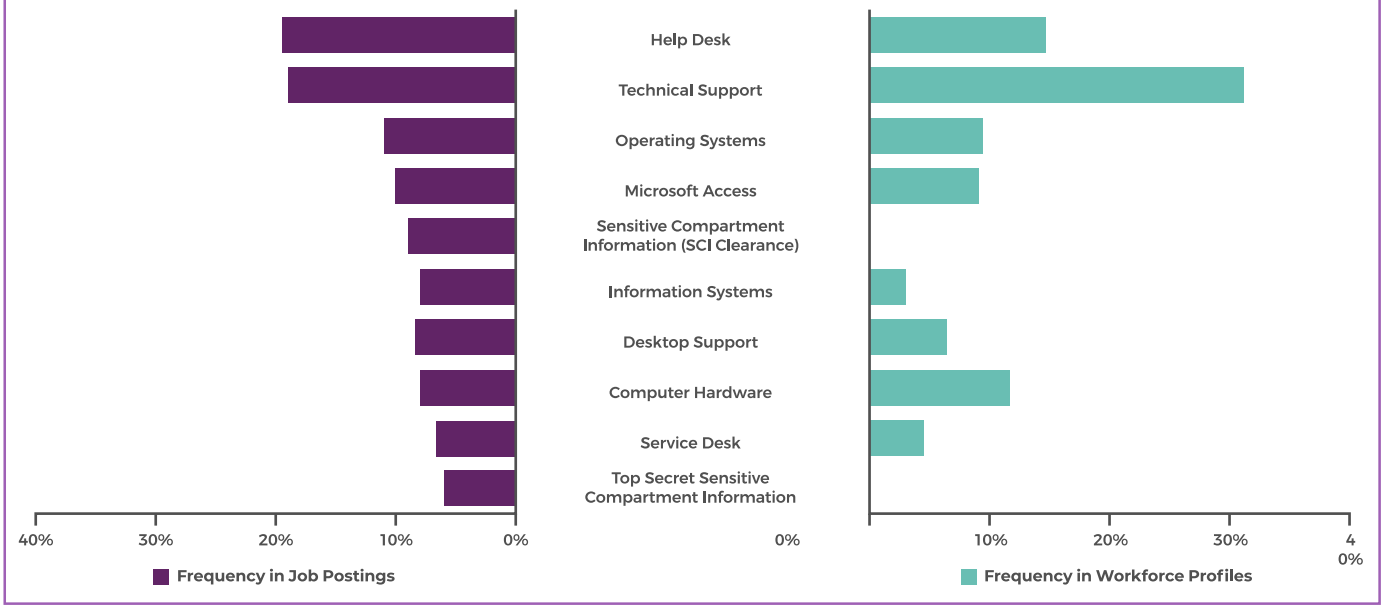
TOP QUALIFICATIONS

INDUSTRY CERTIFICATIONS

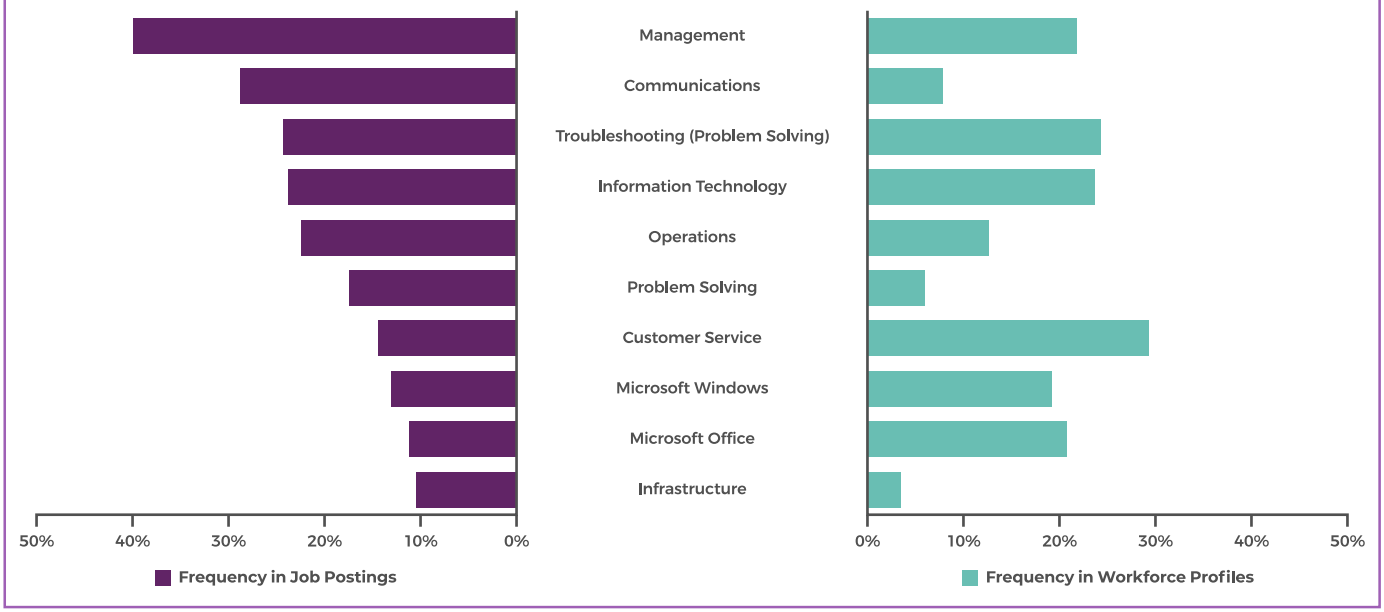
- PMI-PMP (Project Management Professional)
- CompTIA Security+
- PMI-ACP (Agile Certified Practitioner)

TOP SKILLS

HARD SKILLS



ESSENTIAL SKILLS



EDUCATION PROVIDER ASSET MAPPING:

San Antonio is positioning itself competitively to prepare our future cybersecurity workforce with 13 colleges and universities that have specifically-focused cyber degree programs ranging from an Associate's Degree to a Ph.D. Five of those colleges and universities have achieved designation as a Center for Academic Excellence in Cyber Defense/Information Assurance Education by the U.S. Department of Homeland Security and National Security Agency – more than any other city in the nation. Some of these San Antonio area colleges and universities are also recognized for their work in cybersecurity, artificial intelligence (AI) and data science by the private sector.

The education institutions included in this study represent education providers with programs aligned to the occupations identified in this study as "in-demand" as well as occupations with a bright outlook for the San Antonio metropolitan area. In total, 19 institutions provided primary data in the form of a survey and are featured in this study, including Public and Nonprofit Universities, Community Colleges, and private training providers. The following pages highlight the results from these surveys, supplemented with data publicly available from provider websites.

The findings of this study are intended to inform individuals including employers, career seekers, education providers, policy makers, and other interested parties of the top in-demand occupations in information technology and cybersecurity. Just as importantly, it represents an education provider asset map demonstrating the variety of programs available for individuals seeking skills training required to build a career in information technology or cybersecurity.

The following education provider information is directly sourced from these institutions.

Provider Name	Software Developers, Applications	Software Developers, System Software	Information Security Analysts	Computer Occupations, All Others	Computer User Support Specialists	Online	Financial Aid	Career Services
Our Lady of the Lake University		X	X			X	X	X
St. Mary's University	X		X		X		X	X
Trinity University	X	X					X	X
Texas A&M – San Antonio	X	X	X		X		X	X
The University of the Incarnate Word	X		X		X		X	X
UTSA	X	X	X			X	X	X
Northwest Vista College	X		X		X	X	X	X
Northeast Lakeview College					X	X	X	X
Palo Alto College	X		X		X	X	X	X
San Antonio College	X		X		X	X	X	X
St. Philip's College			X		X	X	X	X
Codeup	X						X	X
DC Industries*		X	X		X			
Dynamic Advancement		X	X	X	X			X
Hallmark University		X	X		X	X	X	X
New Horizons Computer Learning Centers	X	X	X	X	X	X	X	X
Open Cloud Academy			X		X			X
Purdue Global	X	X	X			X	X	X
Microsoft Software & Systems Academy	X	X	X				X	X

*Exclusive to US Military

HALLMARK UNIVERSITY

Hallmark University provides a Bachelor of Science in both Information Systems and Cybersecurity, as well as Associate of Applied Science degrees in Information Technology with a choice of concentration in either Cisco (Networking) or Microsoft (Operating System) curriculum. Programs at Hallmark University are designed to leverage academic relationships with industry-recognized vendors including, CompTIA, Cisco Systems, Microsoft, and VMware. Hallmark University provides hands-on, scenario-based education and links their curriculum to the subject matter aligned with industry recognized certifications including A+, Security+, Network+, MCSA, MCSE, CCNA, CCENT, SSCP, CEH, and CAPM – providing students pursuing either an Associate's or Bachelor's Degree the opportunity to earn certifications alongside their Degreed Credentials.

TRAINING PROVIDER TYPE:

- Private (Nonprofit) Training Provider

ORGANIZATION CURRENTLY TRAINS FOR THE FOLLOWING OCCUPATIONS:

- Computer User Support Specialist
- Information Security Analyst
- Software Developer, Systems Software

TOP PROGRAMS THAT LEAD TO EMPLOYMENT IN IT AND CYBERSECURITY JOBS:

- BS Information Systems
- BS Cybersecurity
- AAS IT Cisco

LARGEST EMPLOYERS WHO HAVE HIRED PROGRAM GRADUATES:

University Health System, rackspace, SwRI, Booz | Allen | Hamilton, accenture

AVERAGE COST PER PARTICIPANT:

- $495 per semester credit hour.
  ~$60,000 for complete BS degree

AVERAGE COMPLETION TIME:

- 21 Months

WHEN ARE CLASSES OFFERED?

- Monday-Friday, During daytime business hours
- Evenings
- Anytime (Online)

ENTRY REQUIREMENTS FOR INCOMING STUDENTS:

- HS Diploma or GED, variety of entrance assessments such as SAT, ACT

POST-COMPLETION JOB PLACEMENT AND EMPLOYMENT SUPPORT:

- Hallmark University provides a dedicated career services department, resume and interview workshops, and active job placement services for students and alumni.

OUR LADY OF THE LAKE **UNIVERSITY**

Our Lady of the Lake University (OLLU) offers bachelor's degrees in Computer Information Systems and Security (CISS) that prepare graduates to become leading professionals in information systems and technology in all industries. OLLU has been designated as a National Center for Academic Excellence in Cyber Defense Education by the National Security Agency (NSA) and the Department of Homeland Security (DHS). Programs at OLLU prepare graduates for the wide-ranging field of information technology through hands-on experience with emerging technologies in the areas of Network Security and Administration, Database Management, Information Assurance and Security, Operating Systems, Programming, and System Analysis and Design. The Computer Information Systems and Security (CISS) programs at OLLU are tied to the federal government's objectives that encourage training and development of skilled professionals in order to protect the nation's information technology infrastructure. Graduates of the program are prepared to help develop, manage and protect computers and networks in government, medical centers, financial centers in virtually every sector of the economy. In addition to Bachelors programs which provide students a choice between a blend of Business Administration with and Computer Information Systems and Security (CISS) or a full CISS concentration, OLLU also provides a fully online, asynchronous Master's Program as well as an Online Information System Technology "Boot Camp" and an Information Assurance and Security Management Certificate that can be earned separately or as part of any Bachelor or Master's program.

TRAINING PROVIDER TYPE:

- Private, Catholic 4-Year University

ORGANIZATION CURRENTLY TRAINS FOR THE FOLLOWING OCCUPATIONS:

- Information Security Analysts
- Software Developers, Systems Software

TOP PROGRAMS THAT LEAD TO EMPLOYMENT IN IT AND CYBERSECURITY JOBS:

- Master of Science in CISS
- Bachelor of Science in CISS
- Bachelor of Business Administration in CISS

LARGEST EMPLOYERS WHO HAVE HIRED PROGRAM GRADUATES:

USAA accenture Frost GENERAL DYNAMICS rackspace

AVERAGE COST PER PARTICIPANT:

- $30,000 for Bachelor Programs, $27,000 for Master's Programs

AVERAGE COMPLETION TIME:

- 48 Months for Bachelors© Program, Online Master's Programs can be completed in as little as 12 months.

WHEN ARE CLASSES OFFERED?

- Monday-Friday, During daytime business hours
- Online
- Evenings
- Weekends

ENTRY REQUIREMENTS FOR INCOMING STUDENTS:

- Bachelor of Applied Studies in CISS is designed for transfer students only, requiring incoming students to have 18+ hours in CISS-related college credits on their transcript. Standard Admissions Requirements apply for other programs.

POST-COMPLETION JOB PLACEMENT AND EMPLOYMENT SUPPORT:

- OLLU CyberSaints Team – participation on this team further develops students' skills and knowledge through regional and national cybersecurity and information technology competitions, and provides networking opportunities and exposure to employers. OLLU also works closely with employers to provide internship opportunities. CISS students at OLLU have the opportunity to join the campus chapter of the Association of Information Technology Professionals (AITP). Becoming a member of AITP allows for students to network with industry professionals, participate in regional and national competitions, keep up to date on industry trends and explore leadership opportunities. Students in OLLU's CISS program have access to the University's Center for Information Assurance Management and Leadership (CIAML). The center was created to provide access to high-quality information assurance and security policies, procedures, standards and guidelines for the industry, the government and higher education. It serves as a resource for students and the community.

PURDUE UNIVERSITY GLOBAL

Purdue Global is a public, nonprofit, online university who delivers personalized online education tailored to the unique needs of adults who have work or life experience beyond the classroom with the goal of enabling students to develop essential academic and professional skills with the support and flexibility required to reach their career goals. Previously known as Kaplan University, Purdue Global offers Associate, Bachelor's, Master's and Certificate programs in information technology and cybersecurity, as well as cybersecurity management. Certificate programs include pathways in Cisco, Computer Forensics, Information Security, Microsoft Operating Systems, and Programming and Software Development. Curriculum is aligned to prepare students to obtain industry-recognized certifications, including but not limited to Network+, Security+, CISSP, and Certified Ethical Hacker.

TRAINING PROVIDER TYPE:

- (Nonprofit) Online Degree Program

ORGANIZATION CURRENTLY TRAINS FOR THE FOLLOWING OCCUPATIONS:

- Software Developers, Applications
- Computer User Support Specialist
- Information Security Analyst
- Software Developers, Systems Software

TOP PROGRAMS THAT LEAD TO EMPLOYMENT IN IT AND CYBERSECURITY JOBS:

- Associate of Applied Science in IT
- Bachelor of Science in IT
- Master of Science in IT

LARGEST EMPLOYERS WHO HAVE HIRED PROGRAM GRADUATES:

AVERAGE COST PER PARTICIPANT:

- Varies: $371 per credit in undergraduate programs, $420 per credit in graduate programs

AVERAGE COMPLETION TIME:

- 43 Months

WHEN ARE CLASSES OFFERED?

- Online Only

ENTRY REQUIREMENTS FOR INCOMING STUDENTS:

- Entry requirements vary by program. There is no entrance exam, however, IT experience recommended for Cyber program.

POST-COMPLETION JOB PLACEMENT AND EMPLOYMENT SUPPORT:

- Purdue Global provides students and alumni with comprehensive career planning and advising services, ranging from career exploration assessments to other resources which include resume reviews, interview preparation, and assistance with building an online presence to assist with a job search. Purdue Global also provides a career network, which is designed to function as a social platform for students and alumni to collaborate with each other and the Purdue Global Career Services team. Purdue also offers access to employers to work directly with their Career Services team to access their student an alumni network, advertise job postings, receive preselected candidates at no cost to the employer.

ST. MARY'S UNIVERSITY

St. Mary's University, as a Catholic Marianist University, fosters the formation of people in faith and educates leaders for the common good through community, integrated liberal arts and professional education, and academic excellence. St. Mary's University offers both Bachelor and Master's programs with a focus on Computer Science or Cybersecurity.

A Master's degree in Cybersecurity from St. Mary's provides students with knowledge, skills and best practices on how to monitor, secure and safeguard an organization's digital assets. This unique St. Mary's program combines technical rigor with sound ethics and implications to the law.

The Master of Science in Computer Science program at St. Mary's prepares students to manage a software development project from analysis, design, implementation, testing and maintenance. The program is designed to provide a deep understanding of the hardware and software components of computer systems along with databases, operating systems, software analysis and design methodologies, and software implementation and testing.

TRAINING PROVIDER TYPE:

- Private, Catholic 4-Year University

ORGANIZATION CURRENTLY TRAINS FOR THE FOLLOWING OCCUPATIONS:

- Software Developers, Applications
- Computer User Support Specialist
- Information Security Analyst

TOP PROGRAMS THAT LEAD TO EMPLOYMENT IN IT AND CYBERSECURITY JOBS:

- MS, Cybersecurity
- Graduate Certificate in Cybersecurity
- MS, Computer Science

LARGEST EMPLOYERS WHO HAVE HIRED PROGRAM GRADUATES:

USAA Raytheon Booz | Allen | Hamilton GENERAL DYNAMICS Rackspace

AVERAGE COST PER PARTICIPANT:

- Tuition information available at the website: **www.stmarytx.edu/admission/financial-aid/tuition**

AVERAGE COMPLETION TIME:

- 18 Months for Master's Program

WHEN ARE CLASSES OFFERED?

- Monday-Friday, During daytime business hours
- Evenings

ENTRY REQUIREMENTS FOR INCOMING STUDENTS:

- A Bachelor of Science degree is required for candidates in the MS in Cybersecurity, MS in CS, or MS in CIS programs.

POST-COMPLETION JOB PLACEMENT AND EMPLOYMENT SUPPORT:

- STRIVE Career Center at St. Mary's University — Successful, Transformative Results from Innovative Vocational Experiences — engages campus and community partners to provide vocational and experiential education opportunities for students. Employer services include an internal career portal where employers can post available job opportunities, including experiential opportunities which include internships and apprenticeships, as well as provide support for on-campus career fairs, information sessions, and on-campus interviews. Student resources at St. Mary's include career counseling and coaching, workshops, resume reviews, and access to available career opportunities through the internal career portal, and job fairs featuring top local and national employers.

TRINITY UNIVERSITY

Trinity University is a private, liberal arts and sciences institution in San Antonio, Texas, with a traditional college campus environment and a small student population of just over 2,400 and small class sizes to optimize the learning experience. Trinity is a residential campus, and students are required to live on-campus and carry a meal plan through the junior year. Along with providing strong academic programs, Trinity University takes pride in preparing students to thrive in a world that values critical thinking, incisive decision making, and extraordinary communication skills. Trinity's computer science department provides broad training in design, systems, applications, and the theory of computing. Students receive substantial laboratory experience with computers, programming, and other related areas, which provide the knowledge and tools to be successful in both theoretical understandings and applied computing. The Bachelor of Science in Computer Science is ideal for students interested in pursuing a career in computer science immediately after receiving their diploma, as well as those who are interested in graduate study in the field.

Ranked as the #1 University in the state of Texas by the College Consensus' annual Best Colleges & Universities rankings, Trinity University has a strong alumni network that helps students make real world connections to leaders across multiple industries to help them begin or further their career journey.

TRAINING PROVIDER TYPE:

- Private 4-Year University

ORGANIZATION CURRENTLY TRAINS FOR THE FOLLOWING OCCUPATIONS:

- Software Developers, Applications
- Software Developers, Systems Software

TOP PROGRAMS THAT LEAD TO EMPLOYMENT IN IT AND CYBERSECURITY JOBS:

- Bachelor of Science in Computer Science

LARGEST EMPLOYERS WHO HAVE HIRED PROGRAM GRADUATES:

USAA H-E-B DENIM GROUP rackspace

AVERAGE COST PER PARTICIPANT:

- Standard Tuition Schedule Applies
  inside.trinity.edu/student-financial-services

AVERAGE COMPLETION TIME:

- 48 months

WHEN ARE CLASSES OFFERED?

- Monday-Friday, During daytime business hours

ENTRY REQUIREMENTS FOR INCOMING STUDENTS:

- Standard University Admissions Requirements

POST-COMPLETION JOB PLACEMENT AND EMPLOYMENT SUPPORT:

- Trinity Career Services assists students and alumni with services ranging from career and interest assessments and coaching designed to help students research career interests and set goals from providing resources and active opportunities to help existing students and alumni land a career that aligns with their interests, aptitude, and level of experience. Trinity considers their career service as an integrated part of the educational experience at Trinity, and leverage the program to help students and alumni develop lifelong career-planning skills and stay connected long after graduation through their strong alumni network. Trinity provides workshops, networking events, an online recruitment system and a robust internship program which is connected to top employers across San Antonio.

TEXAS A&M UNIVERSITY-SAN ANTONIO

Texas A&M University-San Antonio (A&M-SA), founded in Fall 2008, is a comprehensive four-year university offering affordable, high-quality education currently serving nearly 6,500 students and has graduated more than 8,000 alumni. The student body is 60 percent female and 72 percent Hispanic, and approximately 77 percent of students are the first in their family to attend college. Students can pursue several degree options in the fields of Information Technology and Cyber Security with Bachelor's degree tracks aligned with Business Administration, Computer Science, and Applied Science degrees. Texas A&M University – San Antonio has also worked closely with Alamo Colleges to allow many of their 2-year A.A.S. programs aligned with Computer Science and Cybersecurity to transfer over and count credit towards their 4-year degree programs in Information Technology and Cyber Security. Future curriculum plans include a Bachelor's in Cyber Engineering Technology and a Master's in Computer Science with a concentration in Cybersecurity.

Texas A&M University-San Antonio been designated as a National Center for Academic Excellence in Cyber Defense Education by the National Security Agency (NSA) and the Department of Homeland Security (DHS) and has recently opened a new $63M Science and Technology Building which will further the innovation capabilities, educational training and research & development for the school's cybersecurity programs and will provide students with assets including a cloud computing lab, a cyber mobility lab, a simulated security operations center, along with a cyber engineering technology lab.

Located in the new Science and Technology Building is the Center for Information Technology and Cyber Security (CITCS), which will serve as a community resource to support the ongoing Cybersecurity education and best practices, including preparing students for cyber competitions and careers, developing "middle school to university" cyber student pathways, increasing campus and local business community Cybersecurity awareness and training, as well as promoting faculty and student research in IT and Cybersecurity.

Texas A&M University San Antonio also recently announced that it was selected as one of nine universities in the nation to join Facebook's Cyber Security University Program. As part of this program, the university is slated to offer a hybrid cybersecurity course to students underwritten by Facebook. It includes curriculum, mentorship, project development and training during a simulated cybersecurity attack side by side with Facebook employees in San Antonio.

TRAINING PROVIDER TYPE:

- Public 4-Year University

ORGANIZATION CURRENTLY TRAINS FOR THE FOLLOWING OCCUPATIONS:

- Software Developers, Applications
- Software Developers, System Software
- Computer User Support Specialist
- Information Security Analyst

TOP PROGRAMS THAT LEAD TO EMPLOYMENT IN IT AND CYBERSECURITY JOBS:

- BAAS, IA Concentration
- BBA CIS, IA Concentration
- BS Computer Science

LARGEST EMPLOYERS WHO HAVE HIRED PROGRAM GRADUATES:

USAA H-E-B accenture

AVERAGE COST PER PARTICIPANT:

- $8,216 per year

AVERAGE COMPLETION TIME:

- 48 months

WHEN ARE CLASSES OFFERED?

- Monday-Friday, During daytime business hours
- Evenings

ENTRY REQUIREMENTS FOR INCOMING STUDENTS:

- Standard Admissions Requirements (Available on the University website)

POST-COMPLETION JOB PLACEMENT AND EMPLOYMENT SUPPORT:

- The Office of Career Services prepares students for real life objectives and expectations regarding careers and employment through the use of innovative research and learning techniques. Career Services provides quality counseling in the areas of choosing a major, job search strategies, pursuing employment and graduate school opportunities. An online system available to students and alumni provides information on available job opportunities and internships, along with other resources that assist students and alumni with career planning and provide employers with a platform to upload opportunities and launch campus job fairs and information sessions. In addition, Texas A&M – San Antonio Career Services offers The Career Clothes Closet (CCC), an on-campus program dedicated to providing professional attire to students who are preparing for that all-important interview.

UNIVERSITY OF THE INCARNATE WORD

The University of Incarnate Word (UIW) is the largest Catholic university in Texas and the fourth-largest private university in the state. With a student-to-faculty classroom ratio of 14:1, UIW provides students with an environment that encourages excellence in academics. The Computer Information Systems program at UIW offers Bachelor of Science degrees in both Computer Information Systems (CIS) and Cyber Security Systems (CSEC). The theoretical knowledge and experiential skills covered in both degree plans provide students a foundation for multiple career paths in these technical fields.

The CIS and CSEC majors share foundation and advanced courses in computer hardware, networks, telecommunications, operating systems, programming, website development, database systems, systems analysis, and management of technology and IT personnel. CSEC students must complete sets of courses that focus on how to secure computer networks, how to design security into computer information systems, and how to secure organizational infrastructure and information. Career development courses include: Seminar, Internship, and Capstone or Practicum where students demonstrate expertise in a specific field by working for an outside organization.

The University of Incarnate Word is currently pursuing an NSA/DHS Center of Academic Excellence – Cyber Defense designation, and is active in the community, providing mentorship for local Cyber Patriot teams as well as participating in national cyber league competition, helping students train for other collegiate level competitions such as the Collegiate Cyber Defense Competition and prepares them for the workplace.

TRAINING PROVIDER TYPE:

- Software Developers, Applications
- Computer User Support Specialist
- Information Security Analyst

TOP PROGRAMS THAT LEAD TO EMPLOYMENT IN INFORMATION TECHNOLOGY AND CYBERSECURITY JOBS:

- BS CIS
- BS CIS/Cyber Security (Double Major)
- BS Cyber Systems Security

LARGEST EMPLOYERS WHO HAVE HIRED PROGRAM GRADUATES:

at&t H-E-B cps ENERGY Frost WHATABURGER

AVERAGE COST PER PARTICIPANT:

- $75,000

AVERAGE COMPLETION TIME:

- 48 Months

WHEN ARE CLASSES OFFERED?

- Monday-Friday, During daytime business hours
- Evenings

ENTRY REQUIREMENTS FOR INCOMING STUDENTS:

- Standard University Admissions Requirements (can be found online)

POST-COMPLETION JOB PLACEMENT AND EMPLOYMENT SUPPORT:

- The University of Incarnate Word provides Career Services which include individual career counseling, personality and career assessment, resume and cover letter review, career-related workshops, and programs to assist with the necessary skills needed for post-graduation success. UIW fosters relationships with campus departments and external employers to enhance internship job and career opportunities for current students and alumni.

UTSA UNIVERSITY OF TEXAS AT SAN ANTONIO

The University of Texas at San Antonio (UTSA) is home to the nation's top cybersecurity program, an interdisciplinary approach that spans three colleges: The College of Business, College of Engineering and College of Sciences. Students at UTSA may choose to specialize in computer science, computer engineering or information systems. Additional programs are offered in data center design, network and data center management, digital forensics and data analytics.

UTSA has three research centers: The Center for Infrastructure Assurance and Security, the Institute for Cyber Security and the Cyber Center for Security and Analytics. Research conducted at UTSA aims to combat global security challenges encountered by individuals, industry, government and the military. UTSA's research specialties include information security management and strategy, applied network and information systems security, government and industry cyber preparedness, and secure software and hardware design and engineering.

The University of Texas at San Antonio recently announced the creation of a National Security Collaboration Center (NSCC) and new School of Data Science in downtown San Antonio. The University of Texas System Board of Regents has committed $70M to help UTSA expand its urban campus in the heart of our downtown, and the NSCC and School of Data Science will build upon our city's growing cybersecurity and technology industries. In addition, $15M has been donated from San Antonio entrepreneur and Rackspace Hosting Inc. co-founder, Graham Weston, to support the downtown campus expansion.

In fall 2017, UTSA began offering a fully online B.B.A. in Cyber Security. Students in the online degree program have access to the same vast cybersecurity expertise that UTSA students currently experience on-campus.

University of Texas San Antonio has been designated as a National Center for Academic Excellence in Cyber Defense Education by the National Security Agency (NSA) and the Department of Homeland Security (DHS).

TRAINING PROVIDER TYPE:

- Public 4-Year University

ORGANIZATION CURRENTLY TRAINS FOR THE FOLLOWING OCCUPATIONS:

- Software Developer, Systems Software
- Information Security Analyst
- Software Developer, Applications

TOP PROGRAMS THAT LEAD TO EMPLOYMENT IN IT AND CYBERSECURITY JOBS:

- BBA, Cyber Security
- MSIT with Cyber Emphasis
- PHD in IT with Cyber Emphasis

LARGEST EMPLOYERS WHO HAVE HIRED PROGRAM GRADUATES:

H-E-B, USAA, VALERO

AVERAGE COST PER PARTICIPANT:

- Standard in-district and out-of-district tuition rates apply.

AVERAGE COMPLETION TIME:

- 54 Months

WHEN ARE CLASSES OFFERED?

- Monday-Friday, During daytime business hours Evenings
- Weekends
- Online* - Fewer classes available online. Online programs are completely segregated - EX. Online BBA students are online only. No mixed or blended. Resident program students get access to online modules that are available, however online students are online only. Currently working on getting all classes online.

ENTRY REQUIREMENTS FOR INCOMING STUDENTS:

- Standard Admissions Requirements (Available on the University website)

POST-COMPLETION JOB PLACEMENT AND EMPLOYMENT SUPPORT:

- The UTSA Career Center provides a dedicated team and resources to provide students and alumni with identifying and developing the skills necessary to pursue and achieve lifelong career goals. The Career Center is a robust source of information, resources, and services designed to assist with the first steps of career exploration through assessments and personalized coaching to providing the active job seeker or seasoned professional with in-person and self-selecting options ranging from resume and cover letter preparation to effectively increasing odds of selection through application and interview techniques designed to help a job seeker stand out as a top applicant. The UTSA Career Center provides work study and internship opportunities, as well as an active Alumni network and other resources designed to bring proximity to students and employers – including job fairs, seminars, and a robust online recruiting portal for employers and students. In addition to the UTSA Career Center, the Center for Student Professional Development, located within the College of Business, assists with Internships and job development.

ALAMO COLLEGES DISTRICT
Northeast Lakeview College

NORTHEAST LAKEVIEW COLLEGE

Northeast Lakeview College offers one-year certificate and continuing education options including CompTIA Certification Courses and "Bootcamps" (IT Fundamentals, A+, Network+, Security+), Cisco CCNA Education Tracks, Computer Repair Courses, and classes that help an individual become familiar with the basics of computer programming.

TRAINING PROVIDER TYPE:

- 2-Year Community College

ORGANIZATION CURRENTLY TRAINS FOR THE FOLLOWING OCCUPATIONS:

- Computer User Support Specialist

TOP PROGRAMS THAT LEAD TO EMPLOYMENT IN IT AND CYBERSECURITY JOBS:

- Network+ (Continuing Education)
- Security+ (Continuing Education)
- CCNA (Continuing Education)

LARGEST EMPLOYERS WHO HAVE HIRED PROGRAM GRADUATES:

AVERAGE COST PER PARTICIPANT:

- Standard in-district and out-of-district tuition rates apply. Program duration varies between certificate and Associate degree programs.

AVERAGE COMPLETION TIME:

- 1-2 Years

WHEN ARE CLASSES OFFERED?

- Monday-Friday, During daytime business hours
- Online
- Evenings
- Weekends

ENTRY REQUIREMENTS FOR INCOMING STUDENTS:

- Admissions information can be found at **alamo.edu/admission--aid/**

POST-COMPLETION JOB PLACEMENT AND EMPLOYMENT SUPPORT:

- Career Services offers an array of professional services designed to assist students with exploring, developing, and setting goals that relate to each student's unique educational and academic plans and align with career interests. Services include resume reviews, mock interview workshops, career fairs, and online employment resources. Connections to internships, apprenticeship programs, and work study programs are also available through Northeast Lakeview Career Services.

ALAMO COLLEGES
NORTHWEST VISTA COLLEGE

NORTHWEST VISTA COLLEGE

Northwest Vista College offers traditional daytime classroom setting as well as evening, Internet, hybrid and weekend courses. Most of the classes offered lead to a two-year associate degree or one-year certificate option. Degree options at Northwest Vista College include Computer Science, Game Development, Information Assurance and Cyber Security, Network and Cloud Architecture, and Network Administrator programs. Certificate programs include Computer Science, Game Development, Information Assurance and Cyber Security, Java Programming, Network & Cloud Architecture, Network Administrator, and Software Development. Professional Development courses are also available through Northwest Vista College that aim to help individuals further develop professional skills that are considered essential to the workplace.

TRAINING PROVIDER TYPE:

- 2-Year Community College

ORGANIZATION CURRENTLY TRAINS FOR THE FOLLOWING OCCUPATIONS:

- Software Developers, Applications
- Computer User Support Specialist
- Information Security Analyst

TOP PROGRAMS THAT LEAD TO EMPLOYMENT IN IT AND CYBERSECURITY JOBS:

- Cisco Certified Network Professional (CCNP) Advanced Technical Certificate
- Associate in Applied Science – Information Assurance and Cyber Security
- Associate in Applied Science – Game Development (Specializing in Game Programming)

LARGEST EMPLOYERS WHO HAVE HIRED PROGRAM GRADUATES:

CPS Energy, Rackspace, City of San Antonio

AVERAGE COST PER PARTICIPANT:

- Standard in-district and out-of-district tuition rates apply. Program duration varies between certificate and Associate's degree programs.

AVERAGE COMPLETION TIME:

- 1-2 Years

WHEN ARE CLASSES OFFERED?

- Monday-Friday, During daytime business hours
- Online
- Evenings
- Weekends

ENTRY REQUIREMENTS FOR INCOMING STUDENTS:

- Admissions information can be found at **alamo.edu/admission--aid/**

POST-COMPLETION JOB PLACEMENT AND EMPLOYMENT SUPPORT:

- Northwest Vista College Career and Transfer Services (CaTS) provides resources, guidance, and assistance with career exploration, career planning, academic advising, and job preparation services. Connections to internships, apprenticeship programs, and work study programs are also available through Northwest Vista Career and Transfer Services.

ALAMO COLLEGES
PALO ALTO COLLEGE

PALO ALTO COLLEGE

Founded in 1985 from the desire to provide higher education to residents of south San Antonio, Palo Alto College has spent more than 30 years serving over 100,000 individuals throughout San Antonio, Bexar County, and surrounding counties. Degree and Certificate options are offered under Palo Alto's Computer Information Systems and Computer Science programs and take form in the traditional daytime classroom setting as well as evening, Internet, hybrid and weekend courses.

TRAINING PROVIDER TYPE:

- 2-Year Community College

ORGANIZATION CURRENTLY TRAINS FOR THE FOLLOWING OCCUPATIONS:

- Software Developers, Applications
- Computer User Support Specialist
- Information Security Analyst

TOP PROGRAMS THAT LEAD TO EMPLOYMENT IN IT AND CYBERSECURITY JOBS:

- Associate of Applied Science, Computer Programmer
- Associate of Applied Science, Information Security and Cybersecurity
- Associate of Applied Science, Network Administrator

LARGEST EMPLOYERS WHO HAVE HIRED PROGRAM GRADUATES:

AVERAGE COST PER PARTICIPANT:

- Standard in-district and out-of-district tuition rates apply. Program duration varies between certificate and Associate degree programs.

AVERAGE COMPLETION TIME:

- 1-2 Years

WHEN ARE CLASSES OFFERED?

- Monday-Friday, During daytime business hours
- Online
- Evenings
- Weekends

ENTRY REQUIREMENTS FOR INCOMING STUDENTS:

- Admissions information can be found at **alamo.edu/admission--aid/**

POST-COMPLETION JOB PLACEMENT AND EMPLOYMENT SUPPORT:

- Palo Alto College has on-campus career services which provide academic and career counseling, as well as access to faculty advisors and industry advisory committees who assist with placement at local employers. Many other academic and career exploration resources are available to students, including online assessments, resume services, connections to internship and apprenticeship programs, and work study programs.

ALAMO COLLEGES DISTRICT
San Antonio College

SAN ANTONIO COLLEGE

Located just north of downtown, San Antonio College has provided students with a university-like feel for over 90 years and serves approximately 20,000 students each semester. San Antonio College maintains a thorough catalog of 2-year degree and certificate options to prepare students with the skills needed for high tech occupations in Information technology and Cybersecurity and has been designated as a National Center for Academic Excellence in Cyber Defense Education by the National Security Agency (NSA) and the Department of Homeland Security (DHS). Located in close proximity to downtown San Antonio's "tech district" and a variety of residential, transportation, and coworking options, San Antonio College provides a unique and affordable college experience. San Antonio College offers traditional daytime classroom setting as well as evening, Internet, hybrid and weekend courses. Most of the classes offered lead to a two-year associate degree or one-year certificate option. Degree options at San Antonio College include Computer Programming, Computer Support Specialist, Information Security, Network Administrator, and Secure Software Development programs. Certificate programs include Computer Programming, Computer Support Specialist, Information Security and Network Administrator programs.

TRAINING PROVIDER TYPE:

- 2-Year Community College

ORGANIZATION CURRENTLY TRAINS FOR THE FOLLOWING OCCUPATIONS:

- Software Developers, Applications
- Information Security Analyst
- Computer User Support Specialist

TOP PROGRAMS THAT LEAD TO EMPLOYMENT IN IT AND CYBERSECURITY JOBS:

- Associates in Applied Science – Network Administrator
- Associates in Applied Science – Computer Programmer
- Associates in Applied Science – Information Assurance and Cyber Security

LARGEST EMPLOYERS WHO HAVE HIRED PROGRAM GRADUATES:

rackspace. USAA SWBC CPS ENERGY

AVERAGE COST PER PARTICIPANT:

- Standard in-district and out-of-district tuition rates apply. Program duration varies between certificate and Associate degree programs.

AVERAGE COMPLETION TIME:

- 1-2 Years

WHEN ARE CLASSES OFFERED?

- Monday-Friday, During daytime business hours
- Online
- Evenings
- Weekends

ENTRY REQUIREMENTS FOR INCOMING STUDENTS:

- Admissions information can be found at **alamo.edu/admission--aid/**

POST-COMPLETION JOB PLACEMENT AND EMPLOYMENT SUPPORT:

- San Antonio College Career Services offers assistance with many resources available to students for exploring careers, researching career paths, creating a resume, and/or job searching. Career Services also collaborates with local employers by providing access to an online job bank to post available positions. The Transfer and Career Center can provide additional assistance for a student navigating their career path, including access to career coaching and advising services. Connections to internships, apprenticeship programs, and work study programs are also available through San Antonio College Career Services.

ALAMO COLLEGES DISTRICT
St. Philip's College

ST. PHILIP'S COLLEGE

St. Philip's College, founded in 1898, is a comprehensive public community college whose mission is to empower a diverse student population through educational achievement and career readiness. As a Historically Black College and Hispanic Serving Institution, St. Philip's College is a vital facet of the community, responding to the needs of a population rich in ethnic, cultural, and socio-economic diversity. St. Philip's College has been designated as a National Center for Academic Excellence in Cyber Defense Education by the National Security Agency (NSA) and the Department of Homeland Security (DHS). St. Philip's College offers a thorough catalog of traditional daytime classroom setting as well as evening, Internet, hybrid and weekend courses that specialize in high tech skills currently in demand by regional employers. Most of the classes offered lead to a two-year associate degree or one-year certificate option. Degree options at St. Philip's College include Business Management and Technology, Computer Maintenance Technology, Computer Maintenance Technology with Cisco Specialization, Health Information technology, Information technology Cybersecurity Specialist, Information technology Network Administrator, and Web and Mobile Developer programs. Certificate programs include Business Management and Technology, Computer Maintenance Technology with Cisco Specialization, Information Technology Cybersecurity Specialist, Information Technology Network Administrator, and Web and Mobile Developer programs.

TRAINING PROVIDER TYPE:

- 2-Year Community College

ORGANIZATION CURRENTLY TRAINS FOR THE FOLLOWING OCCUPATIONS:

- Computer User Support Specialist
- Information Security Analyst

TOP PROGRAMS THAT LEAD TO EMPLOYMENT IN IT AND CYBERSECURITY JOBS:

- Associate in Applied Science – Computer Maintenance Technology
- Associate in Applied Science – Information Technology Cybersecurity Specialist
- Associate in Applied Science – Information Technology Network Administrator

LARGEST EMPLOYERS WHO HAVE HIRED PROGRAM GRADUATES:

Microsoft, USAA, IBM, Rackspace, accenture

AVERAGE COST PER PARTICIPANT:

- Standard in-district and out-of-district tuition rates apply. Program duration varies between certificate and Associate degree programs.

AVERAGE COMPLETION TIME:

- 1-2 Years

WHEN ARE CLASSES OFFERED?

- Monday-Friday, During daytime business hours
- Online
- Evenings
- Weekends

ENTRY REQUIREMENTS FOR INCOMING STUDENTS:

- Admissions information can be found at **alamo.edu/admission--aid/**

POST-COMPLETION JOB PLACEMENT AND EMPLOYMENT SUPPORT:

- St. Philip's College provides career prep and placement services through the main St. Philip's campus on Martin Luther King Blvd. as well as the Southwest campus, located on Quintana road near Port San Antonio. St. Philip's College Career Services offers assistance with many resources available to students for exploring careers, researching career paths, creating a resume, and/or job searching. St. Philip's College Career Services collaborates with local employers by providing access to an online job bank to post available positions. The Career Center can provide additional assistance for a student navigating their career path, including access to career coaching and advising services. Connections to internships, apprenticeship programs, and work study programs are also available through San Antonio College Career Services.

CODEUP

Located in downtown San Antonio, Codeup offers an immersive, 18-week career accelerator program designed to help individuals launch a career in Full-Stack Web Development. Class sizes are kept small at an average of 22 students per cohort and are designed to encourage collaboration throughout the program, which helps prepare students in developing interpersonal and collaborative problem-solving skills possessed by the most competitive software development professionals. In February 2019, Codeup will serve its first cohort to train individuals for a career in Data Science. Both programs are full-time, in person, and project-based and take place over an 18-week period.

TRAINING PROVIDER TYPE:

- Private (For-Profit) Training Provider

ORGANIZATION CURRENTLY TRAINS FOR THE FOLLOWING OCCUPATIONS:

- Software Developers, Applications

TOP PROGRAMS THAT LEAD TO EMPLOYMENT IN IT AND CYBERSECURITY JOBS:

- Java Full-Stack Software Development Program

LARGEST EMPLOYERS WHO HAVE HIRED PROGRAM GRADUATES:

ORACLE USAA H-E-B TATA accenture

AVERAGE COST PER PARTICIPANT:

- $22,500

AVERAGE COMPLETION TIME:

- 4 Months

WHEN ARE CLASSES OFFERED?

- Monday-Friday, During daytime business hours

ENTRY REQUIREMENTS FOR INCOMING STUDENTS:

- Students must pass a problem-solving challenge and/or the command line review and/or complete the 30 hours of prework prior to joining the program.

POST-COMPLETION JOB PLACEMENT AND EMPLOYMENT SUPPORT:

- Codeup's program connects their students with career placement services no later than 9 weeks into the 18-week curriculum. Career placement services begin with career exploration assistance to help a Codeup student find work that aligns with their interests and skills. Codeup maintains strong relationships with local employers, and provides "Demo Days," job fairs and networking events, as well as an alumni network which results in providing strong employment outcomes for most students who complete the program. Because Codeup heavily focuses on employment outcomes, they stand behind their program by providing a refund of 50% of the student's tuition if they don't find work in 6 months.

DC INDUSTRIES

DC Industries is a mobile and global technology training company specializing in developing the foundations skill set of the cyber warrior. Specializing in serving Veterans and Active Service Members transitioning to civilian status with customized programs that offer on-site training and certification, DC Industries primarily serves government agencies to train incumbent workers with cybersecurity skills and certifications required to protect the nation's global information grid.

TRAINING PROVIDER TYPE:

- Private (For-Profit) Training Provider

ORGANIZATION CURRENTLY TRAINS FOR THE FOLLOWING OCCUPATIONS:

- Information Security Analyst
- Software Developer, Systems Software
- Computer User Support Specialist*

TOP PROGRAMS THAT LEAD TO EMPLOYMENT IN IT AND CYBERSECURITY JOBS:

- IT Foundation Program
  - Includes Certification Training and Testing for IT Fundamentals, Network+, and Security+.
- Security Program
  - Includes Certification Training and Testing for CSA+, CASP, CISM, and CRISC
- Network (CCNA) Program
  - Includes Certification Training and Testing for ICND1, ICDN2, and CCNA Security
- System Administration Program
  - Includes Certification Training and Testing for MCSA, Linux+/LPIC-1

LARGEST EMPLOYERS WHO HAVE HIRED PROGRAM GRADUATES:

- DCI provides training for Active Military and Veterans already employed.

AVERAGE COST PER PARTICIPANT:

- $2,500

AVERAGE COMPLETION TIME:

- 1 Month

WHEN ARE CLASSES OFFERED?

- Monday-Friday, During daytime business hours

ENTRY REQUIREMENTS FOR INCOMING STUDENTS:

- Incoming students must be active members of the US Military or Veterans.

PREREQUISITES:

- Prerequisites are determined on a case by case basis and are provided at the direction of the employer(s) sending their employees for training.

POST-COMPLETION JOB PLACEMENT AND EMPLOYMENT SUPPORT:

- DC Industries focuses on incumbent workforce training and works directly with employers.

DYNAMIC ADVANCEMENT

Dynamic Advancement, located at Port San Antonio, specializes in the advancement of cybersecurity training and certification for the defense and commercial sectors. Class sizes are kept small at approximately 10 students per cohort to encourage an optimal learning atmosphere. Instructors at Dynamic Advancement are industry recognized and certified subject matter experts (SME) who also currently work in the industry. In addition to offering multiple skills training and certification options, they also offer on-site testing facilities. Any student that completes a course designed to prepare a student to take a certification exam may continue to re-sit on a course as space is available until a passing score is achieved. On site testing centers for Pearson Vue, Kryterion, CLEP, and DSST are available.

TRAINING PROVIDER TYPE:

- Private (For-Profit) Training Provider

ORGANIZATION CURRENTLY TRAINS FOR THE FOLLOWING OCCUPATIONS:

- Computer User Support Specialist
- Information Security Analyst
- Software Developer, Systems Software
- Computer Occupations, All Other

TOP PROGRAMS THAT LEAD TO EMPLOYMENT IN IT AND CYBERSECURITY JOBS:

- CISSP
- PMP
- Certified Ethical Hacker
- CompTIA Security+

LARGEST EMPLOYERS WHO HAVE HIRED PROGRAM GRADUATES:

Booz | Allen | Hamilton, USAA, amazon, LOCKHEED MARTIN

AVERAGE COST PER PARTICIPANT:

- $3,000

AVERAGE COMPLETION TIME:

- 2 Months

WHEN ARE CLASSES OFFERED?

- Monday-Friday, During daytime business hours (In class)
- Evenings (In class)
- Weekends (In class)

ENTRY REQUIREMENTS FOR INCOMING STUDENTS:

- High School Diploma

POST-COMPLETION JOB PLACEMENT AND EMPLOYMENT SUPPORT:

- Alumni and employer network

Microsoft

Military Affairs | Microsoft Software and Systems Academy

EMBRY-RIDDLE AERONAUTICAL UNIVERSITY

MICROSOFT SOFTWARE & SYSTEMS ACADEMY

Microsoft Software & Systems Academy (MSSA) provides transitioning service members and veterans with critical career skills required for today's growing technology industry. The 18-week (or two 9-week terms) program offers training for high-demand careers in cloud development, cloud administration, cybersecurity administration, or database and business intelligence administration. Program graduates gain an interview for a full-time job at Microsoft or one of our hiring partners.

The MSSA program offered at Randolph Air Force Base is in partnership with Embry-Riddle Aeronautical University and provides training for cybersecurity administration.

TRAINING PROVIDER TYPE:

- 18-week university program

ORGANIZATION CURRENTLY TRAINS FOR THE FOLLOWING OCCUPATIONS:

- Software Developer, Applications
- Information Security Analyst
- Software Developer, Systems Software

TOP PROGRAMS THAT LEAD TO EMPLOYMENT IN IT AND CYBERSECURITY JOBS:

- The MSSA Program is an 18-week program providing different tracks that cover the following Specializations:
  - Cloud Application Development
  - Cybersecurity Administration
  - Database and Business Intelligence Administration
  - Server and Cloud Administration

LARGEST EMPLOYERS WHO HAVE HIRED PROGRAM GRADUATES:

accenture

Microsoft ORACLE rackspace

AVERAGE COST PER PARTICIPANT:

- Visit **military.microsoft.com/mssa** or contact the San Antonio program office by email at SanAntonio@erau.edu or by phone at (210) 659-0801

COMPLETION TIME:

- 18 weeks (or two 9-week terms)

WHEN ARE CLASSES OFFERED?

- Monday-Friday, During daytime business hours

ENTRY REQUIREMENTS FOR INCOMING STUDENTS:

- To begin the application process, first confirm that you:
  - Have command authorization, or current honorable service status
  - Meet the admission requirements for the University

  All applicants must work with with their Base Education Center or MSSA Academic Partner to gather and submit the following documentation and proofs:
  - Valid IT certification
  - High school diploma or GED certificate
  - Proof of successful completion of high school algebra (or test out)
  - Any financial aid applications (program voucher, GI Bill, or FAFSA)
  - Completed and signed application

  Additional requirements for active duty service members:
  - Attend MSSA Information Session and complete a screening interview with an education counselor
  - Submit proof of honorable service status

  Additional requirements for reservists or discharged service members:
  - Submit DD-214 proof of honorable discharge

POST-COMPLETION JOB PLACEMENT AND EMPLOYMENT SUPPORT:

- Upon successful completion of the MSSA program, participants are guaranteed an interview with Microsoft or one of its more than 400 hiring partners.

NEW HORIZONS

New Horizons Computer Learning Centers offers multiple options for skills-based training and certification preparation across several computing platforms and is a good resource for accessing vendor approved courses available as online modules and classroom instruction. New Horizons has partnerships with Microsoft, VMware, CompTIA, and Cisco and administers onsite certification exam testing at their Pearson Vue testing facility. New Horizons Computer Learning Centers also provides short term skills training programs in areas including AWS, Mobile Application Development (Apple and Android), DevOps methodologies, Blockchain, Information Security, Java Programming, Microsoft Azure as well as several other programming languages, applications, and platforms. In addition to technical training, New Horizons San Antonio offers professional development courses for soft skills training. Classes are small in size, with an average of 15 students per cohort. New Horizons provides a larger selection of vendor approved courses aligned with several industry recognized certifications that could be a great option for an IT professional who is looking to take their career to the next level as well as the newcomer to the field looking to acquire basic knowledge in a specialized field.

TRAINING PROVIDER TYPE:

- Private (For-Profit) Training Provider

ORGANIZATION CURRENTLY TRAINS FOR THE FOLLOWING OCCUPATIONS:

- Computer User Support Specialist
- Software Developer, Applications
- Software Developer, Systems Software
- Information Security Analyst
- Computer Occupations, All Others

TOP PROGRAMS THAT LEAD TO EMPLOYMENT IN IT AND CYBERSECURITY JOBS:

- Network System Administration Professional (NSAP)
- Security IT Associate (SITA)

LARGEST EMPLOYERS WHO HAVE HIRED PROGRAM GRADUATES:

at&t LOCKHEED MARTIN GENERAL DYNAMICS

AVERAGE COST PER PARTICIPANT:

- $21,450 for Professional programs and $7,500 for Associate Programs. Short term skills training and certification courses vary by vendor. Prices can be accessed at the online schedule of classes - **nhsanantonio.com/resources/pdf-course-schedule**

AVERAGE COMPLETION TIME:

- Completion time varies depending on the program. Program length ranges from just a few days to several weeks in duration.

WHEN ARE CLASSES OFFERED?

- Monday-Friday, During daytime business hours
- Evenings
- Online

ENTRY REQUIREMENTS FOR INCOMING STUDENTS:

- New Horizons uses Wonderlic assessment testing, reviews resumes for work experience, and conducts student interviews to determine suitability

OTHER PREREQUISITES:

- Some programs require a high school diploma.

POST-COMPLETION JOB PLACEMENT AND EMPLOYMENT SUPPORT:

- New Horizons has a career services department that provides workshops for finding job opportunities, preparing resumes, building interview skills, leveraging resources such as LinkedIn, as well as mock interview sessions to help students prepare for landing a job. New Horizons also has established relationships with multiple employers and Information technology contracting and staffing agencies in San Antonio.

OPEN CLOUD ACADEMY

Open Cloud Academy is a Rackspace inspired education center focused on developing technical talent, and enhancing technical career opportunities in our local community. Open Cloud Academy employs a team of subject matter experts to guide and empower students to achieve industry recognized certifications, in a unique hands-on learning environment with small cohorts averaging 20 students or less. Open Cloud Academy has two programs – The "Systems Administration" program focuses on Red Hat and Windows Server Operating Environments, networking, and other key infrastructure knowledge needed to become a System Administrator, as well as prepare students to gain knowledge required to obtain certifications in Network+ and RHCSA. The "Cybersecurity" program, which provides a high-level understanding of the main aspects of cybersecurity, and provides targeted skills and knowledge around managing risk, applying best practices in the networking and operating environment to maintain a secure network, also prepares students to gain knowledge required to obtain certifications in Security+ and CISSP.

TRAINING PROVIDER TYPE:

- Private (For-Profit) Training Provider

ORGANIZATION CURRENTLY TRAINS FOR THE FOLLOWING OCCUPATIONS:

- Computer User Support Specialist
- Information Security Analyst

TOP PROGRAMS THAT LEAD TO EMPLOYMENT IN IT AND CYBERSECURITY JOBS:

- Systems Administration Learning Track
- Cybersecurity Learning Track

LARGEST EMPLOYERS WHO HAVE HIRED PROGRAM GRADUATES:

Liquid Web, WPengine, rackspace, PSecure, accenture

AVERAGE COST PER PARTICIPANT:

- $8,000 for SysAdmin and $16,000 for Cybersecurity

AVERAGE COMPLETION TIME:

- 3 Months

WHEN ARE CLASSES OFFERED?

- Monday-Friday, During daytime business hours

ENTRY REQUIREMENTS FOR INCOMING STUDENTS:

- Students must be 18 years of age and possess a High School diploma or GED. As a pre-requirement, students must take an aptitude assessment prior to admission.

ADDITIONAL PREREQUISITES?

- The Cybersecurity program requires students to have Network+ Cert or pass Network Fundamentals exam

POST-COMPLETION JOB PLACEMENT AND EMPLOYMENT SUPPORT:

- Open Cloud Academy coordinates employer meet & greets and hosts resume building sessions for students in the program. Students who graduate from the program are regularly considered for interviewing for open jobs at the Rackspace corporate headquarters in San Antonio, TX.

SOLUTIONS AND RECOMMENDATIONS

CEMENTED ON CROSS-SECTOR PARTNERSHIPS

Skills required for the most in-demand occupations across information technology and cybersecurity are driven by and will continue to adapt to an accelerating pace of technological change. With this rapid change comes the constant need for upskilling/reskilling of workers as changes in technology redefine the work needed to support investments in technology and keep these investments secure from compromise. Aligning industry demand with education providers is a critical step to address future labor demands, critical and scarce skills, and how to adequately prepare for the demand.

Academic and business organizations in the San Antonio region are working closely in an efficient, collaborative, and transparent manner to identify supply gaps of in-demand occupation skills and make recommendations for curriculum updates and capacity building will support the effort to minimize regional skills gaps.

Industry representatives must be clear about their requirements to education providers, and also be comprehensive regarding what skills are scarce and what skills are required both within the realm of technical occupational skills and other essential skills including communication, creative thinking, and collaborative problem solving.

High-quality partnerships are ones that are mutually beneficial and based on trust and shared purpose.

In the pages to follow, SA Works will share six themes which we have uncovered as a result of our work that provide foundational ideas on how to address skills gaps and measurably improve the pipeline of skilled workers in both Information Technology and Cybersecurity.

EXPAND AND PROMOTE ACCELERATED LEARNING

There is an opportunity to build new capacity at post-secondary institutions (Community Colleges and 4-year Universities) in the form of certificate programs that focus on skills acquisition for the adult learner.

Additional recommendations include: increasing "2+2 Pathways" to make a 4-year degree more accessible and increase flexibility for students to "dip out" and then "dip back in" to higher education as technology changes occur and reskilling becomes necessary. This includes back-mapping programs that help High School Juniors and Seniors earn college credit and industry recognized certifications from accredited post-secondary programs. Community Colleges and 4-year Universities can enhance the value of certificates with internal articulation agreements by allowing certificate programs to count for credit towards 2-year and 4-year program enrollment.

Another pain point of organizations with a high demand for filling high-tech and cybersecurity jobs is the "management gap." The central point to this issue is that education providers should carefully evaluate existing certificate and post-secondary programs across technical and cybersecurity domains to ensure skills in Change Management, Risk Management, and Governance are embedded across curriculum. Integrating stronger Change Management and Risk Management capabilities into the "IT Department" will ensure a stronger execution of a company's IT strategy – these skills will make for a more competitive employee when combined with technical know-how.

Overall, growing high-quality, industry-recognized, portable, transparent credentials across various education and training providers, will benefit workers who need access to flexible training programs that are adaptable to their working lives.

EXPANDING AND EXTENDING INFORMATION TECHNOLOGY AND CYBERSECURITY CAREER PATHWAYS

Some of the biggest challenges specific to cybersecurity include: unclear career paths to cybersecurity roles, lack of widespread organizational knowledge of cybersecurity skills required to meet organizational requirements across multiple domains and the cost of education to prepare for a cybersecurity career.

Industry leaders have the opportunity to be at the forefront of articulating the various pathways available including recognizing middle skills pathways and validating them as job qualifications. Recognizing the multiple pathways as valid qualifiers of skills needed is a key starting point to preventing the exporting of jobs from San Antonio and increasing the visibility of the talent that we have right here in San Antonio. Already global employers like Google, IBM and others are removing the requirement for a 4-year degree in favor of industry recognized pathways to required skills that come in the form of industry-recognized certifications, 2-year programs offered in San Antonio, Certificate Programs, and other strategies, such as developing in-house training programs for new and incumbent employees who are hired for "fit," aptitude and desire to learn, job experience, or a combination of these elements.

Provide multiple pathways for students interested in pursuing a high-tech job after high school via:

- Industry recognized certifications
- Certification + Summer Internships
- Multiple Certifications + post-graduation Apprenticeship
- Certification(s) + College Credit

Ultimately, as a community, we can work towards optimizing pathways through multiple levels of education providers for potential employees at various phases in their career.

VETERANS AND TRANSITIONING SERVICE MEMBERS

Veterans and Transitioning Service Members are among the top sources for qualified candidates for the occupations featured in this report. In addition to a modernizing military that is leveraging technologies that are common in the modern workplace, members of the Military have a higher concentration of security clearances, which is increasingly important to employers who are required to manage sensitive data or who include federal contracting in their scope of work. With approximately 4,000 military personnel transitioning out across Bexar County annually, our community is well-poised to connect them with local employers seeking a skilled workforce with ready access to security clearances.

Already there are various efforts by our local chambers of commerce, Bexar County, City of San Antonio and other community-based organizations providing services to active and transitioning military members and their families to ensure that we live up to being "Military City USA" by providing wholistic services including job placement and training opportunities. It's important to continue to support and grow these retention programs in collaboration with local employers to facilitate job-matching.

K-12 EDUCATION POLICIES AND PRACTICE TO INCLUDE EXPANDING EXPERIENTIAL LEARNING OPPORTUNITIES

At the national level, roughly 70% of all students who start high school will enter the workforce without a baccalaureate degree; only 35% of high schools offer a computer science course; and there is a significant gap in the number of qualified computer science teachers, which requires a skill-up of current teachers.

There is a need to engage and train educators in IT & Computer Science (CS) to keep, attract and grow educator professionals. This is one of the biggest challenges in IT & CS secondary level skill acquisition, as skilled professionals typically earn more in the private sector than in teaching. There is an opportunity to grow professionals through micro-credentials, offering educators a more practical means of up-skilling. There are also some state legislative efforts underway to bring industry expertise into the classroom by allowing for expanded engagement of industry professionals, provided they undergo training.

A healthy amount of debate is occurring around the right path for high school students: direct-to-career or direct-to-college? Within K-12, there is also an opportunity to de-silo career technical education (CTE) to increase student interest and opportunity to pursue IT & CS pathways as current policies often do not provide an incentive for a student to pursue them. The College Board shared the need to scale career pathway offerings and integrate Advanced Placement (AP) into CTE to make them even more relevant to the workforce.

Earlier industry engagement can help solidify the value of education and successfully support student, educator and industry needs, goals, and pathway progression. The skillsets that are increasingly important across some of the key occupations in this report are acquired through practice and experience, not solely in the classroom. The very skills that are growing in demand according to our survey (complex problem solving, analytical, and team building) are the ones best acquired through experiential learning. Education providers can use project-based and team-based learning to engage students. In addition to industry-focused job shadows, internships and apprenticeships offer deep experiential learning across a large cross-section of students.

INNOVATIVE RESKILLING AND FUTUREPROOFING TODAY'S WORKFORCE FOR TOMORROW

How do individuals successfully manage their way from academic completion through the multiple job changes they will experience in their careers? And with the cycle of continuous learning predicted to be more and more non-credit, online, and in the workplace, how do future workers build upon their formal education as they progress through their careers, where lifelong learning is necessary and expected?

The ever-changing digital economy requires an updated take on workforce preparation. Whether companies are supporting training and certification efforts, or IT and cybersecurity pros are pursuing them independently, one obstacle rises to the top – professional development.

Employers can play an expanded leadership role in preparing talent for in-demand skills and competencies aligned with today's workforce needs by taking an active role in regularly communicating these requirements to institutions of higher education along with training and certification providers in their respective communities. And, there is an opportunity to step up in ways that have a meaningful influence on cybersecurity operations by expanding access to professional development opportunities inside and outside of the organization.

AT&T in 2013 launched a company-wide reskilling effort called "Workforce 2020"to retain rather than hire talent as technology advanced. To support this reskilling effort, AT&T created an online system, Career Intelligence, to help employees consider and navigate towards new internal career prospects. Today, more than half of its employees have completed a cumulative 2.7 million online courses in areas such as data science, cybersecurity, Agile project management and computer science. AT&T employees engaged in new skilling are twice as likely to be hired into a newer, mission-critical job within the company and four times more likely to make career advancement.

DEVELOP AN INTEGRATED WORKFORCE-PROVIDER NETWORK

This report is our first attempt to asset map education providers and their respective certification and degree programs preparing individuals for career in IT and cybersecurity. This asset map should be updated annually to include a list of providers, composition of their target client (e.g., adults transitioning careers, recent high school graduate, etc.), insight into their services, highlights of their funding and program requirements (if necessary), and other valuable information. It should be a public tool available for social-assistance, community-based, and governmental organizations to use as a reference to direct citizens. SA Works or another lead organization should take responsibility for regularly updating the matrix and ensuring that it is readily available to wide audiences across the community including employers.

Education providers and workforce development organizations play a key role by building networks for rotational programs within and across industries and developing new ways for workers to explore career pathways using emerging technology. Workforce development organizations can achieve improved outcomes for workers through strengthened employer relationships and improved longevity of impact.

Education and workforce partners often work with dislocated workers, at-risk youth, and historically disadvantaged populations to help improve their employability skills. How can they validate to employers what they have learned translates to mastered skills? How can employers easily understand the skills individuals possess and make good, informed hiring decisions? And more importantly, how do employers articulate the skills they need individuals to possess?

Since many workforce partners are measured on the number of participants completing training programs and finding and keeping employment at higher wages, the use of quality credentials in the training programs they fund is extremely important. Workforce organizations work with education and training providers to help connect credentials to reduce training time, enabling individuals to be employed more quickly.

Communication with continuous improvement will require workforce development players to work together and adopt third-party, quality credentials and competencies needed for training candidates to achieve success in the workplace.

Employers can not only buy-in to but also lead the efforts for credentials to be validated and gain traction. This will demonstrate a return-on-investment for both employers and job seekers. Job seekers need to know that by achieving these credentials, they are more likely to attain a job or their next job. Already, we are seeing some employer relationships developing in preparation of entry-level jobs as in the case of Accenture Federal Services which presents an opportunity to scaling this promising private sector solution to closing the skills gap.

There is no standard process for employers to easily communicate changes in skills and competencies in real time so they can be quickly adopted by educators and trainers into viable academic and training programs—whether credit or non-credit—with easy on- and off-ramps for the working learner. This report could be the first step with an opportunity for improvement.

CONCLUSION

The essential ingredient in robust workforce development is collaboration. Many communities develop good plans on paper, but very few build the effective relationships or have the right leadership in place in order to implement them. While many communities may think they have these partnerships, they do not have an effective joint effort unless the roles and responsibilities for each partner are defined around common goals and metrics.

This report and the accompanying summit are intended to kick-off that collaboration—working towards a common goal.

Educational institutions can utilize the information provided by employers in this report to align their certification and degree programs to produce a workforce prepared for the jobs of today and tomorrow.

Companies selecting San Antonio are adding new jobs that span education levels, technical and essential skills that will challenge and strengthen San Antonio's competitive workforce of the future. Key economic development wins to include a combination of company relocations and expansions like EY, USAA, BD, OKIN BPS and Victory Capital deciding to invest in San Antonio cite San Antonio's skilled workforce as a critical component of their decision.

San Antonio's ability to collaborate across sectors and organizations is what sets us apart. Recruitment, retention, and expansion of business and industry requires a skilled workforce that is aligned to the needs of employers. Educating employers on the value of credentials and using a standard process connected to programs of studies in high schools and higher education institutions is a good fit within an economic development, employer retention strategy.

What will follow next for our community is to improve performance across all partners, and SA Works is committed to identifying industry needs and supporting cross-sector solutions that can support mass industry adoption of credentials along with return-on-investment data and metrics that validate quality talent pipeline development partnerships, processes, and programs.

There is a willingness among our key education institutions, workforce partners and public sector stakeholders to expand and develop new employer-driven workforce partnerships and we are READY to support the business community's commitment to prepare and train current and future workers for the ever-changing talent marketplace.

AS PART OF THE UNIVERSITY OF TEXAS SAN ANTONIO'S (UTSA) **CONTINUED EVOLUTION**, THE UNIVERSITY **SECURED A SIGNIFICANT $70 MILLION INVESTMENT** TO ESTABLISH A NATIONAL SECURITY COLLABORATION CENTER AND A SCHOOL OF DATA SCIENCE, both of which will be housed in the redeveloped downtown campus. UTSA President Dr. Taylor Eighmy said it best, "by creating an ecosystem that brings together the business strengths of our community and the research expertise of UTSA, we will establish San Antonio as the Silicon Valley-equivalent for data science, information management, and cybersecurity.

APPENDIX /SOURCES

This report references primary data gathered by survey from local information technology and cybersecurity employers, as well as supporting data from Emsi to identify the top in-demand information technology and cybersecurity occupations in San Antonio.

INDUSTRY AND TRAINING PROVIDERS SURVEYS AT-A-GLANCE:

INDUSTRY SURVEYS

The top three Information Technology and cybersecurity occupations in this report were identified via primary source through a confidential survey completed by over 30 small, medium, and large organizations in the San Antonio metropolitan area who specialize in providing information technology or cybersecurity services, or maintain a dedicated staff of information technology and cybersecurity professionals. San Antonio area employers were asked to identify their top in demand occupations as well as the technical and other scarce and essential skills which are required to be successful on the job.

As an overlay to the employers' primary data, the San Antonio Economic Development Foundation also leveraged labor market data from Emsi, which tracks data points from dozens of government sources including the Bureau of Labor Statistics (BLS), the Employment and Training Administration (ETA), as well as Job Posting Analytics from job postings across multiple sources within the San Antonio Metropolitan area for Information Technology and Cybersecurity related occupations.

In addition to the top 3 Occupations identified by area employers, occupations identified as "Bright Outlook Jobs," were added to this study. "Bright Outlook Jobs" are identified as jobs being added to the San Antonio Metropolitan area at a more rapid pace than the national job growth rate, using datapoints from Emsi as support.

TRAINING AND EDUCATION PROVIDER SURVEYS

Also included in this study is a section on area education providers with programs aligned to the occupations identified in this study. Primary data provided for San Antonio-area education providers originates from completed surveys by education providers in the San Antonio area who provide programs intended to prepare individuals for skills which are designed to lead to a career in IT and Cybersecurity. In total, 19 institutions are featured in this study, including Public and Nonprofit Universities, Community Colleges, and For-Profit training providers. Institutions surveyed were asked to provide feedback on which of their programs aligned with information technology and Cybersecurity most often lead to employment in the field. Additional information, such as what local companies hire their graduates was also included in the survey. Additional data on education and training providers was gathered through public sources to supplement our reported results. The findings of this study are intended to inform individuals including employers, career seekers, education providers, policy makers, and other interested parties of the top in-demand occupations in Information Technology and cybersecurity as well as provide an education provider asset map demonstrating the vast array of programs available to provide individuals with the skills training required for these occupations.

ADDITIONAL SOURCE:

This report uses data from Economic Modeling Specialists, Intl. (EMSI), and independent industry lead primary sources. EMSI is a demographic service provider and economic indicator of labor market data in the United States. EMSI produces its data based on data supplied by publicly accessed sources from the Bureau of Labor Statistics, US Census Bureau and US Department of Education National Center for Education Statistics Integrated Postsecondary Education Data System (IPEDS), and Texas Workforce Commission. The report and datasets are supplemented with secondary data using analytical processes applied to data reported from EMSI and proprietary data sources listed above. Job postings are collected from various sources and enriched to provide information such as standardized company name, occupation, skills, and geography. EMSI occupation employment data are based on final EMSI industry data and final EMSI staffing patterns. Wage estimates are based on Occupational Employment Statistics (QCEW and Non-QCEW Employees classes of worker) and the American Community Survey (SelfEmployed and Extended Proprietors). It should be noted that data collected is subject to revisions. Data, reports, and forecasts included in EMSI Apps and Licensed Datasets may differ significantly from actual circumstances or outcomes. In addition, SA Works cannot make any representation of the completeness of data aggregated from any source. Additionally, data pertaining to jobs and job posting are subject to change through adjustments within approximately nine months after publication.

DATA DEFINITIONS:

AGILE (SOFTWARE DEVELOPMENT) refers to a group of software development methodologies based on iterative development, where requirements and solutions evolve through collaboration between self-organizing cross-functional teams.

"BRIGHT OUTLOOK" OCCUPATIONS are occupations identified by the SA Works team as occupational codes which represent jobs which are expected to grow or add job openings at a more rapid pace than the national growth rate. These jobs were not identified in surveys by local employers however were identified through secondary data sources through EMSI.

CLOUD is referred to as a technological solution using a network of remote servers hosted on the Internet to store, manage, and process data, rather than a local server or a personal computer.

CYBERSECURITY refers to measures taken to protect a computer or computer system (as on the Internet) against unauthorized access or attack.

DEVOPS is a software development methodology that combines software development with information technology operations. The goal of DevOps is to shorten the systems development life cycle while delivering features, fixes, and updates frequently in close alignment with business objectives.

ECONOMIC MOBILITY is the ability of an individual, family or some other group to improve their economic status—usually measured in income.

ESSENTIAL SKILLS are the occupation-specific skills appearing most frequently in job postings which are often referred to as "soft skills".

HIRES reflect when an individual's Social Security number appears on a company's payroll and was not there the quarter before as reported by the U.S. Census Bureau's Quarterly Workforce Indicators (QWI) program.

INDUSTRY CERTIFICATION is a process of program evaluation ensuring that individual programs meet industry standards in the areas of curriculum, teacher qualification, lab specifications, equipment, and industry involvement. A program industrially certified, receives a stamp of excellence.

MARKETABLE SKILLS are interchangeably used with "Essential Skills," which are the occupation-specific skills appearing most frequently in job postings which are often referred to as "soft skills".

NETWORK APPLIANCE refers to a specialized electronic device that plugs into a network that is optimized for one specialized purpose (this is in contrast to a general-purpose computer such as a personal computer, laptop, or tablet that can be re-purposed simply by changing the software).

OCCUPATIONAL SKILLS are a set of knowledge and skills that employees need for a specific job or occupation.

PROGRAMMING LANGUAGE is a formal language, which comprises a set of instructions used to produce various kinds of output. Programming languages are used in computer programming to create programs that implement specific algorithms.

SKILLS GAP refers to the perceived mismatch between the needs of employers for skilled talent and the skills possessed by the available workforce.

TRANSITIONING SERVICE MEMBER is defined as an individual in active duty status (including separation leave) who registers for employment services and is within 24 months of retirement or 12 months of separation.

WEB-BASED APPLICATION is any program that is accessed over a network connection using HTTP, rather than existing within a device's memory. Web-based applications are also known as web apps.

WORKFORCE AVAILABILITY refers to the sufficient supply and appropriate stock of workers, with the competencies and skills to match the needs of employers.

EDUCATION PROVIDER INFORMATION:

HALLMARK UNIVERSITY

School of Information Technology: https://hallmarkuniversity.edu/schools/information-technology/

PURDUE GLOBAL

Information Technology Program Information: https://go.purdueglobal.edu/infotech/ms
Cybersecurity Program Information: https://go.purdueglobal.edu/infotech/bs-cybersecurity

OUR LADY OF THE LAKE UNIVERSITY

CISS Program Information: **http://www.ollusa.edu/s/1190/hybrid/18/wide-hybrid-ollu.aspx?pgid=7804&gid=1**

ST. MARY'S UNIVERSITY

Academic Programs: **https://www.stmarytx.edu/academics/programs/**
Tuition Information: **https://www.stmarytx.edu/admission/financial-aid/tuition/**

TRINITY UNIVERSITY

Department of Computer Science:
https://new.trinity.edu/academics/departments/computer-science/majors-minors
University Admissions: **https://new.trinity.edu/admissions-aid/applying-trinity/selection-criteria**
Tuition Information: **https://inside.trinity.edu/student-financial-services**

TX A&M UNIVERSITY SAN ANTONIO

Undergraduate Programs:
http://www.tamusa.edu/academics/college-of-arts-and-sciences/undergraduate-degrees.html
Standard Admissions Requirements: **http://www.tamusa.edu/admissions/index.html**

UNIVERSITY OF THE INCARNATE WORD

Computer Information Systems Academic Programs: **http://www.uiw.edu/smd/cis/**
Standard Admissions Requirements: **http://www.uiw.edu/admissions/index.html**

UNIVERSITY OF TEXAS SAN ANTONIO

Cybersecurity Programs: **http://www.utsa.edu/spotlights/cybersecurity/**
Tuition Information: **http://www.utsa.edu/fiscalservices/tuition.cfm**
Standard Admissions Requirements: **http://www.utsa.edu/admissions/**

ALAMO COLLEGES – NORTHEAST LAKEVIEW

Program Information: https://www.alamo.edu/nlc/
Admissions Requirements: https://www.alamo.edu/admission--aid/
Tuition Information: https://www.alamo.edu/admission--aid/paying-for-college/tuition-and-fees/

ALAMO COLLEGES – NORTHWEST VISTA

Program Information: **https://www.alamo.edu/nvc/**
Admissions Requirements: **https://www.alamo.edu/admission--aid/**
Tuition Information: **https://www.alamo.edu/admission--aid/paying-for-college/tuition-and-fees/**

ALAMO COLLEGES – PALO ALTO COLLEGE

Program Information: **https://www.alamo.edu/pac/**
Admissions Requirements: **https://www.alamo.edu/admission--aid/**
Tuition Information: **https://www.alamo.edu/admission--aid/paying-for-college/tuition-and-fees/**

ALAMO COLLEGES – SAN ANTONIO COLLEGE

Program Information: **https://www.alamo.edu/sac/**
Admissions Requirements: **https://www.alamo.edu/admission--aid/**
Tuition Information: **https://www.alamo.edu/admission--aid/paying-for-college/tuition-and-fees/**

ALAMO COLLEGES – ST. PHILIP'S COLLEGE

Program Information: **https://www.alamo.edu/spc/**
Admissions Requirements: **https://www.alamo.edu/admission--aid/**
Tuition Information: **https://www.alamo.edu/admission--aid/paying-for-college/tuition-and-fees/**

CODEUP

Program Information: **https://codeup.com/**

DC INDUSTRIES

Program Information: **https://dc-industries.net/**

DYNAMIC ADVANCEMENT

Program Information: **https://dynamicadvancement.com/**

MICROSOFT SOFTWARE & SYSTEMS ACADEMY

Program Information: **https://worldwide.erau.edu/microsoft-software-systems-academy/**

NEW HORIZONS COMPUTER LEARNING CENTERS

Program Information and Class Schedule: https://www.nhsanantonio.com/resources/pdf-course-schedule

OPEN CLOUD ACADEMY

Program Information: https://opencloudacademy.rackspace.com/

saedf
san antonio economic development foundation