

JANUARY 2015

AN IN-DEPTH ANALYSIS OF THE SOFTWARE INDUSTRY IN **GREATER PHOENIX**

FINDINGS FROM THE GREATER PHOENIX ECONOMIC COUNCIL MARKET INTELLIGENCE PROGRAM



Greater Phoenix
ECONOMIC COUNCIL

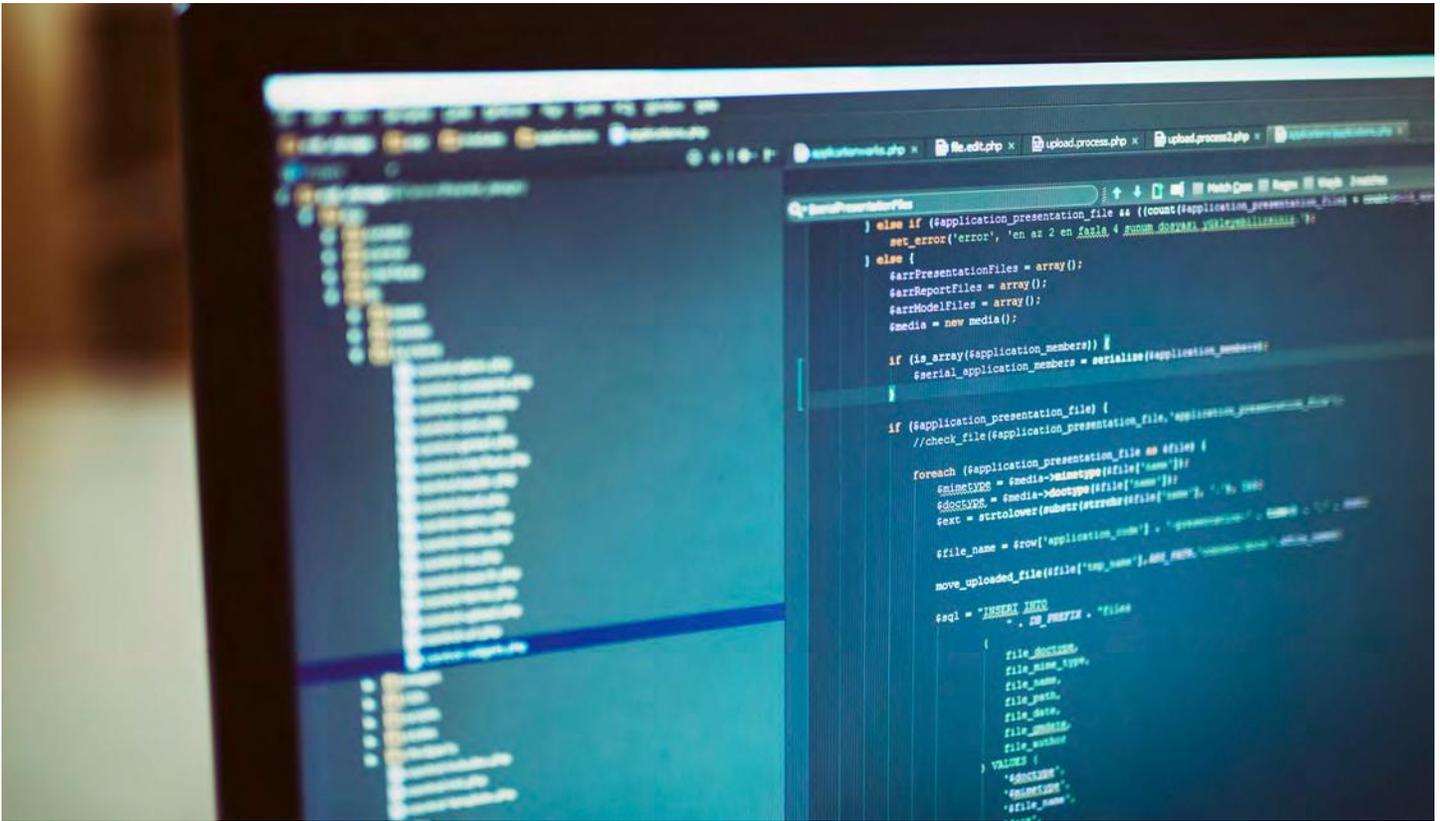
PREFACE

This report is a product of the Greater Phoenix Economic Council (GPEC) Market Intelligence Program, a collaborative effort with GPEC's 22 cities and towns, Maricopa County and regional private-sector stakeholders.

Launched in 2012, the Market Intelligence Program is designed to support the region's efforts to retain and help grow local businesses by working with GPEC communities and other regional stakeholders.

The detailed analyses of industry trends are of significant value to communities and enable economic development professionals to engage industry executives in in-depth discussions regarding the opportunities and threats facing the industry.

Following the aerospace and defense analysis and pre-sequestration report – *The State of Greater Phoenix's Aerospace and Defense Industry* – GPEC collaborated with the Economic Development Directors Team (EDDT) to analyze the Information Communications Technology (ICT) sector with a significant emphasis on the software industry.



THE NEW ERA OF NEXT-GENERATION COMPUTING AND ELECTRONICS INCLUDES A SHIFT TO SOFTWARE AND “CLOUD COMPUTING.”

INTRODUCTION

The Information and Communication Technology (ICT) sector represents the convergence of telecommunication and information technology. It has ushered a new era of next-generation computing and electronics, the Internet of Things, cloud computing and big data. Key implications rising from this convergence include more powerful integrated circuits or “chips”; diffusion of web-based services in increasingly broader areas of economic and social activity; a focus on software and “cloud computing”; increased connectivity and computing; and the generation of enormous amounts of data (“big data”) for commercial and public uses.

The ICT sector is significant to the current and future Greater Phoenix economy. It represents a strategic opportunity to drive innovation and technology development for sustained economic growth.

Nearly 70,000 people are currently employed in ICT industries across more

than 3,770 establishments, contributing an excess of \$11 billion to the Gross Regional Product in 2014. ICT is projected to reach 76,000 jobs within the next five years. By sub-industry categories, custom computer programming services is the largest with more than 10,800 jobs and it is projected to add 4,410 jobs by 2019. Other high growth ICT industries include computer systems design services, which will add 2,180 jobs, and data processing, hosting and related services, which will add 1,220 jobs by 2019.

Greater Phoenix has more than 66,000 qualified software workers employed by ICT and other firms, representing a deep knowledge and skills pool necessary for productivity and innovation. The ICT workforce is highly concentrated in the region compared to the national average and is poised to grow by 14 percent in the next five years, 4.5 percent faster than the national average. 🍷

GREATER PHOENIX ICT BY THE NUMBERS

ICT ESTABLISHMENTS

3,770

DIRECT EMPLOYMENT IN ICT

66,912

JOBS MULTIPLIER

3.13

ECONOMIC OUTPUT

\$11 BILLION

INDUSTRY CONCENTRATION (LOCATION QUOTIENT)

1.2

MEDIAN EARNINGS PER JOB (2014)

\$106,033

EXPECTED JOB GROWTH BY 2019

14.4%

Source: Economic Modeling Specialists International (2014)

THE SOFTWARE INDUSTRY

An integral component of the ICT sector is the software industry, which includes companies that provide systems applications and services such as operating systems, network and database management, processing, and other systems software; and companies that design and build computer and web-based software applications to support business productivity (e.g., CRM) and directly for users/consumers (e.g., games or social media apps). Also contributing to industry growth are companies responding to the global upsurge of mobile devices. These companies provide products and services that enable secure mobile communications and enterprise mobile strategies.

The global market for software is robust and will grow at a rapid pace. Globally, the software industry reached total revenue of \$554.5 billion in 2013, representing a compound annual growth rate (CAGR) of 11.3 percent over a five-year period between 2009 and 2013.

The United States dominates 35 percent of the global software market with leading companies such as Microsoft, IBM and Oracle. Also the domestic U.S. software market is growing at a healthy pace of 7 percent CAGR and will reach \$244 billion by 2018.¹

However, significant opportunity for growth is outside the United States. The Asia-Pacific region accounts for nearly half the global software market and is projected to reach \$449 billion by 2018. The European market share is about 18 percent and is forecasted to reach \$117 billion in 2018.

The strong market performance is matched by intense venture capital activity. According to CB Insights, in the last two years Internet, mobile, telecommunications and software startups attracted more than 100,000 deals valued at \$65 billion, globally.

These trends demonstrate an opportunity for Greater Phoenix to leverage its strengths and capacity for entrepreneurship, innovation and exports, and strategically promote software as one of the key drivers for economic growth. ☺



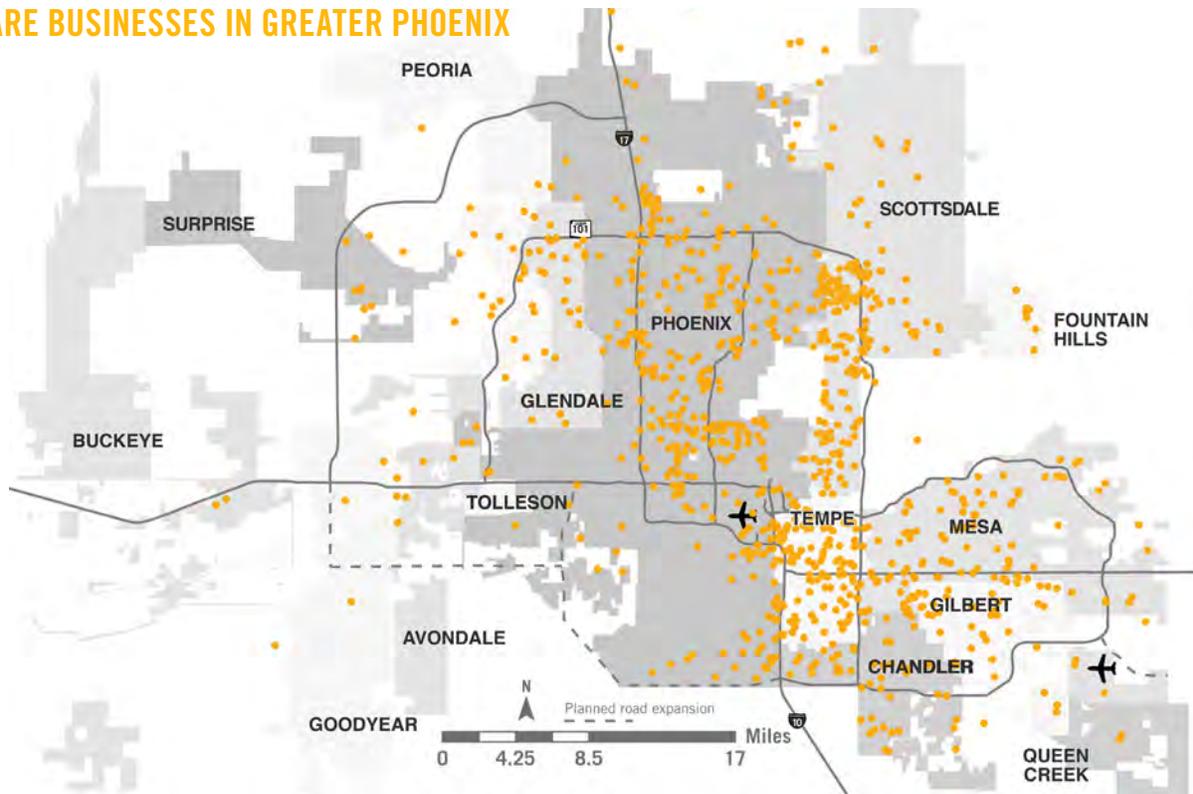
IN THE LAST TWO YEARS TELECOMMUNICATIONS, INTERNET, MOBILE AND SOFTWARE STARTUPS ATTRACTED MORE THAN 100,000 DEALS VALUED AT \$65 BILLION.

SOFTWARE EMPLOYMENT IN TOP MOUNTAIN WEST REGIONS

MSA	2014 Employment	2014 - 19 Employment Growth Projection	Median Hourly Earnings
Los Angeles-Long Beach-Anaheim, CA	177,988	5%	\$41.76
Dallas-Fort Worth-Arlington, TX	133,346	9%	\$38.78
Seattle-Tacoma-Bellevue, WA	129,844	12%	\$49.35
San Francisco-Oakland-Hayward, CA	128,201	13%	\$47.87
San Jose-Sunnyvale-Santa Clara, CA	112,991	11%	\$55.89
Houston-The Woodlands-Sugar Land, TX	86,083	9%	\$41.26
PHOENIX-MESA-SCOTTSDALE, AZ	66,126	14%	\$37.37
Denver-Aurora-Lakewood, CO	64,073	9%	\$40.57
Austin-Round Rock, TX	55,082	11%	\$38.33
San Diego-Carlsbad, CA	52,780	8%	\$41.38
Portland-Vancouver-Hillsboro, OR-WA	41,383	9%	\$36.80
Salt Lake City, UT	23,479	14%	\$35.47

Source: Economic Modeling Specialists International (2014)

SOFTWARE BUSINESSES IN GREATER PHOENIX



SOFTWARE INDUSTRY IN GREATER PHOENIX

More than 2,800 establishments, employing 29,000 workers, are directly engaged in software publishing, computer systems design, custom programming, data processing and hosting, Internet publishing and related services in Greater Phoenix.²

Notable companies include global brands such as IBM, Avnet, JDA Software, and Insight; and growth companies such as LifeLock, Infusionsoft, and GoDaddy, and recent startup successes such as WebPT, 41st Parameter, Parchment and Axosoft.

In addition, the region has attracted technology and software development operations of global companies such as General Motors, American Express, eBay and PayPal.

Recent expansions from Zenefits, Yelp and Weebly, for example, contribute to the region's innovation ecosystem and highlight business advantages for growth-oriented tech companies that have chosen Greater Phoenix as a regional hub. ☺

GREATER PHOENIX SOFTWARE EMPLOYMENT BY OCCUPATION

	Jobs		Median Hr.	Earnings	LQ
	2014	2019	% Change 2014-19		
Software Developers, Applications	10,388	12,155	17%	\$42.02	1.16
Computer User Support Specialists	10,295	11,896	16%	\$22.17	1.26
Computer Systems Analysts	10,226	11,917	17%	\$38.84	1.42
Network and Computer Systems Administrators	5,225	5,769	10%	\$37.57	1.05
Computer and Information Systems Managers	5,098	5,821	14%	\$56.18	1.15
Software Developers, Systems Software	5,038	5,915	17%	\$47.60	0.97
Computer Network Support Specialists	4,107	4,338	6%	\$31.04	1.72
Computer Programmers	3,994	4,540	14%	\$33.76	0.89
Database Administrators	2,701	2,953	9%	\$35.61	1.71
Web Developers	2,625	3,043	16%	\$26.04	1.32
Computer Network Architects	2,529	2,766	9%	\$49.37	1.31
Computer Occupations, All Other	1,620	1,790	10%	\$30.89	0.58
Information Security Analysts	1,618	1,977	22%	\$42.10	1.51
Multimedia Artists and Animators	552	545	(1%)	\$15.23	0.68
Computer and Information Research Scientists	109	139	28%	\$54.36	0.31
TOTAL	66,126	75,563	14%	\$37.37	

Source: EMSI, 2014

TOP SOFTWARE FIRMS IN GREATER PHOENIX

Ranked by total number of local employees

Firm	Location	Local, full-time employees	Local software engineers and programmers	Types of software applications	Year founded locally
Infusionsoft	Chandler	547	60	Sales and marketing software built for small businesses	2001
ICM Document Solutions	Phoenix	152	16	Document management, enterprise content management, accounts payable automation	1988
41st Parameter	Scottsdale	130	30	Online fraud prevention and device recognition	1988
Business and Decision NA	Scottsdale	125	55	Business intelligence and customer relations management software	1998
Gate6	Phoenix	93	46	Custom e-commerce, custom business automation apps, consumer apps, mobile	1996
Meltmedia	Tempe	60	30	Custom development and analytics software	2000
Signature Technology Group Inc.	Phoenix	58	8	Software implementation and migration services	1990
Computer Guidance Corp.	Scottsdale	45	25	Construction enterprise resource planning software, cloud computing	1981
Levementum	Chandler	45	30	Customer relationship management, e-commerce	2006
IMS Health	Chandler	44	28	Customer relationship management and marketing applications, software-as-a-service, iOS mobile apps	2005
TTI Success Insights Inc.	Scottsdale	35	6	Talent assessment software	1989
Ron Turley Associates	Glendale	29	8	Desktop-based client application used to gather and report data specific to fleet operations	1981
Kutta Technologies Inc.	Phoenix	26	24	Unmanned vehicle controllers, communications systems, remote video transceiver	2001
Isos Technology	Tempe	25	22	Enterprise e-commerce application, enterprise java applications, system integrations	2005
Systems Technology Group Inc.	Phoenix	20	15	Business applications integrating with legacy applications, using the latest internet and mobile technologies	1994
The Chatfield Group Inc.	Mesa	20	18	Business applications integrating with legacy applications, customer relationship management, e-commerce	2001
Symmetry Software	Scottsdale	20	8	Payroll withholding tax solutions	1984

Source: The Book of Lists 2014-15, Phoenix Business Journal

METHODOLOGY: INDUSTRY ENGAGEMENT

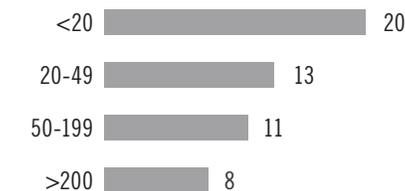
On-site meetings were conducted with 51 software companies located throughout the region. GPEC staff and economic development professionals from member cities and towns met with c-level executives over several months in the spring of 2014.

The software companies ranged in size from small (employing 50 or less) to mid-sized companies (employing 50 to less than 200), with eight companies employing more than 200. Most of the companies operate in highly specialized market niches where competition is low-to-moderate. ☺

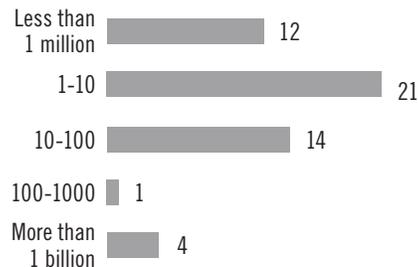
SOFTWARE COMPANIES INTERVIEWED

Aerospace Engineering & Aviation Software	2
Business Intelligence, Analytics, Interaction & Performance Management Software	18
Content Management	2
Custom Computer Programming Services	2
Data Center Infrastructure Management Software	2
Data Management Software	1
Data Processing, Hosting, and Related Services	2
Design Software	1
Education & Training Software	4
Financial Services Software	1
Healthcare Call Center Solution	1
Healthcare Data Software	8
Human Resource Management Software	1
Marketing Software	1
Cyber Security Systems Services Software	5
TOTAL	51

COMPANIES BY SIZE



COMPANIES BY REVENUE (\$ MILLION)



FINDINGS

1. Software businesses in Greater Phoenix are poised to grow.

An overwhelming majority of the companies indicated they are experiencing high revenue growth. As a result, they have plans to expand and hire more workers in the near term. Some reported double and triple-digit year-over-year growth rates.

98% OF COMPANIES ARE GROWING

2. Software is an export industry with a national and global customer base.

With nearly 4 million people and the 15th largest economy in the United States, Greater Phoenix is a large and robust market for software companies. While serving the local market is the main revenue driver for some, the majority of software companies sell to national and global markets.

Many leading computer software firms

generate up to 50 percent or more of their revenues in international markets.³

3. Greater Phoenix is emerging as a software hub, accelerated by an enriched innovation ecosystem.

According to CB Insights, since 2013 72 Greater Phoenix software companies have received venture and equity capital, and 18 companies were acquired. Ability to attract new investment capital is critical to a dynamic industry like software, where technologies evolve and change rapidly, and maintaining an edge over competitors requires regular reinvestment to upgrade equipment, capabilities and skills.

Capabilities needed to capitalize on market opportunities in the integrated Internet economy have been slow to materialize in Greater Phoenix, and some executives have suggested slow transition to new emerging markets is motivating creative workers to relocate outside the region.

Still other industry insiders celebrate the

rapid progress in the innovation ecosystem that has produced hundreds of new software and technology startups in the last few years. Indeed, companies such as WebPT, Parchment, Appointment Plus and others are successful examples of an active startup and growing software community.

Mature firms, by attracting talent to the region, contribute to strengthening the cluster.

Mature firms often compete nationally and internationally to attract top talent. Once established in the region, experienced developers could decide to become entrepreneurs in their own right, and take advantage of the region's innovation assets and ease of doing business.

Workforce talent can keep a firm tied to a particular location.

It is difficult for software companies to find the right talent with the right cultural fit. Often companies must make significant investment in developing their programmers and developers, remaining

very conscious of their employee's culture and lifestyle needs. Valuable employees are often recruited away by other firms thus, high growth companies carefully choose to open offices and facilities in locations that can offer professional development and recreation opportunities outside of work for their employees as well as mobility and commuting opportunities as a retention strategy. Proximity to incubators, accelerators, co-working spaces and overall proximity to other similar firms was also cited as a factor in determining where they do business.

4. The region does not have a sufficient number of qualified workers to support future growth in the software industry.

Finding qualified and talented software developers is the number one challenge and priority for software companies nationally as well as for those operating in the Greater Phoenix region.⁴

Companies consistently point out the current pool of applicants lack a combination of technical and soft skills sought by firms, and competition for qualified talent is contributing to higher wages in the software industry.

Local executives expressed several challenges that they face in finding skilled talent:

- Arizona is an attractive place to recruit new hires from out of state. But Arizona is not competitive for senior professionals with experience and specialized skills.
- It is more difficult to find developers with consumer software experience in Arizona than to find developers with enterprise software experience.
- New entry-level hires require significant on-the-job training because they lack sufficient code development experience. There is also a general lack of basic business and finance knowledge among workers entering the job market.
- Arizona's educational system (public and private) has not produced a sufficient number of graduates to create a competitive job market. Graduates



CO-WORKING SPACES LIKE CO+HOOTS HELP GREATER PHOENIX ENTREPRENEURS START AND BUILD COMPANIES.

with computer science and software engineering degrees need additional training to become job ready.

Recent Bureau of Labor Statistics data reinforce the industry's experience. The Greater Phoenix region lags behind other top innovation regions for concentration of computer and mathematics occupations. There are 37 computer and mathematics occupations per 1,000 jobs in Greater Phoenix, compared to 65 in Austin and 123 in San Jose.

Other observations from local software industry executives provide additional insights into current labor market conditions in Greater Phoenix and implications for economic growth.

Greater Phoenix has highly skilled software developers that rival the best in other top technology markets. However, available talent is diluted across different industries and they work in highly-customized technology spaces where the skills are not easily transferable. It was noted the region is still a legacy hardware market with most innovators having experience in embedded software tied to aerospace and defense markets.

The region's firms compete nationally for workers with specialized software development skills. Nationally there is a shortage of software

developers. The skills required for any particular position ranges across a variety of platforms. However, most of the local firms clearly preferred experienced developers who could immediately add value to the team. The top five skills in demand are almost the same nationwide:⁵

- Java/J2EE/Java Developer
- C/C++/Objective C/C#-
- Javascript/CSS/SASS/HTML/HTML5
- SQL/SQL Server/MSSQL
- .Net/ASP

Generally, employers prefer developers with computer science degrees, certificates or technical credentials; however, experience is highly desirable. Employers also expect developers to be up to date on current technologies, familiar with several operating systems, servers, tools, Android, Java/web services, and possess diagnostic skills.

Employers value soft skills as much as technical skills. Local software executives stressed that soft skills such as communication, time management, customer service, business domain expertise, teamwork, and ability to adapt to new and emerging industry standards are highly desirable.

High growth and innovative companies look for people that can effectively communicate and work in teams, can translate customer feedback into product



ICT EXECUTIVES IN GREATER PHOENIX INDICATED THEY CHOSE TO STAY AND START THEIR BUSINESS IN ARIZONA BECAUSE OF ARIZONA'S CLIMATE, LANDSCAPE, OUTDOOR LIFESTYLE AND AFFORDABILITY.

improvements, and understand and contribute to business objectives.

5. Venture capitalists are actively seeking deals in Greater Phoenix but expert assistance is needed to help companies navigate through the venture capital funding process.

Less than 1 percent of venture capital in the United States is invested in Greater Phoenix businesses. However, low volume of deals does not accurately reflect actual levels of interest from venture capitalists. According to local software executives, in- and out-of-state venture capital firms actively seek deals in the region. In fact, companies including Celltrust, Parchment, Infusionsoft and others have successfully raised significant venture capital funding to scale growth.

Venture capital firms regularly contact local technology companies and monitor their growth. The frequency of calls increases when a company reaches \$2 million in revenue. When a company reaches \$4-5 million in revenue, communication is elevated to senior individuals within the venture capital firms to discuss potential deal opportunities.

Among the 51 software companies interviewed, there are two key trends with respect to venture capital funding.

Lifestyle companies in niche markets are not considering venture capital funding. The executives of a “lifestyle company” operating in a niche market with little or no pressure to grow quickly place higher value on life-work balance. They make calculated business decisions to maintain full control of their company while choosing to grow the company at a slower pace rather than accelerate growth with venture capital funding.

Lack of experience with venture capital constrains software companies from seeking venture capital funding. A venture capital deal is a complex process. Several executives commented that they would have benefited from expert assistance to help them through the venture capital funding process and negotiating a deal. Several firms turned down a deal because the equity requirement was too high or the investment was too small compared to the complexity of the deal. The lack of experience with venture capital impedes companies from closing venture capital deals.

6. Business operating environment and quality of life are important to software companies. For the majority of export-oriented companies, location decision is tied to a complex matrix of factors, including talent,

supply chain and business operating environment. Local executives indicated that they started and grew their business in Greater Phoenix because of the region’s low-cost operating environment and quality of life. They also attributed personal networks as one of the key business location factors.

To remain price competitive, operating costs must remain low. Keeping operating costs low is important for software companies to maintain or gain market share. Software is a globally competitive market with relatively low barrier to entry. This creates an environment where even marginal price changes can have significant consequences. For local software companies, taxes are an important factor in operating cost, but wages and mandated payroll costs are primary concerns.

Quality of life drives firms to start and grow their business in the region. The Greater Phoenix region is known for its quality of life. Several executives indicated that they came to Arizona because family, friends and people in their network had an Arizona connection. They chose to stay and start their business in Arizona because of Arizona’s climate, landscape, outdoor lifestyle, and affordability.☺

RECOMMENDATIONS

1. Facilitate the formation of more targeted workforce training and education programs to meet current and future workforce needs of the software industry.

Finding qualified workers to hire is the most pressing issue for software companies of all sizes operating in the Greater Phoenix region. Every executive stressed that it is difficult to hire qualified and experienced software developers and the state is not producing a sufficient number of graduates with computer and software skills. However, engineering a workforce solution that fits the needs of these companies is challenging. The needs and requirements of the software industry are broad and constantly evolving, including development of technical coding competencies, and soft and transferable IT skills. Hence, it is recommended to:

- Encourage and facilitate information sharing between the software industry – individual firms, coalitions, and industry groups and associations – and public and private education service providers to address workforce issues at regional and state levels.
- Encourage and facilitate the build-up of multiple strong, diverse and industry validated workforce training and education programs focusing on bridging the job readiness gap for software developers and other IT professionals.

2. Accelerate technology business formation and growth by expanding and targeting the region's entrepreneurial resources.

Greater Phoenix is already distinguished as a hub of entrepreneurial energy. However, early stage software companies as well as growth companies need business expertise and funding to successfully build and scale companies. Hence, it is recommended to:

- Promote funding capacity across the entrepreneurial ecosystem to catalyze commercialization of early-stage innovation, including creating targeted funding mechanisms for software startup firms.
- Recruit and encourage the formation



FINDING QUALIFIED WORKERS TO HIRE IS THE MOST PRESSING ISSUE FOR SOFTWARE COMPANIES OF ALL SIZES OPERATING IN THE GREATER PHOENIX REGION.

and expansion of service providers that can assist start-up and small and medium-sized enterprises (SME) to validate their product, secure finances and grow.

3. Support a coordinated marketing effort to brand the region as a software and technology hub.

Software companies represent a potential for economic growth and regional prosperity. The region's growing capabilities to develop and commercialize digital and software technologies and successful startups should be part of the local, regional and state economic development marketing efforts.

- Promote local successes stories, showcasing companies that have achieved significant milestones – financing, IPO, new product breakthroughs – to increase local support and awareness of a regionally unifying brand.

4. Promote the development of innovation

districts to attract and retain software firms and talent.

Innovation Districts and other development projects that foster geographic concentrations of industries and firms and contain economic, physical, and networking assets, can enhance the region's ability to attract and retain growth companies and talent.

- Attract and retain innovation drivers – research and development institutions, large firms, SMEs, startups and entrepreneurs focused on developing cutting-edge technologies, products and services for the market.
- Attract and retain innovation cultivators – incubators, organizations, or groups that support the entrepreneurs, startups and inventors.
- Expand neighborhood-building amenities that provide important services to residents and workers in the district. 🏠

ACKNOWLEDGMENT

The Market Intelligence Program was developed and executed by the Greater Phoenix Economic Council (GPEC) in collaboration with GPEC's Economic Development Directors Team.

GPEC MEMBER COMMUNITIES:

Maricopa County	Gila Bend	Queen Creek
Apache Junction	Gilbert	Scottsdale
Avondale	Glendale	Surprise
Buckeye	Goodyear	Tempe
Casa Grande	Maricopa	Tolleson
Chandler	Mesa	Wickenburg
El Mirage	Peoria	Youngtown
Fountain Hills	Phoenix	

Photos by Shutterstock, Istock and Chris Loomis.

ENDNOTES

- 1 MarketLine Industry Profile Global Software & Services October 2014
- 2 EMSI 2014, NAICS 511210, 518210, 541511, 541512.
- 3 S&P Capital IQ. Computer: Software. August 2013
- 4 The Congressional Research Service indicated that occupations such as Software Developers, Systems Software and the alike will be in high demand. CRS. The U.S. Science and Engineering Workforce: Recent, Current, and Projected Employment, Wages, and Unemployment. May 6, 2013
- 5 HiringSolved. <http://jobs.aol.com/articles/2014/03/26/most-in-demand-jobs-now/>

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6	6	16	10	80	50
7	7	17	11	90	5A
8	8	18	12	100	64
9	9	19	13	110	6E
10	A	20	14	120	78

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