

A group of four people are seated around a wooden conference table in a modern office setting. One woman in the center is wearing a VR headset and smiling, gesturing with her hand. To her left, a man in a blue shirt and a woman in a white shirt are looking at her. To her right, another person is wearing a VR headset. A laptop is open on the table in front of the woman in the white shirt. The background shows a glass-walled office with blue lighting.

Future-Proofing the Video Game Industry in California

Rebecca Simon with Kevin Klowden
and Carolyn Karo Schulman



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In the U.S., competition in the video game industry is fierce. California still leads with 27 percent of the nation's gaming industry, but the gap between California and the next four states continues to narrow.



EXECUTIVE SUMMARY

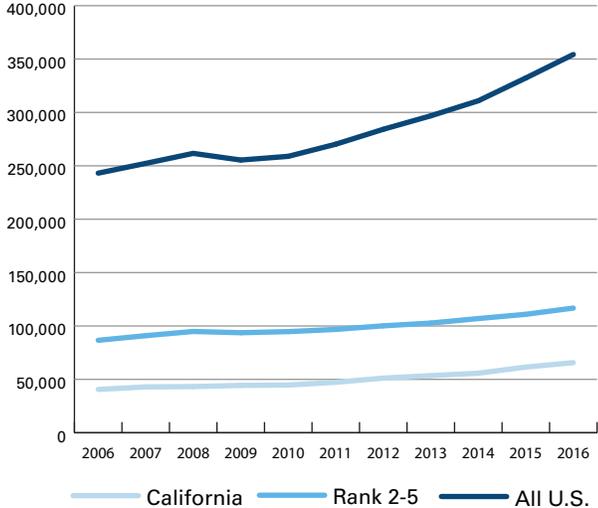
From arena esports with hundreds of thousands of online viewers to virtual reality health-care treatments, video games have come a long way since the arcade games of the 1970s. With an estimated global consumer revenue of approximately \$116 billion in 2017,¹ the industry continues to grow at a rapid pace. California leads the way in the United States with more than three times the number of companies (900+ firms) and seven times the workforce (33,000+ employees) as the second leading state, Texas, which has only 275 firms and 4,300+² employees. However, California faces increasing domestic and international competition, leading one to ask, how can California maintain its edge? This report explores several courses of action the state should consider to help protect current and future prospects of the state's video game industry, examining both the industry's business climate as well as ways to ensure that California is able to train, attract, and retain talented individuals.

California leads the way in the U.S. with more than three times the number of companies and seven times the workforce as the second leading state.

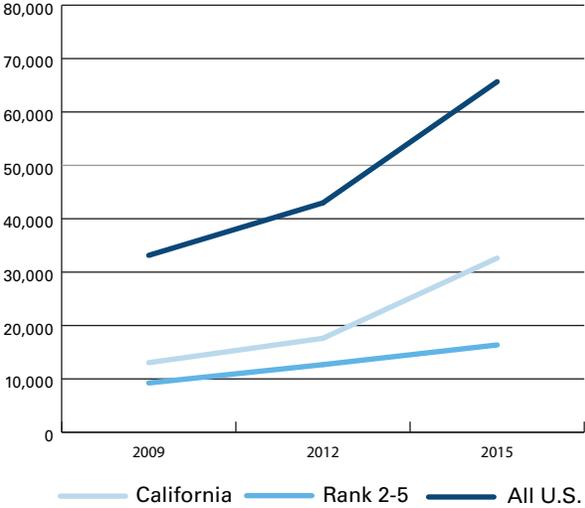
The software publishing industry contributed \$32 billion to California's gross domestic product in 2016.³ To determine how California does comparatively, we analyzed numerous public and private data sources and supplemented our research with stakeholder interviews to have a comprehensive understanding of how the state is performing. While the sheer number of video game establishments in California is noteworthy, employment numbers exemplify the impact to the state economy. In the figure on page four, we show the total workforce in software publishing as a whole and then in video game employment specifically (video games being a subset of software publishing).

California’s trendline for software publishing is similar to that of the other top states; however, we identify a notable distinction when focusing on just the video game industry. While the next four states combined (Texas, Washington, New York, and Massachusetts) have a higher number of individuals employed in software publishing, California has a much greater number employed in video games, a testament to the industry’s boon to the workforce.

Number of Individuals Employed in Software Industry by State (NAICS)



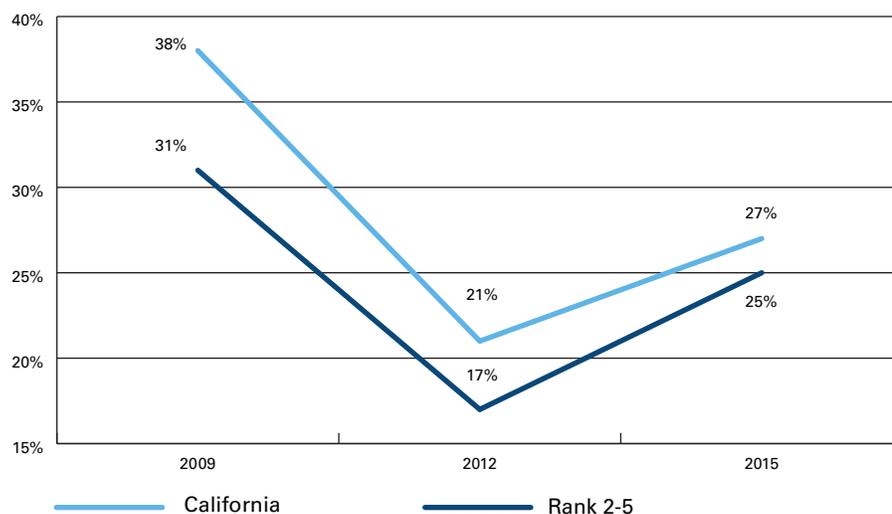
Number of Individuals Employed by Video Game Industry by State (ESA)



Note: States ranked 2-5 include: Texas (2), Washington (3), New York (4), and Massachusetts (5).
 Source: Bureau of Labor Statistics, Quarterly Census of Employment & Wages, U.S. Total, California, Texas, Washington, New York, Massachusetts, 2006-2016; Stephen E. Siwek, *Video Games in the 21st Century: The 2017 Report* (Entertainment Software Association, 2017); Stephen E. Siwek, *Video Games in the 21st Century: The 2014 Report* (Entertainment Software Association, 2014).

In the U.S., competition in the video game industry is fierce. Now, all 50 states have a share of the industry, and several of the up-and-coming states have increasingly large footprints. California still leads with 27 percent of the nation’s industry, but, as seen below, the gap between California and the next four states continues to narrow.

Change in Share of Video Game Establishments by State (2009-2015)



Note: States ranked 2-5 include: Texas (2), Washington (3), New York (4), and Massachusetts (5).
Source: Stephen E. Siwek, *Video Games in the 21st Century: The 2017 Report* (Entertainment Software Association, 2017); Stephen E. Siwek, *Video Games in the 21st Century: The 2014 Report* (Entertainment Software Association, 2014).

Policies and Best Practices

In an effort to determine whether California needs to adopt policies and best practices to ensure its continued importance to the video game industry, we looked at what other jurisdictions are doing and how such policies and practices might affect the industry in California. Through extensive qualitative research and case studies, we found many jurisdictions with business-friendly policies that encourage video game development.

Tax Incentives: We considered various forms of tax incentives that could benefit the video game industry in California. Twenty-one U.S. states and two Canadian provinces offer production tax credits, grants, or rebates that cover all aspects of creating a video game—the most prominent programs are in Texas, Georgia, and the Canadian province of Quebec. Numerous stakeholders noted the existence of other tax benefits—including state-level research and development (R&D) credits and sales and use exemptions—as factors that collectively positively impact the business climate of a given state.



Small Businesses: Small businesses are an essential component of the video game industry. A 2016 analysis determined that over 90 percent of video game companies employ 30 or fewer employees.⁴ Policies tailored to small establishments and startups would naturally benefit the interactive entertainment industry. These can come in the form of altering state tax incentives, such as making the R&D tax credit transferable or refundable, or, more likely, through local efforts, such as the creation of incubators and accelerators.

Training: Education and workforce development are vital to maintaining an abundant talent pipeline. In the video game industry, employers depend on sufficient technical training in computer programming and other technologies (an area in which the U.S. is often lacking when compared to foreign peers). In California, reforms in K-12 curriculum to encourage interest in science, technology, engineering, and mathematics (STEM) fields, including video game careers, would shore up the pipeline of in-state students qualified to enter the video game industry workforce upon graduation.⁵ Additionally, the video game industry, more than most fields, relies on strong connections between higher education and firms. An influx of video game education programs has supported this effort, but, to have an effective ecosystem, California needs a robust educational infrastructure and new and growing companies to collaborate with that system.

RECOMMENDATIONS

California continues to thrive in the video game industry, but the state faces substantial competition, both domestic and foreign. Based on these findings, we identified four interventions that California should consider to future-proof the state's video game industry:

1

Adapt California's existing sales and use tax exemptions to apply to video games, facilitating firm expansion;

2

Expand or revise the state R&D tax credit to better serve startups and small businesses;

3

Explore developing a production-based tax credit for video games if California's share of the video game industry declines; and

4

Improve the development of in-state computer programmers and developers by strengthening relationships between the video game industry and two- and four-year colleges.

INTRODUCTION

Perhaps no other industry reflects the convergence of technology and entertainment as well as the video game industry, which passed the \$100 billion mark for global revenue in 2016. Driving this growth are mobile video games, made possible by the ubiquity of smartphones, technology breakthroughs in virtual/augmented/mixed reality (VR/AR/MR), access to self-publishing platforms, and the overwhelming popularity of esports. The industry is expanding beyond entertainment; video games are now developed for social impact, education, and medical care. Video games have become so lucrative that colleges and universities now offer certificates and degrees—and even award scholarships—in video game design, development, and production. Asia alone—led by companies like Tencent Holdings Limited (China), NetEase, Inc. (China), Bandai Namco Entertainment Inc. (Japan), and Nexon Co., Ltd. (South Korea)—generates \$51.2 billion in global revenue from the video games industry. On a per country basis, China leads with an estimated \$32.5 billion, followed closely by the United States with \$25.4 billion in video game-generated revenue. Between 2009 and 2016, revenue from the video game industry in the U.S. more than doubled (from \$10.1 billion to \$24.5 billion).

The video game industry passed the \$100 billion mark for global revenue in 2016. Between 2009 and 2016, revenue from the video game industry in the U.S. more than doubled.

Leading the industry in the United States, with its proximity and access to centers of entertainment, technology, and innovation, is the state of California, with more than 900 firms and 33,000+ employees.⁶ As the industry grows, cities, states, and countries are offering economic incentives (such as tax credits, rebates, or grants) and creating, attracting, and retaining strong talent pipelines that compete with California. The goal of this study is to assess and recommend potential public policies and best practices that could strengthen California's competitive position in the industry, thus future-proofing the industry and retaining and creating more jobs within the state.



First, we provide a brief industry overview to gain a better grasp of the video game ecosystem, key trends driving growth, and a geographic overview within the U.S. and California, specifically including emerging cities and regions. We then analyze publicly available data, as well as proprietary data obtained from the Entertainment Software Association (ESA), to evaluate the video game industry's current economic contribution to California specific to economic output, employment, and wages. This section also includes a time series analysis using North American Industry Classification System (NAICS) data from 2006 to 2016 to determine the industry's growth in California, and California's pace of growth compared to other states.

We continue by identifying public policies and best practices that could incentivize and promote further industry development in locations where the industry is healthy and growing. We then return our focus to California to explore how the state could implement such strategies. Finally, we end by making recommendations based on the public policies and best practices that have the highest likelihood of maintaining and even improving California's competitive position in the industry.

We supplemented our research and quantitative data analysis with extensive input from industry professionals and experts—CEOs, government affairs and human resources specialists, lawyers, educators—as well as local elected officials, to better understand the wants and needs of video game companies and the political and policy environments in which they operate.

INDUSTRY OVERVIEW

Ecosystem

The video game industry is comprised of developers, publishers, non-exclusive developers, hardware and software manufacturers, service providers, and distributors.⁷

Developer: any company whose primary business is the creation of one or more video games. While developer activities can include programming, design, and writing, they do not necessarily have to do all aspects of development to belong in this category, as long as the developer companies produce the final product.

Publisher: any company whose primary business activity is the publication of developers' content. Publishers frequently develop their own content as well as publish external and subsidiary developers' content to various platforms, including console, online, mobile, and computer.

Non-Exclusive Developer: any company who develops video games in conjunction with other business activities. Non-exclusive developers often develop games for mobile and web-based platforms and do so while also performing activities such as web design or animation.

Hardware/Software Manufacturers: any company who constructs physical equipment or accessories for video games and other uses. Manufacturers can include the production of game consoles, headsets, controllers, computer chips, virtual reality equipment, etc.

Service Provider: any company or individual who participates in the development of a game but does not produce or publish final products. Service providers are typically contractors who take part in some aspect of game development, such as programming or design.

Distributor: any company whose primary business activity is distributing content through online platforms or the physical distribution of published content. Distributors do not include individual retail stores that sell video games, such as GameStop, Best Buy, Target, or Walmart. They do include digital distributors, such as Valve's Steam, Google Play, and PlayStation Store.

From Donkey Kong and Pong to games on smartphones, the video game industry has matured to an estimated \$116 billion market in 2017.⁸ As noted prior, Asian companies, such as Tencent, NetEase, Bandai, and Nexon, generated over an estimated \$51 billion in global revenue in 2017.⁹ While China has the highest estimated revenue by country of \$32.5 billion, the United States is close behind with \$25.4 billion in 2017.¹⁰ Current industry trends like mobile games, VR/AR/MR, and self-publishing are lowering barriers to entry and transforming the consumer experience. Combined with the popularity of esports and the application of game design for non-entertainment purposes, the industry's presence has even extended to colleges and universities, where scholarships, certificates, and degrees are awarded in video game design, development, and production.

Trends

Mobile Video Games

According to a 2017 Newzoo “Global Games Market” report, mobile video games—accessed 80 percent on smartphones and 20 percent on tablets—are expected to represent over half of the total video game market by 2020, when it is projected to reach \$72.3 billion in revenue.¹¹ Already, video games account for 80 percent of the gross revenue generated by Apple’s App Store and greater than 90 percent by Google Play.¹² As with all video gaming, China leads the global mobile market—Tencent and NetEase alone generate \$7.7 billion in mobile revenue.

In the U.S., mobile video game users play an average of 1.3 games per day.¹³ They download arcade and action games the most, though strategy games capture the highest revenue.¹⁴ The penetration rate of mobile games in the U.S. (i.e., the share of active users) is projected to rise from 51.3 percent in 2015 to 63.7 percent in 2020.¹⁵





The rise in popularity of mobile video games presents value capture opportunity in all aspects of the latest trends. For smaller, independent video game developers, mobile games offer industry access by publishing content for purchase on digital storefronts. Established corporations are taking note and bringing key intellectual property (IP) to mobile platforms. For example, the 2016 phenomenon Pokémon GO, an augmented reality game, uses Nintendo IP, developed by the California-based company Niantic, an internal startup within Google.¹⁶ Even esports, while traditionally having PC-heavy viewership, are expanding to mobile. Game developer Super Evil Megacorp, which created Vainglory, one of the first touch-screen esports games designed specifically for mobile devices, recognized that for younger generations “smartphones are an extension of themselves.”¹⁷

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Self-Publishing

Historically, the video game industry was dominated by only a select few publishers, such as Sony Interactive Entertainment, Nintendo, Microsoft Game Studios, and, more recently, Tencent. However, access to self-publishing platforms like Valve’s Steam, Facebook, and other web-based distributors has led to a surge in developer opportunities for those not connected to formal publishers. Steam was developed in 2002 by Valve Corp. as a fix for challenges in updating their online games. In the years that followed, it became a prominent venue for other developers to distribute online games. This platform alone saw a 1,498 percent increase in the number of games distributed through their platform—from 283 games in 2010 to 4,240 in 2015. Over 89 percent of industry growth from 2013 to 2015 in the top 10 states by growth (Arizona, Colorado, Florida, Georgia, Indiana, Louisiana, Maryland, Pennsylvania, Utah, and Wisconsin) was in the development sector.¹⁸ As stated above, mobile games and access to application stores through smartphones are a critical part of this trend, enabling individuals or companies to develop games and sell them on mobile devices. Recognizing the competition, traditional publishers are taking note. As of March 2017, Microsoft’s ID@Xbox program allows qualified game developers of all sizes to self-publish digital games on Xbox One and Windows 10.¹⁹

Virtual/Augmented/Mixed Reality

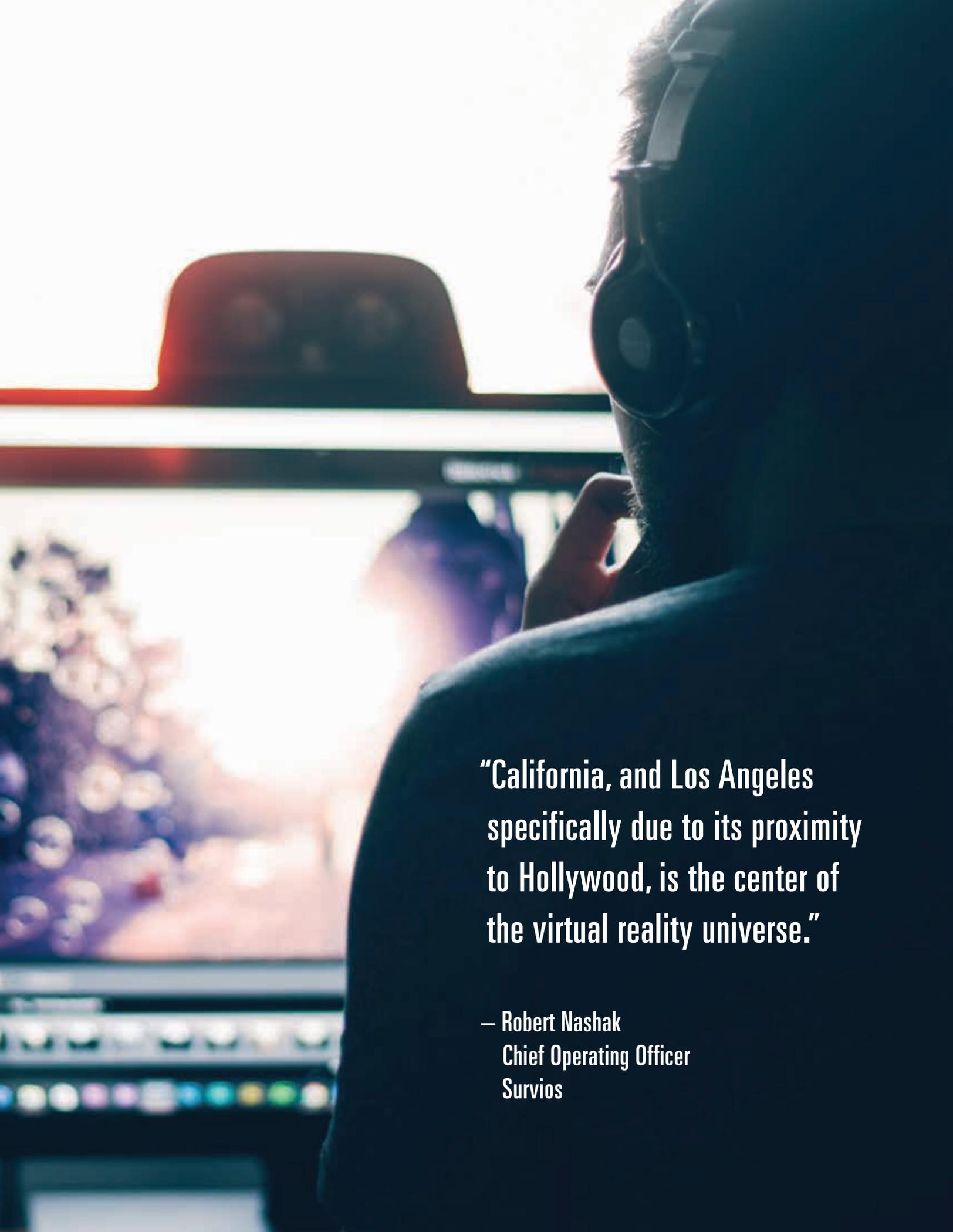
Virtual, augmented, and mixed reality (VR/AR/MR) are technologies that are rapidly becoming commonplace in video gaming, with some of the largest proponents of, and markets for, the technology being gamers themselves. Virtual reality is the artificial recreation of a world with which users can interact, whereas augmented reality superimposes an image on a user's view of the real world. Mixed reality is a hybrid technology that takes place in both the physical and virtual worlds. Virtual reality companies have been slower to achieve wide market acceptance than anticipated, but augmented and mixed reality through the likes of Pokémon GO, Microsoft HoloLens, and Magic Leap are showing clear signs of success. Pokémon GO's revenue for just their first three months was \$600 million.²⁰ From 2015 to 2016, companies developing both VR/AR technologies increased by 88.2 percent.²¹ In California, the big tech companies like Facebook (with Oculus), Alphabet (the Google parent company with Daydream View), and Sony Interactive Entertainment (with PlayStation VR) and small startups alike are attempting to make a name for themselves in this sphere.

Virtual reality is the artificial recreation of a world with which users can interact. Augmented reality superimposes an image on a user's view of the real world. Mixed reality is a hybrid technology that takes place in both the physical and virtual worlds.

Worldwide revenues for the VR/AR market are projected to approach \$14 billion in 2017 and then rocket to \$143 billion by 2020.²² Artificial intelligence (AI) and VR/AR are proving a lucrative means for smaller startups to differentiate themselves in the world of interactive entertainment. There are 144 game developers in the United States creating original content for augmented or virtual reality enabled technologies, such as mobile applications and PC gaming platforms like Steam. And funders are taking note. In January 2017, Samsung NEXT, the technology firm's investment arm, created a \$150 million fund for startups focusing on new technology like VR/AR, AI, and other internet-connected devices.²³

“California, and Los Angeles specifically due to its proximity to Hollywood, is the center of the virtual reality universe. Yet a good portion of VR companies are startups, and the high cost of living for employees and renting office and production space have a significant impact. Doing something to offset that would go a long way to improve the viability of small businesses in VR.”

—Robert Nashak, Chief Operating Officer, Survios

A person is shown from the back, wearing large VR goggles. They are in a control room or studio, with a large monitor in front of them displaying a blurred image of a city at night. The person's hand is near their face, possibly adjusting the goggles. The lighting is dim, with the primary light source being the monitor and some ambient room lights.

“California, and Los Angeles specifically due to its proximity to Hollywood, is the center of the virtual reality universe.”

**— Robert Nashak
Chief Operating Officer
Survios**

Esports

Esports is generally defined as competitive video gaming at a professional level in leagues or tournament-like settings with significant prize money. It has emerged as a leading component of the interactive entertainment industry and has gained adopters (and investors) in mainstream sports culture. Revenue estimates for esports in 2017 are near \$660 million and are expected to surpass \$1 billion by 2019.²⁴ Tencent-owned Riot Games' League of Legends and Valve's Dota 2 and Counter-Strike currently lead the market, but other key players include Activision Blizzard's Call of Duty and Overwatch and Electronic Arts' FIFA, both California-headquartered companies.²⁵ A core component of Valve's success is that the company is an online platform that can draw content from many different developers. Valve's Steam self-publishing platform allows outside developers to publish games on the site, enabling Valve to capitalize on games not developed by the company while also pushing its own very successful games.²⁶

To highlight the magnitude of the industry, numerous investors are banking on the future of video games by pouring money into esports. Even traditional sports backers, such as the owners of the New York Yankees, have invested millions in esports companies.²⁷ The last several years have seen record esports viewership. The Intel Extreme Masters (IEM) World Championship in Poland drew 173,000 fans to the stadium and 46 million online viewers. The previous year, 43 million viewers watched the League of Legends Championship.²⁸ Colleges and universities now offer significant esports scholarships with 17 colleges offering varsity athletic scholarships for esports.²⁹

Revenue estimates for esports in 2017 are near \$660 million and are expected to surpass \$1 billion by 2019.

Beyond Entertainment

Since the industry's inception, educators, scientists, and health-care providers began thinking about the potential applications to their respective fields.³⁰ "Serious games" apply game design elements and game principles in non-entertainment contexts to boost engagement and successful end results. One example is at the University of Southern California's Institute for Creative Technologies where they design and explore programs utilizing virtual and augmented reality to assist veterans in countering the effects of post-traumatic stress.³¹ Another example is Multivarious Games, a company in Columbus, OH, that has partnered with Nationwide Children's Hospital to design a program for Xbox Kinect to measure and track movement in Muscular Dystrophy patients.³² Today the market for video games for social impact, education, and medical applications is booming and often lucrative. The biopharmaceutical industry is even picking up on it for the treatment of ailments such as attention deficit hyperactivity disorder (ADHD), Alzheimer's, and autism. Companies like Merck, Shire, Pfizer, and California-based Amgen invested in a 2011 mobile video game startup, Akili Interactive Labs, which has already raised \$72.9 million in equity investment for clinical trials.³³





“Serious games” apply game design elements and game principles in non-entertainment contexts.

One organization, Games for Change, highlights the power of video games to “drive real world change.”³⁴ Through educational programs, it encourages game creators and social innovators to design socially-conscious games and young people to pursue STEM education. New emphasis has also been placed on STEAM education, as opposed to just STEM, incorporating arts to the existing science, technology, engineering, and mathematics.³⁵

Game Education

On the topic of education, game education refers to any course that teaches skills specifically related to the creation of video game products, including computer science, information technology, information systems design, digital media, art and animation, business, English, and music.³⁶ More than 480 U.S. colleges and universities now offer video game degrees, with over 1,000 institutions offering video game studies curriculum, and that number is rapidly growing. From 2015 to 2017, the number of programs offered grew from 406 to 484, representing a nearly 20 percent increase in just two years.³⁷

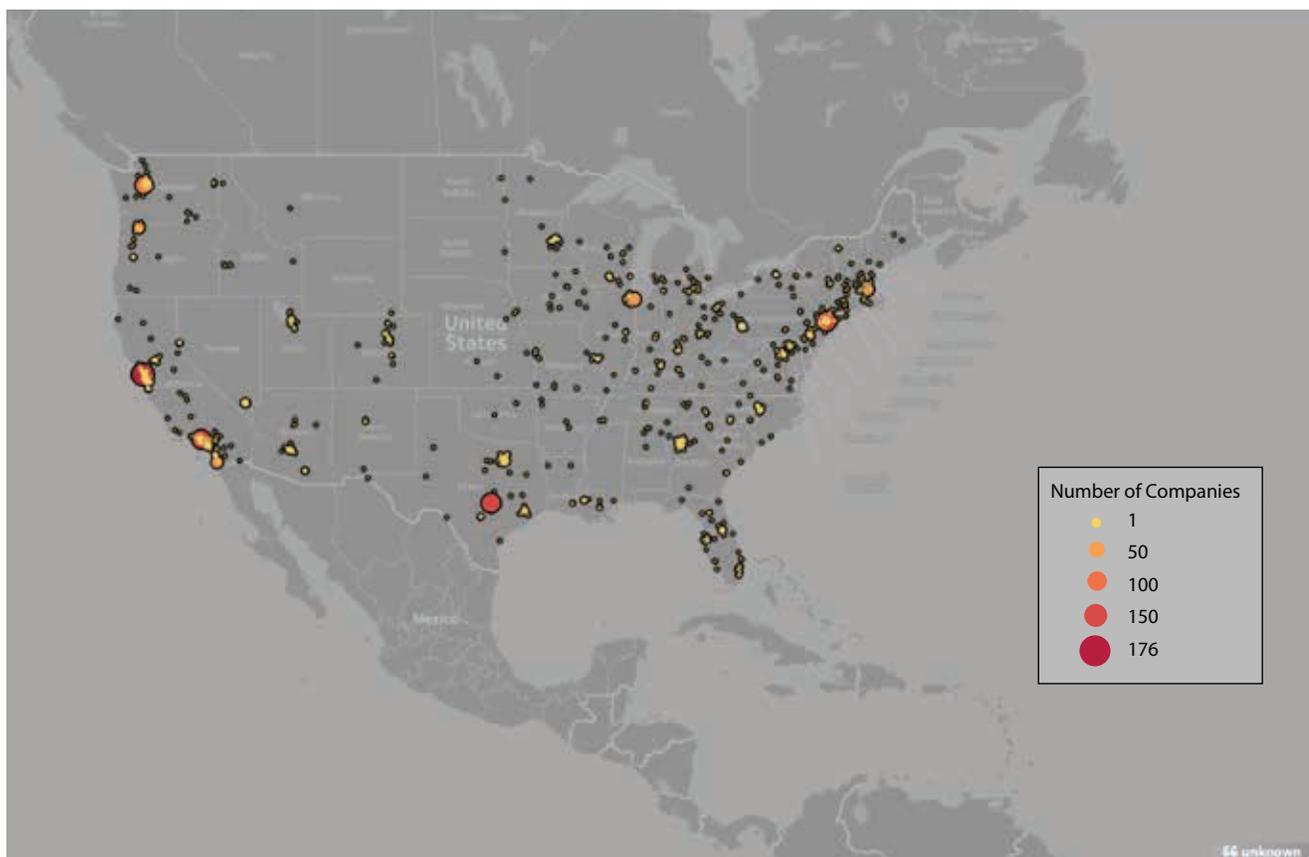
USC is the top school for game design programs in the U.S. Two other California institutions are in the top 25.

According to The Princeton Review, the University of Southern California in Los Angeles is the top school for game design in the U.S. and two other California institutions are in the top 25—the University of California, Santa Cruz and Cogswell College in San Jose.³⁸ Some lower-cost state schools and community colleges are adding programs as well. While not limited to video games, in fall 2016, Santa Monica College implemented a new bachelor’s degree program in interaction design (part of the California Community College bachelor’s degree pilot program), a four-year degree at just over \$10,000.³⁹ According to a 2015 survey by the Higher Education Video Game Alliance, 91.3 percent of game-based program alumni report gainful employment after one year on the market, with 55.8 percent within the video game industry.⁴⁰ The Entertainment Software Association has also analyzed the higher education landscape and found a strong correlation between the number of video gaming studies programs and the number of video game firms in a state.⁴¹

VIDEO GAMES IN THE UNITED STATES

There are approximately 3,090 video game company locations⁴² in the United States—with California being home to over 30 percent (933).⁴³ Other hubs across the U.S. include Austin, Dallas, and Houston in Texas, as well as New York City, Seattle, Chicago, and Boston.

Figure 1: U.S. Video Game Industry Hotspots by Metropolitan Statistical Area (MSA)

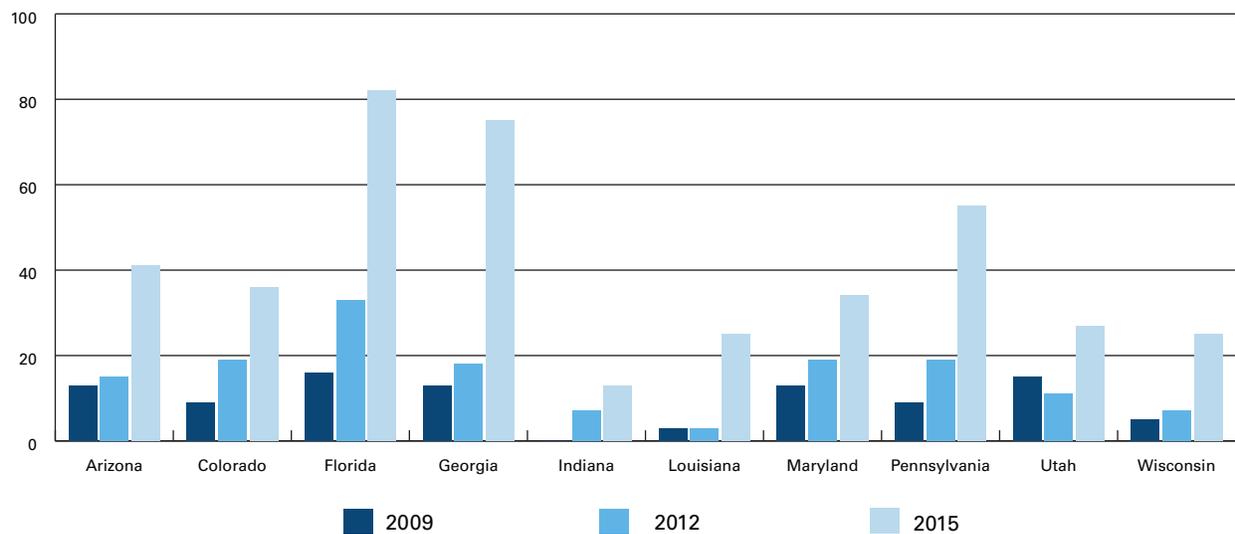


Source: Entertainment Software Association; Higher Education Video Game Alliance, "Impact of Video Game Industry: State by State," accessed December 15, 2017, www.areweinyourstate.org; Milken Institute.

Asia still dominates the video game industry with respect to global revenue and the number of active users, but the United States' importance to the industry is undeniable. We see an East-West connection more than ever before—even greater than when Nintendo first arrived on U.S. shores with the Nintendo Entertainment System (NES) and Gameboy in the 1980s.⁴⁴ Sony moved its Interactive Entertainment (SIE) headquarters, which is responsible for the PlayStation brand, to San Mateo, CA in 2016, citing the shrinking market in Japan and stating that “proximity to the U.S. market is crucial for Sony to stay ahead of the competition because, in addition to its size, the latest trends usually originate there first.”⁴⁵ In 2011, Tencent acquired Riot Games, the Los Angeles, CA-based publisher of League of Legends, which over 100 million users play every month, in another move that reflects the strong standing of California video game development.⁴⁶

While California is the state best known for the video game industry, all 50 states have a slice of it now, and many states are rapidly growing in number of companies. The current top states for growth are Indiana, Utah, Maryland, Florida, Louisiana, Wisconsin, Arizona, Pennsylvania, Georgia, and Colorado, with most hot spots in their respective major cities (e.g., Indianapolis in Indiana, Salt Lake City in Utah, Denver in Colorado).

Figure 2: Up-and-Coming Video Game Establishments

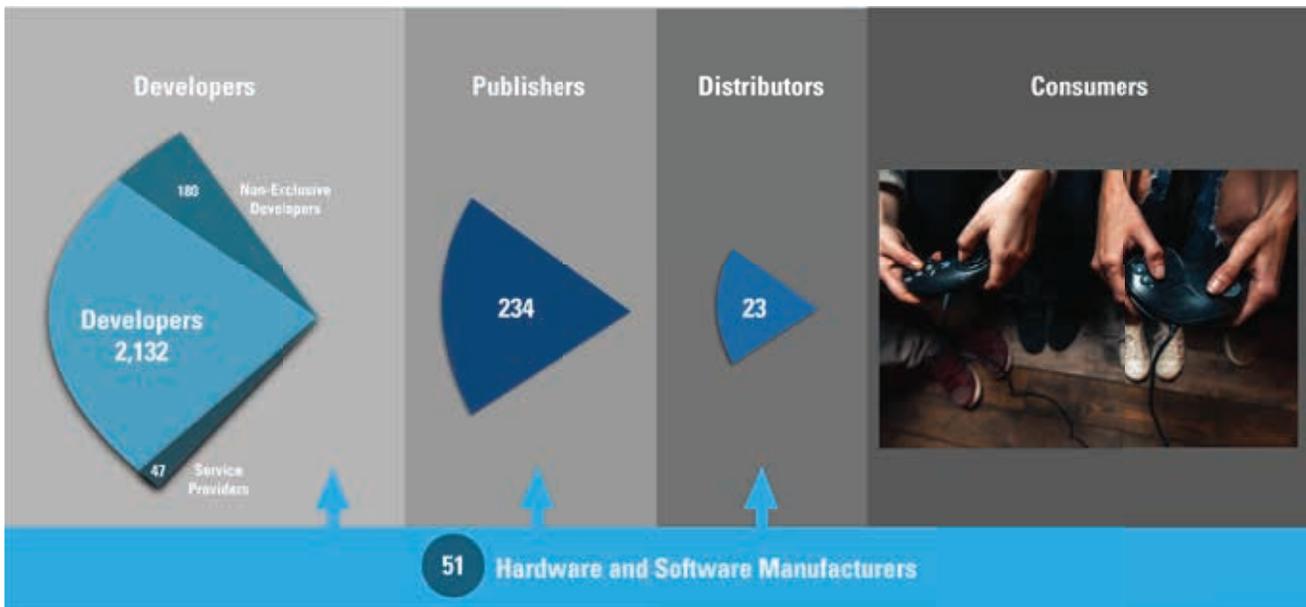


Source: Stephen E. Siwek, *Video Games in the 21st Century: The 2017 Report* (Entertainment Software Association, 2017). Stephen E. Siwek, *Video Games in the 21st Century: The 2014 Report* (Entertainment Software Association, 2014).

The video game industry is highly entrepreneurial in the United States. Almost 100 percent (99.7 percent) of companies qualify as small businesses, and over 90 percent have 30 or fewer employees. Developers make up 80 percent of all companies, and 98 percent of new businesses are developers.⁴⁷ These new entrants are vital to the video gaming ecosystem, representing a quickly growing segment of the information technology sector.

Almost 100 percent of video game companies qualify as small businesses. Over 90 percent have 30 or fewer employees.

Figure 3: U.S. Video Game Industry by Size



Source: Entertainment Software Association; Higher Education Video Game Alliance, "Impact of Video Game Industry: State by State," December 1, 2017.

VIDEO GAMES IN CALIFORNIA

The majority of California’s 900+ companies are located in greater Los Angeles and the Bay Area, where they are close to and able to leverage Silicon Beach and Silicon Valley—centers of entertainment, technology, and innovation. This includes the Los Angeles-Long Beach-Santa Ana, San Francisco-Oakland-Hayward, and San Jose-Sunnyvale-Santa Clara Metropolitan Statistical Areas (MSAs) with 331, 307, and 75 companies, respectively. The Los Angeles area is home to prominent companies—Activision Blizzard in Santa Monica, Riot Games in West Los Angeles, and the U.S. video game offices of Konami Digital Entertainment in El Segundo. Meanwhile, companies like Electronic Arts in Redwood City, Sony Interactive Entertainment America (EA) in San Mateo, a division of Ubisoft in San Francisco, Atari in Sunnyvale, and a division of Tencent in Palo Alto can all be found in the greater Bay Area. Other areas of industry activity include Orange County (including Activision’s Blizzard division in Irvine) and Sacramento (including EA’s Capital Games). Notably, the concentration in Los Angeles and San Francisco, over the traditional tech hub of San Jose, highlights the key role of entertainment and culture in the video game industry, beyond simply technology. Another top MSA for the industry is San Diego-Carlsbad-San Marcos with 71 companies and which hosts Comic-Con, the annual multi-genre entertainment and comic convention where video game companies have a large presence.





Software Industry Clusters Across California

Industry location quotients (LQs) are ratios that compare an industry's share of regional employment with its share of national employment. They are useful in determining which industries make the regional economy unique compared to the rest of country. The software industry LQs from the Bureau of Labor Statistics show that software businesses play a substantial role in many MSAs across California. The MSAs with the highest industry LQs in California are 1) San Jose-Sunnyvale-Santa Clara, 2) Santa Maria-Santa Barbara, and 3) San Francisco-Oakland-Hayward.

Table 1: Location Quotients for Top Software Industry Metropolitan Statistical Areas (MSAs) in California

Metropolitan Statistical Area (MSA)	Annual Average Employment Location Quotient 2013	Annual Average Employment Location Quotient 2014	Annual Average Employment Location Quotient 2015	Annual Average Employment Location Quotient 2016	Annual Average Employment 2016
Los Angeles-Long Beach-Anaheim, CA MSA	0.90	0.88	0.96	1.01	14,821
Sacramento-Roseville-Arden-Arcade, CA MSA	0.44	0.39	0.41	0.44	1,046
San Diego-Carlsbad, CA MSA	1.42	1.36	1.28	1.13	3,974
San Francisco-Oakland-Hayward, CA MSA	3.82	3.79	3.85	3.73	21,624
San Jose-Sunnyvale-Santa Clara, CA MSA	7.14	7.02	6.94	6.96	18,488
San Luis Obispo-Paso Robles-Arroyo Grande, CA MSA	1.53	1.6	1.58	1.22	349
Santa Maria-Santa Barbara, CA MSA	3.66	3.87	3.82	3.92	1,908

Source: Bureau of Labor Statistics, Quarterly Census of Employment and Wages, Private NAICS 511210 Software Publishers, Annual Average 2013, 2016.

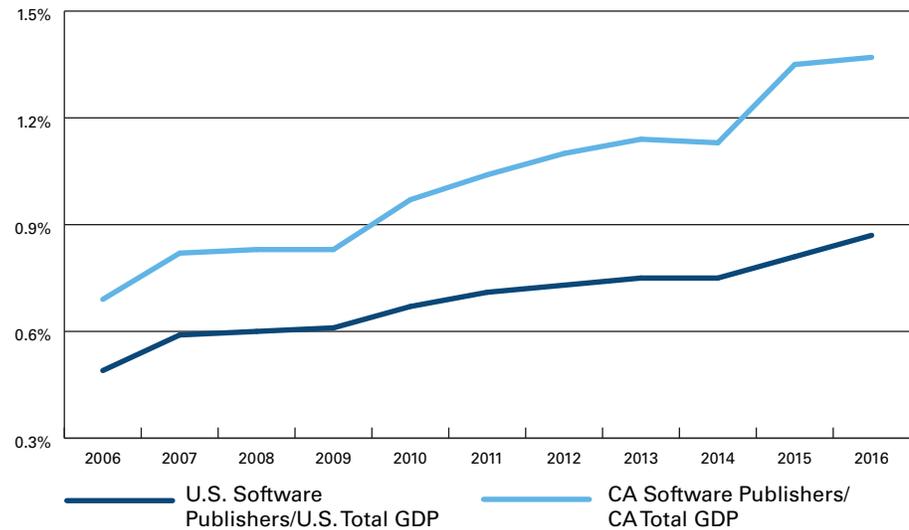
Economic Impact

We examined North American Industry Classification System (NAICS) and ESA proprietary data to evaluate the industry's economic contribution to California concerning output, employment, wages, and GDP impact, as well as the pace of growth in California and compared to other states. The NAICS data drills down to the software publishers classification (NAICS code 511210), a broad category of establishments that carry out operations necessary for producing and distributing computer software, such as designing, providing documentation, assisting in installation, and providing support services to software purchasers. The ESA is the U.S. association exclusively dedicated to serving the business and public affairs needs of companies that publish computer and video games for video game consoles, handheld devices, personal computers, and the internet. Every year the ESA conducts research and gathers data on its member companies and users, and since 2010 has been producing economic impact reports as well. Combined, the data offers a good representation of the video game industry growth.

GDP Growth

Overall, the real gross domestic product (GDP) growth in the software industry for both the United States and California specifically has more than doubled between 2006 and 2016. GDP in the United States increased from \$72 billion to \$145 billion, while California grew from \$14 billion to \$32 billion.

Figure 5: U.S. and California Software Industry Share of Real GDP



Source: U.S. Bureau of Economic Analysis (BEA); Moody's Analytics Estimates, 2007-2016, accessed January 5, 2018.

GDP growth in the software industry for both the U.S. and California specifically has more than doubled between 2006 and 2016. GDP in the U.S. increased from \$72 billion to \$145 billion, while GDP in California grew from \$14 billion to \$32 billion.

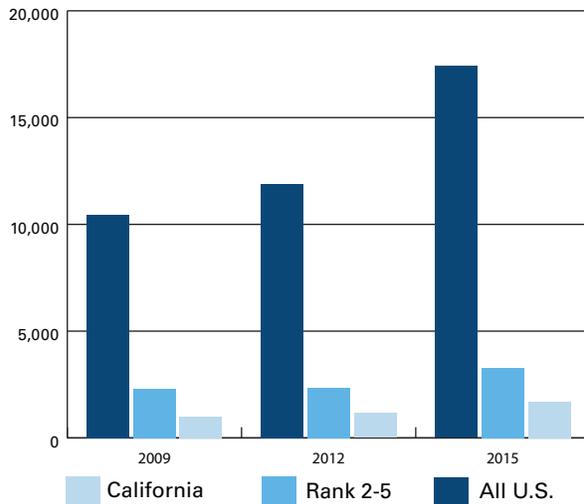
Establishment Trends

The amount of U.S. software industry establishments more than doubled between 2009 and 2015; however, California's growth made up a progressively smaller portion of the overall growth. A similar trend was observed with respect to U.S. video game industry locations; nationally, the number of locations jumped to 2,858 in 2015 from only 708 in 2009—an increase of 304 percent—while California's pace, although still high, grew more slowly at 184 percent.

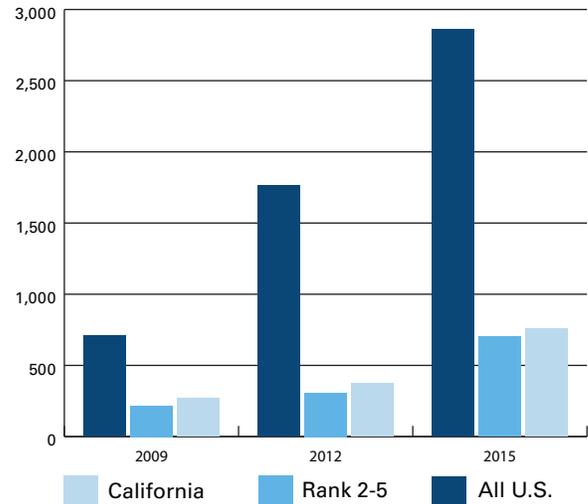


Figure 6: Comparison of Software Industry and Video Game Industry Establishments

Number of Software Industry Establishments between 2009-2015 (NAICS)



Number of Video Game Establishments between 2009-2015 (ESA)

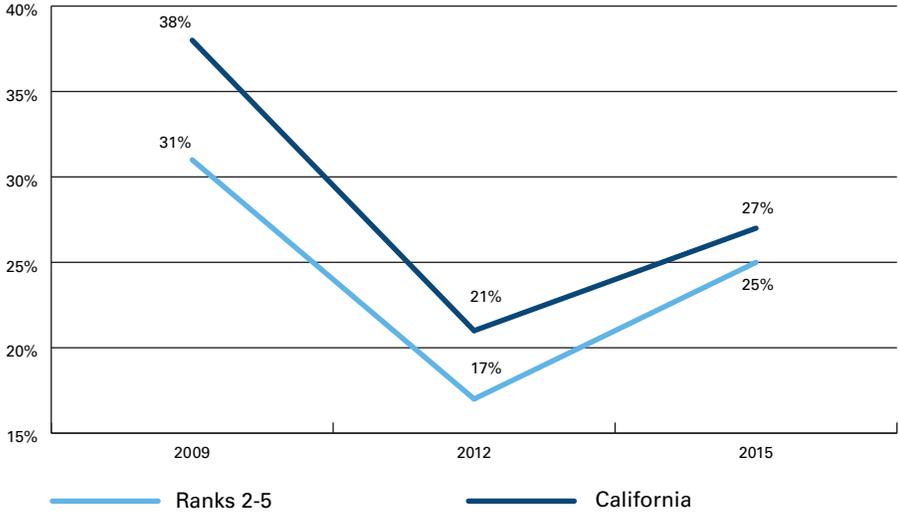


Note: States ranked 2-5 include: Texas (2), Washington (3), New York (4), and Massachusetts (5).
 Source: Bureau of Labor Statistics, Quarterly Census of Employment & Wages, U.S. Total, California, Texas, Washington, New York, Massachusetts, 2006-2016; Stephen E. Siwek, *Video Games in the 21st Century: The 2017 Report* (Entertainment Software Association, 2017); Stephen E. Siwek, *Video Games in the 21st Century: The 2014 Report* (Entertainment Software Association, 2014).

While the industry remains strong and growing, California’s share of video gaming companies is volatile—falling sharply from nearly 38 percent to 21 percent between 2009 and 2012 and then rebounding to 27 percent in 2015. No other state has a higher percentage of U.S. video game development establishments, but other top states (Texas, Washington, New York, and Massachusetts) combined have increased their share of video game establishments at a faster rate than California between 2012 and 2015.

California’s share of video gaming companies is volatile—falling sharply from nearly 38 percent to 21 percent between 2009 and 2012 and then rebounding to 27 percent in 2015. But California still has the highest percentage of video game development establishments of any state in the U.S.

Figure 7: Changes in Share of Video Game Establishments by State (2009-2015)

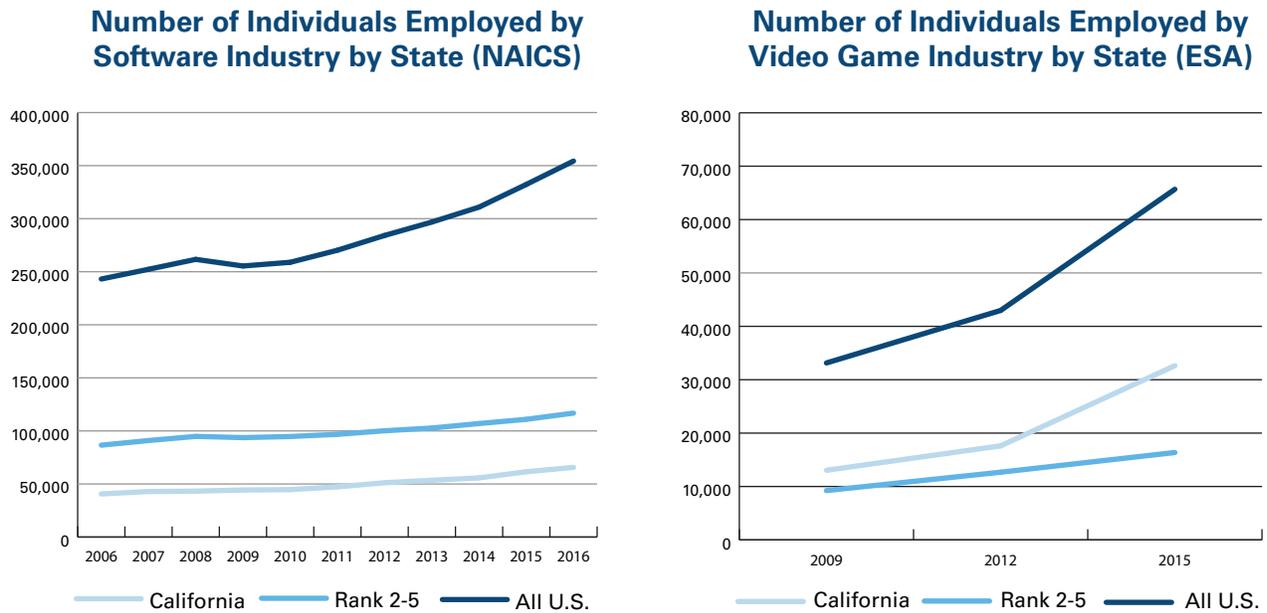


Note: States ranked 2-5 include: Texas (2), Washington (3), New York (4), and Massachusetts (5).
Source: Stephen E. Siwek, *Video Games in the 21st Century: The 2017 Report* (Entertainment Software Association, 2017); Stephen E. Siwek, *Video Games in the 21st Century: The 2014 Report* (Entertainment Software Association, 2014).

Employment Trends

California remains the state with the highest number of employees for both the video game industry and the software industry as a whole. It experienced an 85 percent increase in the number of video game industry jobs—a rise from 17,608 to 32,632 between 2012 and 2015 (see Figure 8). Notably, the video game industry occupies a much larger segment of the software publishing industry overall in California than in Texas, Washington, New York, and Massachusetts, combined.

Figure 8: Comparison of Software Industry and Video Game Industry Employment



Note: States ranked 2-5 include: Texas (2), Washington (3), New York (4), and Massachusetts (5).
 Source: Bureau of Labor Statistics, Quarterly Census of Employment & Wages, U.S. Total, California, Texas, Washington, New York, Massachusetts, 2006-2016; Stephen E. Siwek, *Video Games in the 21st Century: The 2017 Report* (Entertainment Software Association, 2017); Stephen E. Siwek, *Video Games in the 21st Century: The 2014 Report* (Entertainment Software Association, 2014).

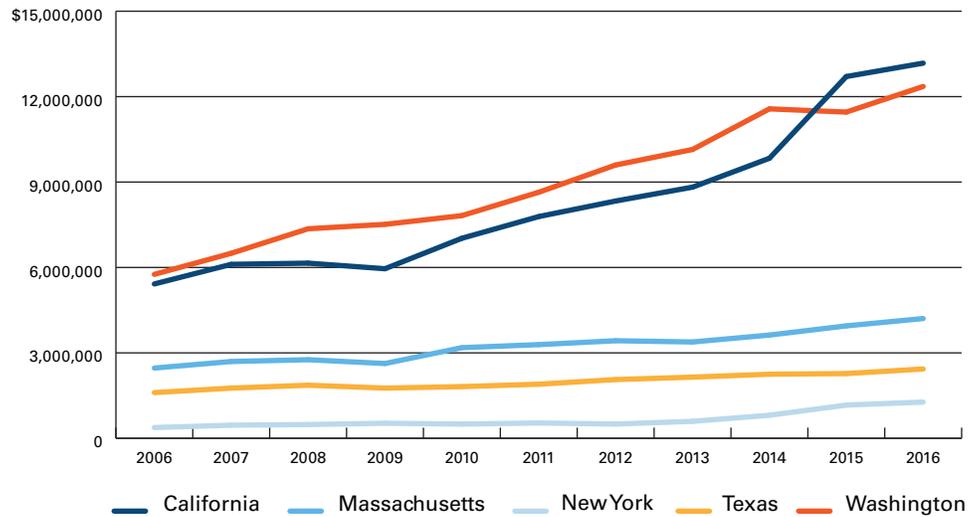
California remains the state with the highest number of employees for both the video game industry and the software industry as a whole. The video game industry occupies a much larger segment of the software publishing industry overall in California than in Texas, Washington, New York, and Massachusetts, combined.

Total Annual Wages for the Software Industry

California and Washington had similar trends in total annual wages for the software industry between 2006 and 2016. Washington had the highest total wages until 2015 when California took the lead. In 2016, companies in California provided employees total annual wages of approximately \$13.2 billion.



Figure 9: Total Annual Wages in Software Industry by State (NAICS)



Source: Bureau of Labor Statistics, Quarterly Census of Employment & Wages, U.S. Total, California, Texas, Washington, New York, Massachusetts, 2006-2016; Stephen E. Siwek, *Video Games in the 21st Century: The 2017 Report* (Entertainment Software Association, 2017); Stephen E. Siwek, *Video Games in the 21st Century: The 2014 Report* (Entertainment Software Association, 2014).

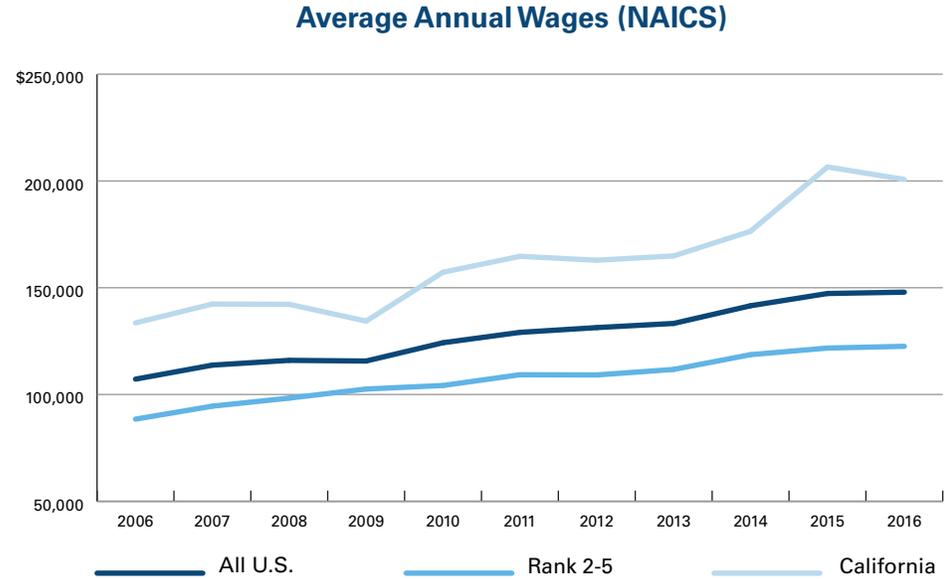
In 2016, companies in California provided employees with total annual wages of approximately \$13.2 billion.

Average Annual Wages for the Software Industry

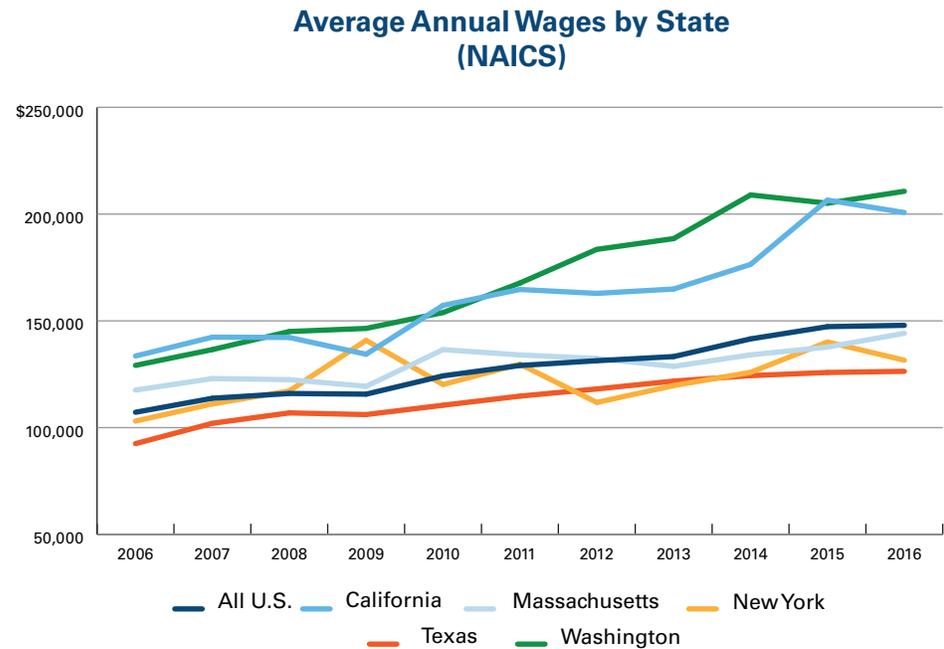
California and Washington have similar trends in average annual wages for the software industry in the United States between 2006 and 2016. Washington provided the highest average annual salary per employee of approximately \$211,000 in 2016. California was the second highest provider of employers paying workers an average annual wage of approximately \$201,000—\$53,000 greater than the national average of \$148,000.

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Figure 10: Annual Software Industry Average Wages National and State Comparisons



Note: States ranked 2-5 include: Texas (2), Washington (3), New York (4), and Massachusetts (5).
 Source: Bureau of Labor Statistics, Quarterly Census of Employment & Wages, U.S. Total, California, Texas, Washington, New York, Massachusetts, 2006-2016.



Source: Bureau of Labor Statistics, Quarterly Census of Employment & Wages, U.S. Total, California, Texas, Washington, New York, Massachusetts, 2006-2016.

COMPETITION

Endangering California's dominance in the industry are jurisdictions offering economic incentives in the form of tax credits, as well as regions that are creating, attracting, and retaining strong, talented individuals. In this section, we identify public policies and best practices that may be incentivizing and promoting industry development outside of California, and then present case studies to provide a closer look at the effect of such policies and practices in those regions. We recognize that many factors go into a business decision to (re)locate, and further analysis would be needed to directly correlate these efforts with increases in video game establishments and employment outside of California and lost opportunities for California. However, the incentives and efforts described here certainly reflect the desire to grow (perhaps even lure) the industry outside of California.

Tax Incentives

A tax incentive is an aspect of a jurisdiction's tax code designed to incentivize or encourage a particular economic activity. As the video game industry evolves, governments are experimenting with different types of tax incentives to attract and retain video game development, production, manufacturing, and publishing. California, for example, has a R&D credit over and above what the federal government offers. It does not, however, have any other interactive entertainment-specific incentives, whereas its competitors, Texas, Georgia, and Washington (as well as 18 other states) all offer digital media incentives to video game companies.

Production Tax Credits

Production tax credits vary by jurisdiction, but in the United States, they are generally characterized by a variety of incentives that lower the cost of production by providing an after-the-fact credit, rebate, or upfront cash grants based on qualified production expenditures. First used in California in the film production industry in the 1990s in an effort to reverse the trend of "runaway production" (productions made outside of a traditional region for consumption in that region because of lower production costs elsewhere),⁴⁸ 21 states now have formal video game production and development incentive programs. The programs range from 5 to 35 percent credits or rebates on qualifying expenditures and have various stipulations on the minimum project budget, in-state jobs, etc.



Sales Tax Exemption

A sales tax exemption is the removal of a tax liability on various types of property granted to certain individuals or firms. In addition to full exemptions, partial exemptions are sometimes granted to reduce the base tax. These incentives can be effective in generally lowering the cost of doing business by subsidizing the cost of equipment, construction costs, hotels, etc. Many states offer various forms of full or partial sales tax exemption that are industry-specific.

Research & Development Credits

R&D incentives are a common means of boosting innovation. In the U.S., the federal government provides a 20 percent tax credit “for increasing research activities.”⁴⁹ Qualifying expenses can include wages, contract research supplies, and equipment leasing. An advantage of the federal credit is that it does not preclude companies from leveraging state R&D credits as well. The state credits generally resemble the federal credit, with some states even expanding the credits. For example, while the federal tax credit allows rollover of unused credit for up to 20 years, some states have no limit or allow tradeable or refundable credits that specifically encourage research activity at small firms.

Small Business Incentives

Small businesses play an important role in driving job creation, raising wages, and elevating standards of living. Because almost 100 percent (99.7 percent) of video game companies qualify as small businesses and over 90 percent have 30 or fewer employees—incentives that benefit small businesses generally will benefit virtually all video game companies as well. Jurisdictions would do well to promote small businesses through tax incentives for startups or public support for incubators and accelerators serving them. These efforts are more local, but the state can do its part to ensure sufficient funding streams.

Education and Workforce Development

Investing in STEM education and workforce development is a long-term strategy to promote video game industry growth because firms tend to locate where they can draw from the best labor pool.⁵⁰ The addition of video game curriculums in higher education can have a significant effect as well. The ESA mapping study found a correlation between schools offering formal video game programs and an increase in video game companies 89 percent of the time. Per our interviewees, when companies cannot find qualified workers locally, they recruit from out-of-state and abroad. Video game company executives consistently remarked that supply is not meeting the demand for highly-skilled technology workers. The nonprofit Code.org estimates there will be more than one million computing jobs more than applicants by 2020, based on job creation projections by the U.S. Bureau of Labor Statistics and college graduation rate estimates by the National Science Foundation.⁵¹

Case Studies

Below we highlight several jurisdictions—some already dominant and others rising stars—to understand how a combination of government, education, and industry interventions can improve the business environment and incentivize a video game company to select a particular location for its business operations. These case studies provide an opportunity to examine the successes of California’s competitors, both to understand what attracts businesses to a particular location and to see ways in which California can continue to engage video game companies.

Texas

Texas ranks second in total video game employment and number of firms in the U.S. The state has 275 video game establishments and 44 schools offering video game programs,⁵² with Austin leading the way as the state’s hub, followed closely by Dallas and Houston. The state hosts headquarters and development studios of many prominent companies such as Gearbox, Certain Affinity, BioWare, and Arkane Studios. The tech sector directly contributes 7.2 percent to the Texas economy.⁵³

A substantial benefit to companies developing and publishing video games in Texas is the considerable tax incentives available to them. The Texas Moving Image Industry Incentive Program, a production incentive, provides film and video game projects the opportunity to receive a cash grant based on a percentage—up to 22.5 percent of a project’s eligible Texas expenditures, including eligible wages—paid to Texas residents. There is a minimum spending limit of \$100,000.⁵⁴ The program was created in 2008 and has been successful in bringing interactive media and film productions to the state. For example, developer Twisted Pixel relocated to Texas from Indiana to pursue grant money. The firm chose Austin because of the city’s large talent pool.⁵⁵

Texas also offers video game companies an up-front sales tax exemption on most items rented or purchased for direct use in production, refunds of the 6 percent State Occupancy Tax on hotel rooms occupied for more than 30 consecutive days, and refunds on the fuel tax paid on gasoline or diesel fuel. Another sales and use tax incentive, the Media Production Facilities Development Zone Act, is designed to encourage further development of permanent moving image production sites.⁵⁶ The video game company Certain Affinity is one of the first business to use the policy to build a brand new, expanded headquarters in Austin. Through the program, the state offers a two-year sales and use tax exemption for construction, maintenance, expansion, improvement, renovation, and equipping of production facilities.⁵⁷ Certain Affinity saved thousands on renovation costs and was able to construct a new facility that provides the company plenty of room to grow (the new building has capacity for about 300 employees; currently their staff is just over 120).⁵⁸

“As a bootstrap startup, Certain Affinity has benefited from participating in the Texas Moving Image Industry Program over the past 11 years. This is an important and critical incentive for small businesses like Certain Affinity as it has helped them with company stability, growth, and scalability.”

— Mojdeh Gharbi, VP of Marketing & Operations, Certain Affinity

While industry leaders and lawmakers frequently credit Texas’ tax policies with bringing a greater share of the industry to the state, state legislators have cut the budget for the Texas Moving Image Industry Incentive Program significantly. The legislature cut the program’s budget from \$95 million in 2014-2015 to \$22 million in 2017-2018.⁵⁹ Some lawmakers assert that the total program has a negative impact on the state by giving “hand-outs” to an industry that it cannot retain (especially in regard to film credits) and should not be a priority area.⁶⁰

Georgia

Georgia has emerged as a strong competitor in the entertainment industry, video games included. From 2012 to 2015, Georgia grew from 18 video game software publishing locations to 75, and now has 86 total locations and employs almost 50,000 people.⁶¹ In 2016, the Georgia tech sector was estimated to have an 8 percent direct contribution to the Georgia economy.⁶²

The state’s Entertainment Industry Investment Act provides a 20 percent tax credit for companies that spend \$500,000 or more on production or post-production and grants an additional 10 percent tax credit if the completed project includes a promotional logo provided by the state. Unlike many state programs, a company that incurs little to no tax liability can transfer or sell the credits.⁶³

In Georgia, video game companies benefit from production tax credits and a lower cost of doing business, while employees residing in cities like Atlanta enjoy a lower cost of living relative to cities like San Francisco and Los Angeles. Georgia also boasts a young population and a number of universities with digital entertainment programs.⁶⁴ The Princeton Review named the Georgia Institute of Technology and Savannah College of Art and Design as top colleges for game design. From 2015 to 2017, total game companies in Georgia nearly tripled as the number of higher education programs more than doubled.⁶⁵



Washington

With 247 game companies, employing a total of 6,166 individuals, Washington ranks third in number of firms and second in number of employees in the United States. The Seattle-Tacoma-Bellevue MSA is the state's primary video game industry cluster, home to anchors like Valve Corp., Nintendo of America, and Microsoft Studios.⁶⁶ The tech sector directly contributes 13.2 percent to Washington's economy, software being the leading field within the sector.⁶⁷

Washington's film tax incentive technically includes interactive media productions, but few video game companies in the state take advantage of the benefit. With allocations capped at \$3.5 million per calendar year, the total budget allotment is comparatively small, and the focus of the program thus far has been on traditional motion pictures, television episodes, and commercials.⁶⁸ However, the state's lack of individual income tax, corporate income tax, and capital gains tax provides substantial incentive for new or expanding game companies. The Washington Interactive Network, a nonprofit devoted to promoting the interactive media industry, names the state's high-tech workforce as the most compelling incentive to locate in Washington.⁶⁹

Other advantages include the state's video game education programs. DigiPen Institute of Technology has received national recognition as a top school in game design and the University of Washington is known for its extensive computer science program.⁷⁰ Academy of Interactive Entertainment in Seattle was one of the first institutions to offer qualifications in video game design and animation.⁷¹

New York

New York, a top state in the video game industry, is fourth in both employment and number of firms, and second in educational programs. It is also perhaps the state that is most like California in that it has an established creative cluster and existing infrastructure to support media and entertainment businesses. The video game industry grew from just 32 locations in 2009 to 231 in 2017.⁷² Like California, New York doesn't have an existing production tax incentive (despite pressure from legislators and the business community), but it does have a small business program to encourage startup firms in New York through tax incentives and partnerships with educational institutions. Many top video game companies are located in New York, including prominent publisher Take-Two Interactive, which is known widely for Grand Theft Auto. The broader tech sector is estimated to contribute 6 percent to the New York economy.⁷³

Advocates for a production tax incentive in New York argue that there are not enough developers to employ the high caliber of students coming out of top in-state video game programs at schools like Rochester Institute of Technology and Rensselaer Polytechnic Institute.⁷⁴ Lawmakers put legislation forward in 2016 to offer credits, only to have the governor veto the bill. Another bill has been proposed and enjoys support in both the assembly and senate for the 2018 budget.⁷⁵

Though not limited to video game companies, New York does have a program, START-UP NY, that helps new and expanding businesses in the state by providing tax-based incentives and facilitating innovative academic partnerships. The program, created in 2013, offers firms the chance to operate tax-free for 10 years if they are located near the state's college campuses.⁷⁶ While the success rate is not directly apparent, it highlights an attempt to attract and retain entrepreneurial advances, such as those in video gaming.

“The video game industry in New York has all the fundamentals to be a world-class economic engine for the state. We have talented students coming out of universities, great urban centers with culture and quality of life, and several companies that have consistently hit it out of the park with blockbuster video games. But we need the production tax credit to locate more projects here. That would help us hit a critical mass of companies to retain our young talent and reinvest in our communities. It can be the catalyst to take our industry from a handful of success stories to sustainable economic clusters that can shape the future of New York.”

— Guha Bala, President, Velan Ventures, Inc.

Canada

While Asia has the largest share of the global video gaming market, Canada poses a significant threat to the U.S. interactive entertainment industry due to its proximity, cultural similarity, and a combination of financial incentives and workforce development and education efforts. Just as it lured the American film entertainment market by implementing film incentives in 1997, Canada created a digital media fund in 2009 to incentivize video game production throughout the provinces. The number of active video game companies operating in Canada increased from 348 in 2009 to nearly 600 in 2017, with over 80 percent of the industry concentrated in Quebec, British Columbia, and Ontario.⁷⁷ Both Electronic Arts and Microsoft Studios have opted to expand operations in Canadian provinces.

At the federal level, digital media companies can receive support from multiple avenues. The Canada Media Fund grants funding to television and digital media industries, with financial contributions from the Canadian government and Canada's television distributors.⁷⁸ The federal government offers scientific research and experimental development (SR&ED) investment tax credits of 35 percent refundable credit on qualifying expenditures. Additionally, many Canadian provinces offer digital media tax credits.⁷⁹ For example, Ontario's Interactive Digital Media Tax Credit offers Ontario companies in the development of interactive digital products a 40 percent refundable tax credit on labor expenditures and marketing and distribution expenses.⁸⁰

With refundable digital media tax credits and SR&ED tax incentives at the provincial and federal levels, Canada is a lucrative location for game development. However, because of the industry’s rapid growth, the supply of highly skilled workers struggles to keep up with demand and technology companies often have to pull from a foreign labor pool. A Canadian research firm, Dawson Strategic, assessed Canada’s video game industry in 2016. The report recommends creating a national computing and digital skills strategy that addresses the digital skills gap, developing policies that encourage industry stakeholders to be active participants in digital skills younger education, and establishing a strong working partnership with the provinces.⁸¹

Companies themselves are also attempting to address the labor supply problem. For example, Ubisoft Montreal is investing more than \$8 million (CAD) between 2015 and 2020 to a program known as CODEX, a combination of video gaming and coding initiatives targeting all levels of education.⁸² This program demonstrates the greater national goal of improving game education and closing the digital skills gap in Canada.

“Gearbox has studios in Texas and Quebec, and we are expanding in both locations. Incentives have facilitated growth that likely would not have happened in a location without similar interventions, California included.”

—David Najjab, Director of Institutional Partnerships, Gearbox





Policy Analysis

California has a considerable lead in the interactive entertainment industry, but the industry is becoming more competitive each day. Today, all 50 U.S. states have a video game industry presence and 21 of those states offer financial incentives as a benefit of doing business in their region. To keep California in its dominant role, we explore the application and feasibility of tax incentives and small business and workforce investments below.

Production Tax Credits

Many supporters of a production incentive look to California's Film Tax Credit program, which allocates \$330 million per year, up from just \$100 million per year in 2009,⁸³ in tax credits for projects and allows qualified taxpayers to take a 20 to 25 percent credit against income or sales and use taxes based on qualified expenditures. Qualifying expenses can include crew and staff salaries, wages, and fringe benefits; cost of rental of facilities and equipment; production operations costs, such as construction, wardrobe, food and lodging, and post-production activities.⁸⁴

Some question the effectiveness of the film credit. A 2016 report out of California's nonpartisan Legislative Analyst's Office suggests scaling back the film tax credit, indicating that the program only boosted economic output by "a few hundredths of a percentage point."⁸⁵ However, the report also states it is "understandable to defend a flagship industry targeted by other states"⁸⁶ (this same point is emphasized in a 2014 Milken Institute report on the program that argues these credits are necessary for the industry to remain competitive⁸⁷). This rationale applies to the video game industry also, where California, a current leader in the industry, faces increased competition nationally and internationally from locations offering tax incentives.

There is also some question as to whether the implementation of a production tax credit would limit companies that already receive tax incentives elsewhere, whether through the existing research and development credits or otherwise. Ultimately, this would need to be addressed by the legislature, but there is support for having both types of incentives; other states have offered both production tax incentives and research incentives for companies to claim.

Advocates of a traditional production tax incentive for video game companies in California argue that unlike the film industry, interactive gaming companies offer sustained, high-wage employment that is not on a per project basis, meaning there is greater longevity and return on investment. There are many companies headquartered in California, but under those companies, development, production, and publishing may occur all over the world, often in locations that have incentives. For example, Electronic Arts has development studios in Texas, Florida, and Canada (in British Columbia, Alberta, Ontario, Quebec, and Prince Edward Island).

Sales Tax Exemption

California already has a partial exemption of sales tax for the industry classification for teleproduction and other production services, but that does not extend to video games because the industry classification is technically software publishing. The partial exemption applies to “the sale, storage, use or other consumption of machinery, equipment including component parts to a qualified person used primarily in teleproduction or other postproduction services.”⁸⁸ Applying that exemption to video games could be an effective means of bolstering the industry. California might also look to the manufacturing and research and development exemption. Businesses in the manufacturing or R&D industry classification qualify for a tax rate of just 3.3125 percent, which is less than half of the state’s usual 7.25 percent tax rate.

California has a considerable lead in interactive entertainment, but the industry is becoming more competitive each day. Today, all 50 U.S. states have a video game industry presence and 21 of those states offer financial incentives.

It is worth noting that while sales tax exemptions can be influential in lowering the cost of doing business, a number of stakeholders perceive sales tax exemptions as unlikely to bring business to a state on their own. General sales and use tax exemptions for established businesses amount to comparatively little when considering the entirety of a business’s expenses, such as salaries, contracted services, and facilities. However, when starting up a business or expanding, even partial sales tax exemptions could make a difference in initial infrastructure and operating costs. For example, Certain Affinity, a Texas company, used the state’s Media Production Facilities Development Zone Act to grow, building a brand new, expanded headquarters in Austin. The state, through the program, provides a two-year sales and use tax exemption for construction, maintenance, expansion, improvement, renovation, and equipping of production facilities.⁸⁹ The company had significant savings on renovation costs and was able to build a new facility with capacity for about 300 employees (allowing the company to bring on an additional 180 staff members).⁹⁰

“With any tax incentives, we need to build in metrics for deliverables. Language in the legislation that would require a certain number of new and additional workers, in-state graduate hires, and so on would go a long way in ensuring appropriate public benefit.”

— Assemblymember Evan Low (D-Silicon Valley)

Companies in other states that offer a similar credit have claimed that while not making a significant impact on a company’s operating costs, such credits help significantly with respect to cash flow (cash flow being especially important to a business that is considering expanding). A partial sales tax exemption could go a long way for a company that is adding employees to the payroll, building out to accommodate increased staff, or making a substantial investment in equipment.

R&D Credits

The R&D tax credit, the only state incentive available to all types of companies, is widely used by California video game businesses. Qualifying research is limited to certain activities—it must be technological in nature, intended to develop a new or improved business component, and pursued as a process of experimentation.⁹¹ The state offers a 15 percent credit on qualified research, and companies can claim it in addition to the 20 percent federal credit. Qualified research expenses can include wages, contractor, supply, and computer rental expenses and has no dollar limitation. While it is difficult to measure the impact of the California R&D tax credit (there is no sure way to know whether a particular economic activity would have happened in the state regardless), a *Topics in Economic Analysis & Policy* study concluded that the California program boosted R&D spending more than originally anticipated when the legislation was enacted in 1987.⁹²

A 2015 Milken Institute report, “California’s Innovation-Based Economy,” examined policy alternatives to enhance the California research and development tax credit. The report explored options such as tradeable credits, refundable credits for small businesses, and increasing credits altogether. Currently, credits that exceed a firm’s tax liability roll over year-to-year. But this is often not a benefit to startup firms that are unlikely to turn a profit for many years. In addition, this type of system places a long-term liability on the state’s budget. Instead, the report suggests that allowing tradeable credits or refundable credits for small businesses could increase the desirability of companies doing business in California.⁹³

The Milken Institute report also modeled the impact of doubling the credit from 15 to 30 percent. It found that while doing so increased total employment, gross domestic product, and personal income, doubling the credit had a negative fiscal impact on the state due to lost tax revenue.⁹⁴ Furthermore, California already has one of the more competitive state R&D tax incentives in the country, whereas a number of its competitors, including New York, Louisiana, and Georgia, have lesser or non-existent R&D credits. In Texas, companies have to choose between a sales and use exemption or an R&D credit.⁹⁵

Though video game companies benefit from the R&D credit, the terms and conditions of the credit apply equally to companies in all types of industries. Several stakeholders we spoke to suggested expanding the terms and conditions of the current California credit to benefit video game companies by allowing more of their specific activities to qualify as R&D. The state could analyze the credit to determine mechanisms to improve applicability to video games and interactive media more generally.

It is important to keep in mind that tax credits are generally subject to political whim. For example, despite the apparent success of the Texas Moving Image Industry Incentive Program, the state decreased year-over-year spending on the program from \$95 million for 2014-2015 to just \$22 million for 2017-2018 when some lawmakers said that “the state should not be picking winners and losers in a free market economy.”⁹⁶ Florida phased out its film incentives altogether when legislators, donors, and lobbyists called the program a “hand-out” to businesses.⁹⁷

Small Business Incentives

There are existing tax credits for businesses that want to grow in California. One such example is the California Competes Tax Credit from the governor’s Office of Business and Economic Development (however, to date, only one video game company, Riot Games, has taken advantage of this credit). Applications for the California Competes Tax Credit are available to businesses that want to establish or stay and grow in California. Companies need to commit to certain employment or project investment requirements.⁹⁸ Though it is a growth tax credit, it is intended for high-value businesses growing in California. The purpose is to attract and retain employers in California in industries with high economic multipliers and that provide their employees with good wages and benefits. To qualify for a portion of the allocation, the business must either have expansion plans that will create jobs in California over the next five years or be seen as at risk of leaving California. The number of credits available increased over several years: \$30 million in 2013-2014, \$150 million in 2014-2015, and \$200 million in each year through 2017-2018.

While more than 99 percent of video game companies technically qualify as small businesses, that does not necessarily mean “mom and pop” shops, with many having large operating budgets and impact. Still, the rapid growth in companies implies a rise of startups with smaller operations. From 2012 to 2015, California video game establishments jumped from 375 to 758, an over 50 percent increase. While some of these firms were part of larger companies, many were small developers attempting to gain ground. Supporting startups is essential for continued economic growth.

From 2012 to 2015, California video game establishments jumped from 375 to 758, an over 50 percent increase. Los Angeles County alone has 24 accelerators, 26 incubators, and 104 venture capital firms.

California has a notable culture of innovation, with creative and technology clusters throughout the state. Coordination of federal and state resources to local technology incubators and accelerators and providing financial support to other regional and local small businesses, as well as providing technical assistance could go a long way in encouraging video game companies to start up in California. According to the Los Angeles County Economic Development Corporation, Los Angeles County alone has 24 accelerators, 26 incubators, and 104 venture capital firms, benefiting startups and small businesses through technical assistance programs and increased access to capital.⁹⁹ A localized approach would also supplant any absence of state action for the time being.

Education and Workforce Development

California lags behind peer states such as Massachusetts and Maryland in STEM degree production. While the state ranked 11th in the Milken Institute’s “State Technology and Science Index” for human capital investment in 2016,¹⁰⁰ it is increasingly challenging to obtain a higher-education degree because of the high cost of tuition, in California and elsewhere. Also, a large percentage of STEM degree students at California universities are foreign and return to their home countries after graduation. Reforms in K-12 curriculum to encourage interest in STEM fields, including video game careers, could go a long way toward ensuring a talent pipeline of in-state students. Efforts to retain the students with job counseling would prevent some losses in future workers.¹⁰¹



California has the most formal higher education video game programs in the country, but simply having a program does not lead to graduates qualified for the specific jobs available or that qualified applicants find the right job. The video game industry, more than most other industries, relies on strong connections between educational institutions and companies to create a robust, technically trained workforce. Some collegiate video game programs facilitate this connection, but a more direct relationship between two- and four-year universities and K-12 STEM programs and the firms themselves could lead directly into job placement. For example, Santa Monica College's (SMC) new baccalaureate program in interaction design has a direct line to companies in Silicon Valley. They hold frequent information sessions and panels on the industry and facilitate internships and mentorships through partnerships with firms.

We cannot overstate the importance of strong talent pipelines to the video game industry. If there are not qualified applicants, companies cannot prosper. We interviewed a company, which preferred to remain anonymous, that had invested heavily in development studios in Louisiana, but will not expand on account of a talent shortage. Initially, the state's generous production tax credit attracted the company, but the state has not provided the education necessary for students to excel in the video game industry, leading to a shortage of qualified local applicants. The company pointed to Canada, where they invest in the infrastructure and talent, as an example of doing it right. Canada struggled with its supply of high-tech workers in the past, but now the provinces house many distinguished university game development programs and focus on coding skills in secondary education. Additionally, relatively liberal immigration policies can lead to a foreign worker visa in a matter of weeks.

A workforce training or education incentive, such as additional funding to STEM education programs or technology workforce development programs, benefits other industries in addition to video gaming. Coupled with the already existing infrastructure of established video game companies, California has the potential to foster mutually beneficial relationships between large companies, emerging companies, and educational institutions.

Quality of Life

Some industry stakeholders in states other than California voiced concern about educating the next generation of tech employees just to have them go to California where there are jobs and plenty of sunshine. It is true that California is a desirable place to live, especially for individuals in the technology and creative industries. However, California has one of the highest costs of living in the nation and the state's housing affordability crisis shows no signs of abatement, especially in the video game industry meccas of Los Angeles and the Bay Area where housing is the most expensive. California is already losing talent to states that offer high wage jobs, a lower cost of living, as well as in-demand cultural and community amenities. According to a U.S. Census Bureau report, in 2015-2016 video game hubs like San Francisco and Los Angeles each showed net out-migration of over 5,000 people, while Austin and Dallas each gained more than 5,000 people.¹⁰² While outside the scope of this report, California must address its affordability crisis to be competitive in any industry.

“The impact of skyrocketing housing costs on workers has video game companies very concerned about their ability to expand or remain located in California. If we want to keep California as ground-zero for the video game industry, we must do all we can to boost housing supply while protecting our existing communities from displacement.”

—Assemblymember Richard Bloom (D-Santa Monica)

RECOMMENDATIONS

California has maintained a leading position in the video game industry since its infancy and continues to serve as the headquarters of several of the largest video game publishers not only in the United States but the world. However, like its counterpart in Hollywood, the comparative advantage of having a lead in video game employment and corporate headquarters may not be enough to maintain California's consistent growth in the industry or to remain a leader in fostering the small development studios that are so essential to California's edge in both video game production and employment. The state should consider certain key policy actions to assist the industry and help California retain the many benefits of this lucrative industry.

Adapting the Teleproduction or Manufacturing Sales Tax Exemption to Apply to Video Games: Making changes to existing teleproduction or manufacturing sales tax exemptions to apply them to the video game industry could potentially have a significant impact both for larger and smaller firms in California. When combined with an increased investment in video game workforce development, an exemption designed to encourage investment in new computers, software, rendering engines, and other key components could provide a significant boost not only to more established video game publishers and developers, but also newer companies focused on emerging technologies. Increased expenditures in human capital and technology equipment could provide an effective means of future-proofing the state's video game industry.

Expanding or Revising the Research and Development Tax Credit: Currently, California has one of the more generous R&D tax credits in the country. This has proven to be the one current incentive most beneficial to video game companies. While a broader expansion of the credit is unlikely, a revision of the credit to allow it to apply more readily to video game development and the underlying technologies would further encourage investment in the state. Additional changes to enable smaller studios with little or no tax liability to transfer or get a refund of accrued credits could also have clear benefits.

Developing a Production-Based Credit for Video Games: As competition continues to heat up for big-budget video games, many of which have both budgets and revenues on par with Hollywood blockbusters, several key competing states have started offering production credits. Offering similar credits in California to video game companies would immediately place the state in a comparatively advantageous position due to the already existing facilities and the high concentration of current talent in video game clusters. However, the political likelihood of passage of such a credit is low for two specific reasons. First, while other states are undoubtedly on the rise, California is not yet showing signs of an evident decline—a key factor in the passage of the film incentives within the state. Second, two of the most important areas in video games where California has had more difficulty competing—namely mobile games and independent studios—will be less likely to be covered without an uncapped credit, which is all but impossible under the current political climate. That said, if California sees an extended trend of decline and underperformance relative to other states and countries, a stronger political case for production-based credits can and should be made.

Improving Development of In-State Computer Programmers and Developers: To ensure that California continues to be a center of new games, rendering models, and other key advances in video game technology, it is essential that the state be able to supply enough qualified graduates to meet the continuing workforce demands of the video game industry. Although several strong programs exist in the state for producing video game designers, developing a stronger direct relationship between public two- and four-year universities and the sector would result in more job placements for California residents and could satisfy video game companies' needs for a talented workforce without their having to recruit from out-of-state.

We recommend California take steps now to future-proof the video game industry in California, retaining and attracting industry players, and, with these, the benefits enjoyed by the state and its residents.

APPENDIX: STAKEHOLDERS

We would like to thank those stakeholders who contributed invaluable input to this paper:

Activision
California Assemblymember Richard Bloom
Certain Affinity
Electronic Arts (EA)
Entertainment Software Association
Games for Change
Gearbox
Higher Education Video Game Alliance
California Assemblymember Evan Low
California Assemblymember Al Murasutchi
Congressman Scott Peters (D-52)
Sony Interactive Entertainment
Survios
Take-Two Interactive
Ubisoft
University of California, Irvine
University of Southern California
Velan Ventures, Inc.
Vicarious Visions
Warner Brothers Interactive
Steve Weizenecker



ABOUT THE AUTHORS

Rebecca Simon is a policy analyst at the Milken Institute’s Center for Regional Economics. She focuses on community and economic development through strategic industries, infrastructure, and human capital investment. Prior to joining the Institute, Simon worked in San Francisco for a nonprofit legal advocacy organization, where she collaborated with local leaders on matters related to economic justice and empowerment. Most recently, she worked for the City of Glendale’s urban design and mobility division, addressing critical transportation and development issues. Simon holds a bachelor’s degree in political science from Villanova University and dual master’s degrees in public administration and urban planning from the University of Southern California.

Kevin Klowden is executive director of the Milken Institute’s Center for Regional Economics and a managing economist at the Institute. He focuses on issues connected to job creation, technology-based development and California’s role in the global economy. Klownden is the lead author of numerous publications, including “A Hollywood Exit: What California Must Do to Remain Competitive in Entertainment—and Keep Jobs” as well as “Strategies for Expanding California’s Exports” and “A Golden Opportunity with China: How California Can Become an Even Bigger Destination for Chinese Foreign Investment.” He has written about the importance of a skilled and educated workforce in maintaining California’s competitiveness, the effects of transportation and freight infrastructure on job growth, and the essential role of technology in economic development. A frequent speaker, he currently serves on multiple advisory boards, including the recently established Trade Finance Advisory Committee for the U.S. Department of Commerce. Klownden holds graduate degrees from the University of Chicago and London School of Economics, where he studied Asian financial centers and foreign direct investment.

Carolyn Karo Schulman is a director for strategic initiatives at the Milken Institute Center for Regional Economics. She develops and manages research reports, programs, and initiatives related to small business, community development, workforce development, and business climate. An experienced strategist and manager, Schulman specializes in synthesizing and translating complex and technical information for broader audiences, using these skills to maximize the impact and reach of the center's work. Previously, she held positions in public affairs and strategic communications at Finsbury and Ichor Strategies. Earlier, she served as director of policy for the New York City Comptroller's Office, addressing economic development, pension reform, and education. Schulman started her career in community development at Citi, where she served on the Community Reinvestment Act team, working with Citi's retail, credit card, and investment banks to satisfy their regulatory obligations. She holds a B.A. from Brandeis University and a master's degree in public policy from the George Washington University.

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SANTA MONICA

1250 Fourth Street
Santa Monica, CA 90401
P +1.310.570.4600

WASHINGTON

1101 New York Avenue NW
Suite 620
Washington, D.C. 20005
P +1.202.336.8930

LONDON

23 Savile Row
London W1S 2ET UK
P +44 (0) 207.043.5926

SINGAPORE

8 Marina View #15-05
Asia Square Tower 1
Singapore 018960
P +65.6636.2507



MILKEN INSTITUTE