# Interactive Media Industry Assessment

## Economic Development Council of Seattle & King County
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cai community attributes inc

Economic Development Council
of Seattle and King County

WIN WASHINGTON INTERACTIVE NETWORK

*Community Attributes tells data-rich stories about communities
that are important to decision-makers.*

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# EXECUTIVE SUMMARY

In 2007, enterpriseSeattle (now called the Economic Development Council of Seattle and King County) commissioned an Interactive Media Cluster Study with the purpose of providing a knowledge foundation that could be used to leverage and grow businesses and economic activity within the Interactive Media Cluster in the Puget Sound region as well as throughout Washington State. Community Attributes updated this study in 2012 to assess changes that had occurred since the 2007 study. In 2013, the Economic Development Council of Seattle-King County and the Washington Interactive Network commissioned an update to the previously conducted studies to assess the Cluster's growth in jobs and businesses, as well as new or remaining challenges and opportunities to continue to support this important regional industry. This study incorporates quantitative and qualitative analysis of Cluster strengths and discusses the future direction of the Industry.

The Interactive Media Cluster relies on a robust support system to fuel its growth, including devices, content and communication systems.

- Devices include mobile, game consoles, laptops, desktops and television platforms.
- Content ranges from entertainment to educational and training applications.
- Communications networks, such as social media outlets, are used to share and promote games, animations, and more.

Cluster support industries include a distribution network to deliver games to the consumer, professional services such as venture capital businesses, banking and finance, real estate and legal advising, information and communications technology infrastructure (ICT), and perhaps the most critical element—a talented workforce, along with the research and educational institutions that underpin that workforce.

The IM Cluster in the Seattle area has significant economic impacts for the region and the State. Since 2005, Washington has led the country in employment in Software Publishing, an industry which underpins IM's success. With over 97,000 occupations related to Interactive Media production in 2012 in the Seattle area, Seattle is ranked fourth in the country in per capita IM employment. Most of these occupations in this Cluster pay high wages, and this investment in workers has positive effects for

industries from real estate to finance across the region.

Total Interactive Media revenues in Washington in 2013 are estimated to be $19.2 billion. Revenues of small and medium-sized firms increased from $8.0 billion (2013 dollars) in 2010 to an estimated $9.6 billion in 2013. Total revenues, including all firm sizes, grew to $19.2 billion in 2013, of which slightly more than half were generated by activities within Microsoft.

The Interactive Media Cluster directly employed an estimated 17,400 workers in 2013, including nearly 2,700 freelance workers, 8,300 workers within small and medium-sized firms, and 6,400 workers in large corporations, including 5,500 within Microsoft in support of Xbox and other Interactive Media activities. There were an estimated 330 companies in the Cluster in 2013, plus many more self-employed workers.

Multiplier effects are also significant. The total revenue impact of the Interactive Media Cluster statewide is an estimated $36.3 billion. The Cluster also supports—either directly or through multiplier effects—statewide labor income of $6.1 billion and as many as 76,200 jobs.

The Cluster is changing quickly; new funding structures and distribution channels have allowed companies and startups to get their product to market quicker and cheaper. The Cluster looks forward to growth and innovation in interactive television and other new platforms, new serious applications and the combination of social, interactive and linear games.

# Introduction

## Background and Purpose

In 2007, the Economic Development Council of Seattle and King County (then called enterpriseSeattle) commissioned Community Attributes to perform a Cluster study of the Interactive Media Industry, which highlighted the importance of the Cluster to the regional and state economy. The study identified the rapidly growing number of jobs in the Cluster, high wages and exciting career opportunities that attract a strong talent base. The report emphasized future growth, emergence of new entertainment markets and continued strength of Seattle as a hub for the Industry. The most significant challenge then was attracting the talent to support growth.

In 2012, the Economic Development Council of Seattle and King County desired an updated assessment of the Interactive Media Cluster. That study gauged economic activity connected to Interactive Media production based in Seattle, including the greater Seattle Metropolitan Area and the impacts for all of Washington State. The study included a quantitative and qualitative review of the Interactive Media Cluster that informed and promoted this important, growing industry.

Upon receipt of a federal grant to grow and accelerate Interactive Media industry in the region, the Economic Development Council of Seattle and

King County commissioned an update of the Interactive Media Cluster Study for 2013. The industry continues to experience rapid evolution and growth, and this study includes updates and refinement of previous work, and draws qualitative findings from industry-wide online and in-person surveys.

These findings are meant to provide an understanding of the Clustering of economic activity within the regional economy, highlighting opportunities to focus and support economic development efforts in support of this key industry.

### Methods

This report relies on secondary data analysis and primary data collection. Secondary data analysis draws from data compiled by public agencies including the Washington State Employment Security Department and Department of Revenue, the U.S. Bureau of Economic Analysis and additional publicly available data. For this study, companies counted in the Interactive Media Industry self-identified as Interactive Media companies through participation in the Washington Interactive Network and other targeted events. Revenue and employment data were collected using participating businesses' Unique Business Identifiers (UBIs) to calculate overall economic impacts.

Primary data were collected through online and phone surveys of past participants in the Washington Interactive Network's WIN REACTOR in October 2013, as well as supplemental interviews with leaders in the Cluster. Surveys and interviews focused on business needs for growth, locational advantages, and outlook for the future of the Cluster.

### Organization of Report

The Interactive Media Industry Assessment includes the following sections:

- **Cluster Overview.** An overview of the Interactive Media Industry in King County and statewide, including history and conceptualization of the Cluster, transfer of technologies from IM to other sectors, an analysis of Washington's comparative advantages and support for the Cluster, and trends affecting the Cluster.

- **Industry Perspectives and Trends.** Findings from Interactive Media experts. Summary of the key findings that shape an understanding of opportunities in the Cluster.

- **Measures and Impacts.** Data summaries of businesses, revenues, employment and other metrics that demonstrate the size and relevance of the Industry in Washington State.

- **Industry Workforce Assessment.** Analysis of the occupations that define the Industry's workforce, along with wages and educational attainment of dominant employee classes of the Interactive Media workforce. This includes an assessment of projected occupational gaps in the Cluster into the future.

# INTERACTIVE MEDIA CLUSTER OVERVIEW

## Interactive Media Definition

The definition of Interactive Media is ever evolving. In the past, Interactive Media was defined by video games, networked software applications, digital music distribution and other Internet technologies. Today, the proliferation of devices, the ubiquity of screen-based content delivery and cloud services provision was widened the breadth of companies considered part of Interactive Media.

Increasingly, the industry is typified by companies who develop and distribute games, applications for mobile devices and tablets, and provide services online including advertisers and retailers. Software development, web development and design, and animation are key occupations in Interactive Media.

Emerging trends in the field of Interactive Media include the convergence of content and technology. Content and the means of distribution strongly overlap. Apps are built as a means to disseminate brand marketing, public policy information, and to provide outlets for creative content. Cross-platform delivery is emphasized, ensuring consumers can access content on mobile devices, tablets, personal computers, game consoles, and on increasingly interactive televisions.

New distribution channels and funding models have democratized how content is produced and distributed. While the traditional model of using a recognized publisher is still used by more established IM businesses, content creators are using a diversity of networks including social media and crowd-sourced funding to get games to market.

Content is highly social and shareable, with integration between games, apps, video, and audio content with social networks and new media outlets such as Facebook, Twitter, Tumblr, Instagram, and others.

### Primary Game Industry Segments

In the initial report, four distinct but overlapping segments were defined. These segments continue to comprise the Industry: Core, Casual, and Serious, games along with MMORPG/Social Networks. These four segments of the gaming industry have not changed since the initial report, but the market for casual gaming has increased since the initial 2007 report.

- **Core.** Games developed for personal computers, television game consoles (currently led by Microsoft Xbox One, Sony PlayStation and Nintendo's lineage of consoles including Wii and Wii U) and handheld video game hardware. With core games, the narrative, the mechanics, or

both, are sophisticated and require some learning to participate in all features.

- **Casual.** Card games, puzzles and relatively simple animated games typify casual games. Distinguished primarily by the simplicity to learn, play, quit and resume, casual games are often free or inexpensive. Mobile games primarily include casual games, with mobile platforms rapidly increasing market penetration.
- **Serious.** This term has evolved to include all Interactive Media designed for formal learning or training, such as flight simulators. Fields where Interactive Media contribute to training include aerospace, military and medical applications.
- **MMOG/Social Networks.** New to the definition of Interactive Media, this category comprises social networking services like Facebook and Twitter as well as interactive virtual environments like Second Life and World of Warcraft, commonly known as Massively Multiplayer Online Games (MMOG). In both
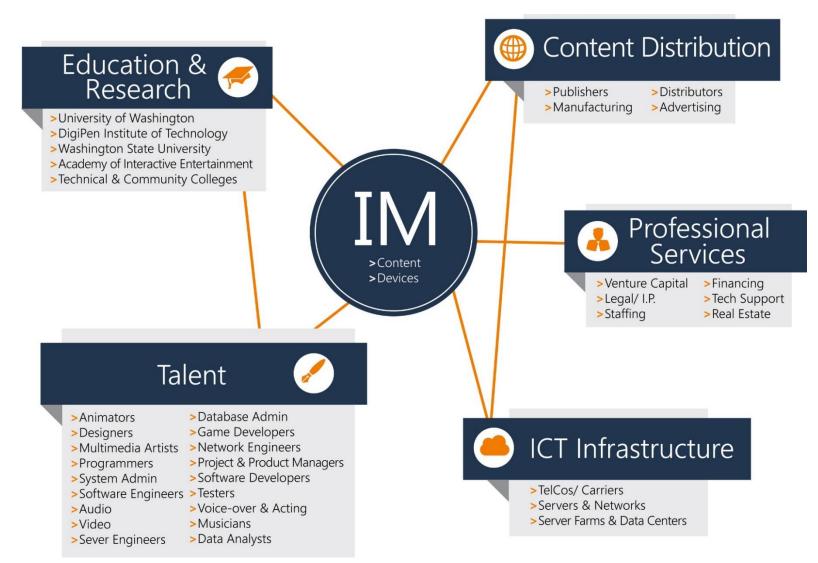
cases, the user is part of an interactive online community.

The presence of Interactive Media anchors such as Microsoft and Adobe heavily influence the Interactive Media Cluster. These anchors, while inextricably linked to the regional economy and Interactive Media Cluster, also act somewhat independently of regional economic linkages.

## Cluster Mapping

The Interactive Media Cluster includes both content and devices, which interact with and rely upon other areas and sectors. Broadly, education and research train the workers and advance the field of knowledge. Workers fill occupations for businesses either directly in Interactive Media or in support services. Support services in turn provide infrastructure and professional services to businesses in Interactive Media. **Exhibit 1** provides a visual example of how these various elements combine to create and support the Interactive Media sector.

# Exhibit 1. Interactive Media Cluster Map



## Education & Research
- University of Washington
- DigiPen Institute of Technology
- Washington State University
- Academy of Interactive Entertainment
- Technical & Community Colleges

## Content Distribution
- Publishers
- Distributors
- Manufacturing
- Advertising

## IM
- Content
- Devices

## Professional Services
- Venture Capital
- Financing
- Legal/ I.P.
- Tech Support
- Staffing
- Real Estate

## Talent
- Animators
- Database Admin
- Designers
- Game Developers
- Multimedia Artists
- Network Engineers
- Programmers
- Project & Product Managers
- System Admin
- Software Developers
- Software Engineers
- Testers
- Audio
- Voice-over & Acting
- Video
- Musicians
- Sever Engineers
- Data Analysts

## ICT Infrastructure
- TelCos/ Carriers
- Servers & Networks
- Server Farms & Data Centers

*Source: Community Attributes, 2013.*

# INDUSTRY HISTORY AND TIMELINE

## Exhibit 2. Interactive Media Timeline

**apple**
Boeing/Apple2
1980

**Microsoft Flight Simulator**
Launched
1982

**MICROSOFT**
Decathlon Games Released
1982

**Nintendo**
Released NES Console
1985

**GAME BOY**
Released
1989

**Wizards OF THE COAST**
Founded
1990

**STARWAVE**
Created by Paul Allen
1994

**Microsoft DirectX**
Formed
1994

**amazon**
Launched
1994

**SIERRA**
Relocates HQ to Bellevue
1994

**real**
RealNetwork created RealAudio
1995

**DigiPen INSTITUTE OF TECHNOLOGY**
Located in Redmond
1998

**Disney**
Acquired Starwave
1998

**Microsoft**
Bungie Acquired by Mircosoft
2000

**Xbox**
Xbox Launched
2001

**PopCap**
PopCap Released Bejeweled
2001

**HALO**
Halo: Combat Evolved Released
2001

**UNIVERSITY** *of* **WASHINGTON**
UW creates Center for Digital Arts & Experimental Media (DXARTS)
2001

**BIG FISH Games**
Founded in Seattle
2002

Valve invents Steam
2002

**5THCELL**
Founded in Bellevue, WA
2003

**WB**
Acquires Monlith Productions
2003

**COUNTER STRIKE**
Valve releases
2004

**Google**
Expands to Fremont
2004

**DX:ARTS**
DXARTS offers PhDs in New Media Arts (First in the U.S.)
2004

**SONY**
Sony Online Entertainment Inc. opens gaming studio in Bellevue
2005

**Wii**
Nintendo launched
2006

**WildTangent**
Introduces the first virtual currency
2006

**kindle**
Amazon introduces
2007

**VALVE**
Release Portal
2007

**Google**
Adds office in Kirkland
2007

**BUNGIE**
Becomes independent from Microsoft
2007

**W**
UW Foldlt crowd-sources complex scientific questions as a game
2010

**HALO**
Halo: Reach
Sells 3 million copies in one day
2010

**facebook**
Expands to Seattle,
first office outside CA HQ
2010

**BIG FISH Games**
Reached 1 Billion
Game Downloads
2010

**KINECT**
Microsoft Sells 8 Million
units in 60 days
2010

**PAX**
Record attendance at Seattle's
Penny Arcade Expo
2011

**kindle fire**
Amazon introduces
2011

**PORTAL 2**
Valve Released
2011

**EA**
Electronic Arts
acquires PopCap Games
2011

**zynga**
Zynga expands
to Seattle
2011

**UNIVERSITY of WASHINGTON**
Opens the Center for
Game Science
2011

**Forbes**
Ranks Seattle #1 of 51 metropolitan
areas for high tech job growth
2011

**AT&T · T**
Merger between AT&T
and T-Mobile blocked
by FCC, Dept of Justice
2012

**EPIC GAMES**
Lauches a Seattle Studio to
foucs on Unreal Engine 4
2012

**Wii U**
Nintendo released
2012

**XBOX ONE**
Microsoft releases
Xbox One
2013

**PS4**
Sony Releases
PlayStation 4
2013

Benaroya Hall Hosts Valve's
Int'l Dota 2 Championships
2013

*Source: Community Attributes, 2013.*

## Technology Transfer

Interactive Media technologies are used in myriad different applications ranging from educational, to cutting edge research, to medical purposes. This section explores the diversity of uses for IM technologies.

### Training & Simulation

Beginning with Microsoft Flight Simulator, pilots have been trained to fly their aircraft on high-quality simulation programs long before they ever set foot in the cockpit. This is an example of how IM technologies are used extensively and increasingly for applications in other industries. Especially in the medical industry, Interactive Media is used to train surgeons, solve complex biological problems, and even reduce pain in patients.

Other creative uses for IM include exercise training games, engineering simulation software, and military training. Zombie Studios, based in Seattle, was commissioned by the Department of Defense to develop military training and recruitment games. America's Army was originally released in 2002, and Zombie has developed sequels since then as well.

### Problem Solving and Distributed Computing

Simulation and artificial intelligence can be combined with crowd-sourced collaboration between players who provide spatial reasoning to solve complex problems. One example of this is the spatial game Foldit. Players of the game were given a 3-D model of an enzyme that plays a key role in the development of a virus similar to HIV. Scientists at the University of Washington had been working toward finding the enzyme's chemical key for ten years, but failed because each enzyme has millions of possible combinations in which it can fold its atom bonds, presenting a processing conundrum for even the most powerful computers.

With no medical training, Foldit players were able to collaborate and build on each other's work, and they discovered the most energy efficient enzyme structure in less than 10 days. Player's actions were recorded in an effort to improve the algorithm so that eventually the computer will be able to do the same thing without input from gamers. Now that scientists know the solution to the enzyme's chemical key, they can better understand how to attack HIV.[1]

### Pain Reduction

At The University of Washington, a virtual reality program has provided pain relief in burn victims during wound treatment. Because pain has a significant psychological component, distraction through immersion in virtual reality has shown to reduce pain-related activity in the brain. Additionally, patients reported reduced pain when immersed in virtual reality versus traditional video

games. Other virtual reality programs have been developed for PTSD and phobia desensitization therapies.[2]

### Medical Training

Since the advent of minimally invasive surgery, simulation has been used to train surgeons for in-person as well as robotic surgery. Mimic Technologies, spun-out of the University of Washington in 2001, and headquartered in Seattle, has pioneered a skills trainer for robotic surgery. Robotic surgery systems are expensive to maintain and to use, and training systems such as Mimic's reduce the cost of these systems by freeing up the technology to be used for actual surgeries instead of training. The surgeon is able to seamlessly move from training module to surgical system, contributing to better patient outcomes.[3]

Another potential platform for IM is Google Glass, which is currently being tested by trauma surgeons at Harborview Medical Center. The device allows doctors to pull up a patient's chart, to get lab results, or to share with experts around the world. The advantage of Google Glass is that the surgeon would not have to put down her surgical instruments or turn away from the patient on the operating table.[4]

### Educational Interactive Media

Headsprout was founded in 1999 to develop tools to develop early reading skills in kids ages K-5.

Curriculum is web-based, interactive, and fun, and is backed by educational testing firm Kaplan. In 2011 the company was acquired by Dymo/Mimio. The Seattle-based company counts about 700 school districts as clients, as well as parents. Districts pay $30-$60 per student to access online curriculum.[5]

Similarly, McGraw Hill Education, based in Bothell, creates online learning curriculum for grades K-12. McGraw Hill Education has products including a virtual world designed to help kindergarten through 3rd grade students practice math, as well as project management software for students working on group projects.[6]

Based in Bellevue, Dreambox Learning was founded in 2006. The company creates adaptive learning software for math curriculum specifically, and counts students in all 50 states as users of the product. In 2010 the company was acquired by Charter Fund in partnership with Reed Hastings, CEO of Netflix. With a new round of investment, the company will expand its curriculum, distribution, and adoption.[7]

Livemocha is an online language learning community, providing curriculum in 35 languages. The curriculum utilizes the power of social networking with an emphasis on active participation for learning languages. The community has over 16 million members from over 195 countries. Livemocha was founded in 2007 in Seattle, and was acquired by Rosetta Stone in 2013.[8]

# Comparative Advantages & Support

## Tax Incentives

Incentives play a crucial role in Interactive Media companies' decisions of whether and where to start up, to headquarter, and to relocate. Washington offers one of the most competitive tax environments for an IM company in the country, outlined below.

While Washington's Department of Revenue previously extended a B&O tax credit for research and development activities in Washington, this was not renewed in 2015's legislative session. However, the legislature did pass a new crowdfunding bill which allows businesses to raise money from crowdfunding campaigns, including from non-accredited investors.[9]

Other major incentives for the high-paying IM sector include Washington's lack of a personal income tax, combined with no state capital gains tax (while California has the second highest individual capital gains tax).

Support for IM companies extends beyond a favorable tax climate. The City of Redmond is the State's designated Interactive Media and Digital Arts Innovation Partnership Zone, which is a formal designation by the State Department of Commerce that promotes "unique hubs of innovation, education, expertise, and work force training within close geographic proximity to further job creation and entrepreneurship".[10] These zones work across research and industry to provide internship opportunities, to incubate Startup companies, to develop training programs, and to utilize technologies in new ways.

Washington Interactive Network (WIN) is a local nonprofit with the purpose to promote, nurture, and grow the Interactive Media Industry in the region. For the last 10 years, the organization has developed programs to help educate entrepreneurs and develop workforce in this Cluster. WIN's accelerator, called REACTOR, is one such tool, modeled as a professional guild to accelerate IM in Washington. In the last five years has created and retained over 2,500 jobs in the Puget Sound Region.[11]

Seattle's Office of Economic Development has also fostered a strategy to "support early-stage technology companies, expand the number of startups, and firmly establish Seattle as an internationally recognized home for emerging technology companies".[12] The initiative includes efforts including startup outreach, forming new partnerships and expanding opportunities in the technology sector, place making, and broadband infrastructure improvements.

While IM in Washington State is more established than in other areas of the country, tax incentives continue to be a key tool in influencing the playing

field for companies in all stages of the business cycle. Incentives programs exist across the country and vary widely, from Puerto Rico's generous 40% tax credit on wages and production costs, to Colorado's rebates on 20% of Colorado expenditures.[13] Other notable competitive incentives are described below.

**California Incentives**

San Francisco's Enterprise Zone includes income tax credits for each qualified employee hired over 5 years, a sales and use tax credit on purchases of qualified machinery and parts, and a tax credit of $3,000 per each additional full-time employee hired for businesses with 20 or fewer employees. Companies can take advantage of an Employment Training Panel which can help provide funds to offset the costs of skills training, as well as an incentive including payroll tax exclusion for businesses located in the disinvested Tenderloin district of the city.[14]

The State of California extends a research and development tax credit, which allows companies to receive a 15 percent credit for qualifying research expenses. Eligible expenses include technology such as computer science or engineering.[15]

Recently, the state's Franchise Tax Board eliminated a tax break on capital gains for small business owners and investors. Previously, entrepreneurs and early-stage investors took advantage of a partial

state income tax exclusion on sales of stock of an eligible small business.[16]

**Texas Incentives**

Video game companies that spend at least $3.5 million in Texas can now apply for a 20 percent base reimbursement from the Texas Film Commission, Governor Rick Perry's economic development office for technology, film, and television industries. Companies also enjoy a sales tax exemption on production equipment. Prior to the current incentive structure, the maximum reimbursement rate was 15%, and companies had to spend at least $5 million to qualify for the tax incentive. The state will not release how much these incentives contribute to revenues in the state, but companies that received incentives from the film commission in 2012 spent $52.5 million in the state. This aggressive incentive structure and the fact that Texas has no personal income tax mean that Texas is likely to continue to attract IM talent and employment.[17]

**North Carolina Incentives**

North Carolina's favorable tax environment reinforces the research triangle as a hub of the gaming industry for the East Coast. Credits are awarded for taxpayer's expenses that exceed $50,000 during the taxable year in development phases, and may not exceed $7.5 million. Credits include 15% of compensation and wages for a full-time employee, fringe contributions on

compensation and wages, and other expenses, as well as 20% of research expenses paid to North Carolina universities, or community colleges. [18]

**Oregon Incentives**

Reaching out to smaller IM companies, Oregon just extended tax credits to "media production services" in addition to filmmakers. Under the new credits, video game developers can now apply to receive up to 20% back on goods and services and 10% back on labor used in the production of video games. The rebate only covers the first $1 million of a project, and a company is only eligible if the project budget is between $75,000 and $1 million.[19] Additionally, the tax credits can only be used to hire local talent.

## Infrastructure

Interactive Media relies on the ability to house and process large amounts of data, as quickly as possible. In Washington, this is accomplished through competitive energy rates which allow data centers (generally in Eastern Washington) to support the heart of the technological Cluster on the western side of the Cascades.

### Competitive Energy Rates

Due to its dependence on hydroelectric energy, Washington is home to some of the lowest-cost energy in the nation. Eastern Washington takes advantage of this reliable and low-cost energy by locating server farms and data centers close to the highly dependable energy source. Quincy, Washington, is home to six data centers supporting companies including Microsoft, Dell, and Yahoo.[20]

The advantages to Interactive Media locating near the data centers supporting them have to do with the concept of lag in gaming. Lag refers to a time period between input and response in computing. Data can only travel as fast as the speed of light and distance between the data center and the client can lead to a lag in response time for the user. For Interactive Media, this means that gamers experience frustrating delays, influencing the highly important concept of user experience. Companies will pay more to have their servers hosted closer to

them to reduce lag; Downtown Seattle is home to several data centers.

### Cloud Computing and Gaming

Recently, Madrona Venture Group called Seattle the "cloud capital of the world"[21]. Amazon Web Services and Windows Azure are the top two cloud computing services available for technologists, both of which are physically rooted in Seattle's cloud infrastructure. Cloud and distributed computing is increasingly popular for a wide range of clients, which renders technology services cheaper, easier, and faster than in the past. Cloud gaming is also increasingly popular. The advantage is that rather than having the content of the game on the user's device, files are streamed, which allows quicker access to games with low bandwidth internet connections without lag. Sony recently announced that it will launch a cloud gaming service for the Play Station 4 and 3, powered by Gaikai.

### Broadband Internet

Recognizing the importance of connectivity to the technology industry that lives here, the City of Seattle has invested in expansive broadband and fiber optic networks along with private partner Gigabit Squared. The City's goal is to use its existing "dark fiber" network of over 500 miles of unused fiber as a backbone for their new fiber broadband network[22]. Currently, the investment has been made

in 12 neighborhoods across the city, including South Lake Union, Capitol and First Hill, the Central District, Northgate, the University District, and Ballard neighborhoods. Internet users in these neighborhoods can use broadband that is up to 1,000 times faster than what is currently available.

**Commercial Real Estate**

Seattle is now considered one of the top places to invest in real estate, due to its high rates of educational attainment along with growth of the tech sector[23]. Office vacancy rates in the Seattle metro area are at an all-time low, driven by expansion of technology companies such as Amazon, Zulily, and Google. Amazon has transformed the South Lake Union neighborhood as well as Denny Triangle, Zulily has plans to lease 2/3 of the 332,000 square foot building previously occupied by RealNetworks in Belltown, and after a year in Seattle, Twitter's Seattle office will be moving to a 16,000 square foot space in Downtown Seattle in 2013.[24]

Pioneer Square and Fremont (also known as the "Silicon Canal") are other neighborhoods where multitudes of technology companies have located. Amenities like coffee shops, restaurants, and convenient transit lines afford employees a diversity of choices, while also facilitating employers in the arena of ever-competitive talent retention. Interactive Media tenants in Pioneer Square include

Wild Tangent Seattle, CrashShop Design Inc, and Undead Labs; Fremont tenants include Adobe and Google.

**Culture and Environment**

Workers in this industry are highly mobile, relocating to new areas based on job opportunities. Interactive Media skills are in high demand across the country, and skilled workers have free choice across a range of location options. Businesses recruit workers by leveraging a variety of factors, including workplace culture, wages and benefits, also touting the overall desirability and livability of the firm's location and the out-of-work amenities in the form of access to arts, entertainment, and recreation.

In tandem with each other and with economic options, these amenities lead to the Puget Sound region being a magnet for attracting and retaining top talent, oft cited as a highly desirable place to live. Seattle was rated in Top 10 places to live in 2013 by MSN Money, Bloomberg Businessweek, Forbes, The Business Journals, USAToday, and Greatist.

**Proximity to Nature**

The Puget Sound region's outdoorsy reputation is a function of the proximity to several different climates and topographies within short drives of the urban areas. Major employment and residential areas are close to oceans, lakes, and rivers for water

recreation such as sailing, canoeing, and kayaking, alpine mountains for climbing and winter recreation such as snowshoeing, skiing, and snowboarding, and expanses of forested or agricultural areas for biking, motorcycling, and hiking. The region's outdoor culture and widely regarded natural beauty facilitates and promotes recreational opportunities which increase the desirability of Seattle.

**Arts and entertainment**

The Seattle area is home to a nationally renowned arts and entertainment scene.  Cultural institutions such as the Seattle Symphony Orchestra, the Seattle Opera, the Pacific Northwest Ballet Company, exist alongside theater companies, live music venues, music and arts festivals, film festivals and cinemas, and award-winning restaurants and bars in a multitude of unique, walkable neighborhoods. Seattle is also home to professional football, baseball, women's basketball, and soccer teams as well as semi-professional teams, and leagues in a variety of sports throughout King County.

**Affordability**

Especially in housing, the Puget Sound's cost of living is notably lower than in many other west coast cities with technology-dependent economies. Other affordable cities with significant technology economies include Portland, Sacramento, and Los Angeles.

While Silicon Valley is the nation's technology hub, Seattle's advantage of relative affordability compared to California's Bay Area and Silicon Valley have contributed to Seattle's position as technology's second city. The May 2013 median price for a two-bedroom home in San Francisco is $880,000; in Seattle that figure is $385,000. Office rents are also more affordable compared to San Francisco, with lower annual rent growth rates.[25]

**Food Culture**

The region's creativity extends itself easily to the culinary arts, which in turn helps attract talent in technology and IM. As competition for workers increases, businesses market advantages like a great food culture to potential employees. Those in IM related occupations are paid well (**Exhibit 9**), and this workforce helps support the restaurants, coffee shops, and cafes that anchor neighborhood economies.

**Transit**

The ability to get easily to and from work is an important consideration for both the IM workforce and businesses who employ them. Congestion and inadequate public infrastructure has led some companies in metropolitan areas to provide private transportation services in an effort to transport employees to work. The ability to rely on a functional public transit system gives freedom to

businesses in where they locate, as well as to individuals in where they choose to live.

### Regional Talent Base

Workers in IM are drawn to Puget Sound's creative economy from all over the country. Training and education programs (listed in **Exhibit 16**) for IM related careers span the state, and range from general to specific technological skills needed for careers. In turn, this ready talent pool weighs heavily in locational decisions of startups as well as relocation and expansion decisions of existing businesses and spinoffs.

### Coworking Spaces

Coworking spaces allow for small businesses who might otherwise be unable to afford commercial rents and office supplies to pool resources in the provision of office space. Coworking is attractive to Interactive Media businesses and workers as they provide collaborative and flexible oftentimes with short term leases ideal for project-based teams.[26] Coworking spaces exist near areas with a large presence of Interactive Media and other technology-based businesses, including Kirkland and Pioneer Square,[27] South Lake Union[28], Fremont[29] and Capitol Hill.[30]

Red Element Collective is one such example of a coworking space that is collaborative and geared towards digital media. Graphic designers, video, and game producers inhabit the space, located in downtown Seattle. [31]

### Content and Device Proliferation

A proliferation of game consoles are now available to consumers. Large Interactive Media companies who previously focused on content distribution have introduced game consoles, and existing systems have released new models. Valve's Steam Machines are a line of PCs designed for gamers with various specifications and at various price points. Amazon, who recently purchased the California-based game developer studio Double Helix, is projected to release a game console in 2014[32]. Microsoft introduced the Xbox One in November 2013, selling 2 million units in the first two weeks.

Proliferation of other content-based devices such as smartphones, tablets, e-readers, and the emergence of wearable devices have carried IM platforms to a wider audience than ever before. Consumers now own on average three content-based technological devices. Personal fitness and wearable biometric devices are an emerging market, and in 2013 the tablet market experienced 177% year over year growth in device ownership.[33]

### Startups

Startup culture remains a strong and growing element in Interactive Media. Driven by young talent and industry veterans alike, startups enjoy access to

venture capital and other institutional support in the Puget Sound region.

The growing presence of coworking space, networking events, broadband infrastructure and workforce development efforts provide resources for these businesses and workers.

### Location Decisions

Companies in Interactive Media Cluster throughout the Puget Sound region. Driven by access to talent and clients, businesses have located in Bellevue, Redmond, Kirkland, Renton, and neighborhoods in Seattle including Pioneer Square, Fremont, South Lake Union, and downtown.

Location decision-making factors for IM businesses include a preference for open office layouts to facilitate collaboration, access to digital infrastructure, and a preference for neighborhoods considered desirable to workers.

IM companies with headquarters in other locations continue to expand and place satellite office in the region. Recent examples include GoDaddy in Kirkland,[34] Oculus VR in Seattle[35], SMART Technology in Seattle,[36] F5 in Bellevue[37]. Articles in trade media list 15 tech businesses with headquarters outside the region who have located in Seattle between 2010 and 2013[38]. Expansions include Google in Kirkland and Bothell[39] and Facebook and Twitter in downtown Seattle.[40]

### Workforce

Interactive Media draws from a workforce whose talents are highly transferrable throughout the technology sector. These mobile workers can select from a variety of businesses and regions when choosing where to locate.

Workplaces that are centrally located to walkable neighborhoods and transit connections are highly desirable. Though Puget Sound has an extensive multimodal public transit system linking regional and urban transit, some companies report dissatisfaction with the parking and transit options available.

Workers desire flexible work times, a variety of affordable housing options, and workplace amenities such as food, employee events, and the incorporation of creativity and fun into the workplace. Companies compete for talent in the type and nature of the work they offer, through wages and benefits, and through workforce culture and perks. Companies report that their biggest selling points to attract new employees include working environment, opportunity to join a startup, and the ability to work on innovative products.

In 2013 more MBA graduates from elite schools including Harvard and Stanford selected positions in the tech sector than in finance for the first time. In some cases these graduates accepted lower salaries than those offered in other sectors, preferring

instead the "fast paced" and "innovative" work often available in Interactive Media.[41]

Local educational institutions are expanding to accommodate growing demand from students for education and training in skills applicable to Interactive Media. The University of Washington is proposing to construct a new facility for the Paul G. Allen Center for Computer Science & Engineering. Department chair Hank Levy was quoted in *The Seattle Times*, saying "We need to grow our degree programs at all levels to meet the demand for computing education, both for our own majors and outside."[42]

The future workforce for IM is also diversifying. Women increasingly attend IM training programs in both the arts and in computer science. The percentage of women attending DigiPen Institute of

Technology has increased from 4 %in 2003 to 19% in 2013.[43]

Increasingly, contracting is a popular workforce practice for both large and small IM businesses, which is cheaper and more flexible for a company. Staffing agencies help run these businesses through contract workers, whose typical contract lasts one year. Assignments can often function as apprenticeships where workers gain technical skills needed to move up in the industry, and then gain full-time employment at the same job, or another. In games, as entire 3-D worlds are created, many artists are needed to render each object in the game, but when the project is over companies do not always retain that workforce.

### Venture Capital and Startup Incubators

- Microsoft's Kinect Accelerator was a three-month incubation program for startups which is run by Microsoft in conjunction with Techstars (a global startup accelerator). The program provides startups who have developed commercial applications using Microsoft's Kinect technology with technical and business support, seed money, and networking opportunities. Freak'n Genius is one company who began through the incubator. Other startups ranged from companies developing a monitoring service for senior citizens, to consumer tracking behavior in retail stores[44].

- WIN REACTOR is an Interactive Media specific startup accelerator that provides mentoring, advice on funding platforms and monetization strategy, business coaching, and access to publishing and distribution houses. Apptentive, Refract Studios, and Freak'n Genius were members of the first class, and Wire Labs, 8bitMMO, Cascade Game Foundry, Evolution Controllers, VRcade, and Litesprite are in WIN REACTOR's current class of startups.

- Angel Investors and venture capitalists such as Madrona Venture Group, G2 Investment Group, Ignition Partners, and Maveron are four of many local venture capital businesses serving technology and communications

startups. Investor Networks such as Alliance of Angels and Puget Sound Venture Club bring together many investors and those seeking funding to invest in local technology startups.

- Startup Seattle is part of Seattle's Office of Economic Development, and is a "collaborative effort between the City of Seattle and leaders of Seattle's technology startup community to develop a strategy for supporting early-stage technology companies, expand the number of startups, and firmly establish Seattle as an internationally recognized home for emerging technology companies". The initiative began in 2012 and programs include startup business services, expanding opportunities in technology through new partnerships, place making, and broadband infrastructure planning.

- Startup Weekend is a non-profit network of entrepreneurs headquartered in Seattle and sponsored by Google, but with organizers spread around the world. The model is a weekend of pitching, feedback, business model creation, coding, designing, and market validation. Weekends culminate with presentations in front of entrepreneurial leaders. Tens of thousands of alumni in countries around the world have participated in this model of technology innovation and entrepreneurship, and Seattle hosts several such events on an annual basis.

## Business Examples

The following businesses exemplify the range of activity related to Interactive Media in the Puget Sound region. Businesses range from large multinational corporations to startups with a handful of employees––included are game producer, publishers, and designers as well as content providers who use Interactive Media to market brands, raise awareness, and disseminate news and information.

- Microsoft Corporation is a Fortune 100 company with locations across the world. With 2013 revenues at $77 billion dollars, Microsoft is a global leader in software development, design, distribution, and licensing. Their host of products and services continues to expand into Interactive Media related divisions. Devices include the Windows Phone, the Microsoft Surface tablet, the family of Xbox game consoles, and the Kinect. Microsoft Game Studios develops the Halo, Age of Empires, Fable, Gears of War, and Zoo Tycoon game series, among hundreds of other games for handheld devices, tablets, and desktop and laptop computers. Microsoft Studios contains 28 studios worldwide, 24 for game development, and six for entertainment technology advancement and publishing. Microsoft has

approximately 40,000 employees in Washington. [45]

- Bungie Studios is a game developer originally based out of Chicago, where they released Operation: Desert Storm, and Minotaur: The Labyrinths of Crete. The company moved to Seattle where they were acquired by Microsoft in 2000, where they developed the HALO franchise. In 2007, Bungie became independent from Microsoft once again. They have a forthcoming title, Destiny, set to be released in September of 2014. Bungie employs 350 people and are headquartered in Bellevue.

- PopCap is a casual game developer and publisher based in Seattle. Acquired in 2011, it is now a subsidiary of Electronic Arts. Founded in 2000, PopCap's most popular game is Bejewled, a matching game for various platforms which has sold 50 million units. PopCap games are available for Web, PC and Mac, handheld game devices, consoles, cell phones, tablets, and other mobile devices. The game company uses the "Freemium" model, where many games are available to play in a limited form for free, with more robust version available for purchase.

- Valve Corporation is a video game developer and digital rights distribution company based in Bellevue. Valve produces several lines of

popular games including all games associated with Counter-Strike, Half-Life, Left 4 Dead, and the Portal series. Steam, a popular Valve product, is a digital distribution, rights management, multiplayer and communications platform used to distribute games and other media online, including content from independent developers and larger software houses. In 2012 Steam expanded to include non-gaming software and now offers close to 2,000 games to over 54 million accounts. The company employs approximately 300.

- Big Fish Games is a game developer, licenser, and distributor focusing on casual games for download, mobile and online browser play. Big Fish Games distributes a large volume of games, with over 2,500 games in their catalog, they serve 1.5 million downloads per day. They operate several monetization models including free-to-pay, try-before-you-buy, pay-for-premium, and monthly subscriptions. In 2013, Big Fish Games had 700 employees.

- Zumobi is a mobile media and advertising company that develops apps for smartphone, tablets and other devices. Zumobi's clients include American Express, Boeing, JC Penny, Johnson & Johnson, Mercedes, and Starbucks. They work with media companies such as NBC to develop apps and mobile sites to

disseminate content and news, integrated with in-app advertising. Zumobi is headquartered in Seattle, with locations in New York and Chicago. The company employs approximately 100 people.

- LiteSprite is a startup in the second class of businesses with membership at the WIN REACTOR accelerator. LiteSprite aims to use games at the intersection between medicine and technology, helping people overcome medical issues. The first game targets women ages 25-to-40 struggling with anxiety and depression. As players navigate the game their progress is tracked, rewarded and monitored by clinicians and caregivers to help customize treatment plans, integrating game play and a player's course of treatment. Litesprite is one of five finalists for the Robert Wood Johnson Foundation Games to Generate Data Challenge. The company has ten employees.

- WireLabs is a startup in the second class at WIN REACTOR. The company has developed a mobile messaging application called Wire with photo and video messaging features, and aimed at teen audiences. The company has raised $1.8 million in two rounds of funding for the app from Vulcan Capital and other investors represented by Zillow, Expedia, and Facebook. [46]

- Amazon is a newcomer to the gaming industry in the last few years, by both hiring talent from other games such as Valve's Portal, as well as by acquiring smaller studios.[47] Sev Zero is Amazon's first exclusive game, a hybrid shooter/tower defense experience for the Amazon Fire streaming media player.
- Freak'n Genius is a startup founded in 2011 as an inaugural member of the 2012 Microsoft Kinect Accelerator program, as well as WIN REACTOR. The company created a popular free mobile app called YAKiT which allows users to manipulate the mouths of family, friends, and animals, and create animations from these. The app also has messaging and social capabilities. The firm recently raised another $275,000 from Windforce Ventures, and has six employees at its headquarters in Seattle.[48]

# INDUSTRY PERSPECTIVES AND TRENDS

This section of the report establishes recent trends and perspectives from industry leaders in IM. Industry stakeholders were engaged and a literature review was performed to enrich the analysis and to provide context for industry trends. Findings are grouped by key themes for Interactive Media businesses, talent, and infrastructure.

## Industry Trends

- **The core business model is changing**. While the "traditional" model of a company producing content and launching a new system every 3-5 years still exists, a multitude of distribution channels now exist for developers to get their product to their customers. Developers no longer have to rely on established publishers; developers create content for a multitude of platforms, as well as selling products directly to consumers. Additionally, unity scripting language has begun to allow developers to create content across multiple platforms more easily than in the past.

- **Purchase up front is declining**. At the same time, most game developers are moving away from the "traditional" game model of a single purchase up front to a model where cost to play is reduced up front to either a nominal sum or for free, while continual interaction with the game allows a player to unlock certain features throughout the life of the game. Of the seven game developers contacted for this study, four mentioned this as a major trend in gaming.

- **Cloud Computing is a competitive advantage.** Cloud computing is one area of specialization in Washington's technology cluster. Infrastructure such as server farms and data centers combined with companies who specialize in cloud services (e.g. Amazon Web Services and Microsoft Azure) underpin this focus.

- **User generated content is powerful.** In gaming and applications, user generated content can be utilized to employ a personalized user experience or for more targeted marketing, in real time.

- **Consumers are moving to mobile and tablet.** Increased processing power and portability have given rise to games on mobile devices and tablets, rather than the "traditional" desktop PC. Of the seven game developers contacted for this study, four spoke to the movement to mobile gaming as a trend. Still, the volatility of the causal gaming market combined with the established nature of those segments means the market for console and PC gaming is still strong.

- **Funding is easier *and* more difficult than in the past.** While crowd funding has democratized funding structures to the benefit of less established developers and startups, reduced barriers to entry have increased competition, making it more difficult to stand out. Risk in in the casual gaming/apps market (where a few companies are very successful but the majority are not) has made it more difficult to garner funding from established sources.

- **Talent is everything.** From established, large game companies to single entrepreneurs, IM employers have a hard time finding talent at a price they can afford to pay. Occupations which are the most difficult to hire for include engineers/developers, designers, and business development/marketers. Business requirements regarding infrastructure also revolve around employee needs, ranging from more affordable housing to access to efficient transportation options.

- **Education is paramount.** Rigorous STEM education and curriculum is the key to training Washington's IM workforce, and rising tuition and capacity issues are a barrier to entry. Educational leaders argue that primary and secondary education in Washington does not adequately prepare students for skills in science, technology, engineering, and mathematics (STEM) curriculum for the innovative and technically challenging jobs in the ICT cluster.[49]

- **Washington must continue to innovate.** From training and education, to professional development and funding networks, Washington's IM cluster must continue to innovate to remain relevant and competitive with other regions.

# MEASURES AND IMPACTS

## Businesses & Jobs

The total number of Interactive Media businesses has increased 120% (a Compound Annual Growth Rate of 14%) from 2007, when there were approximately 150 (**Exhibit 3**). In 2013, there are over 330 businesses in the Cluster (**Exhibit 3**).
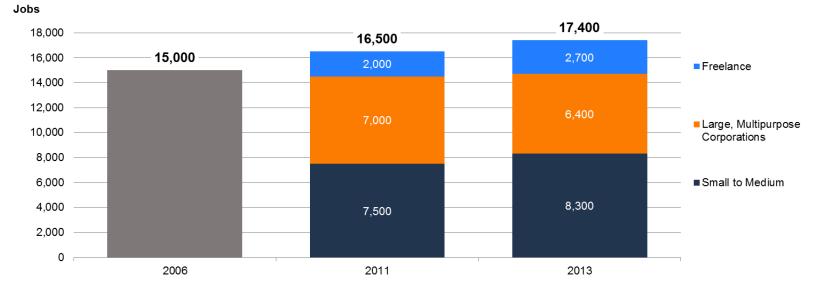
**Exhibit 3. Interactive Media Businesses, Medium to Small Sized Interactive Media Companies, Washington State, 2007 – 2013**

| Year | 2007 | 2012 | 2013 | CAGR 2007-2013 | 2007-2013 % Change |
|------|------|------|------|------|------|
| Number of Companies | 150 | 304 | 330 | 14% | 120% |

*Source: Washington Interactive Network list of known IM companies in Washington, 2013; Community Attributes, 2013*

Total statewide Interactive Media employment, including the self-employed, small and medium-sized firms, and in large firms such as Microsoft's IM-related activities, summed to 17,400 workers, representing a 6.1% year-over-year increase (**Exhibit 4**). Microsoft's IM activities are estimated to have employed 5,500 workers in 2013, while the self-employed—representing many start-up activities—reached nearly 2,700 workers.[1]

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[1] Microsoft employment activities are lower than those reported in previous versions of this study. This is due to an alternative method for estimating Microsoft interactive media-related employment. In past studies, the Microsoft total was obtained through interviews with Microsoft employees, whereas in this analysis estimates are based on a combination of financial statements, company employment across the region, and output-to-worker ratios for software publishing reported in the transactions table of the 2007 Washington State Input-Output Model, with adjustments for inflation.
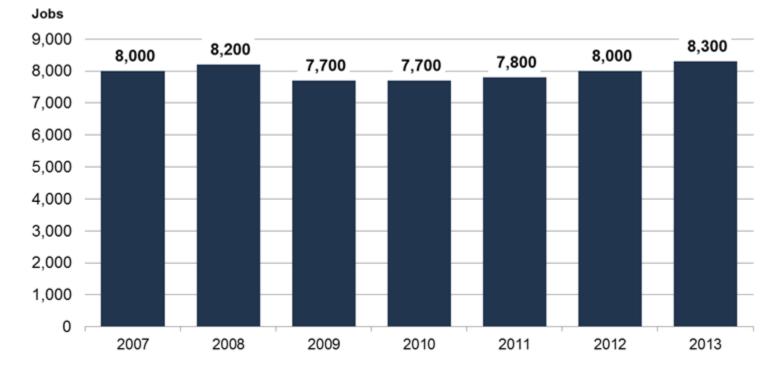
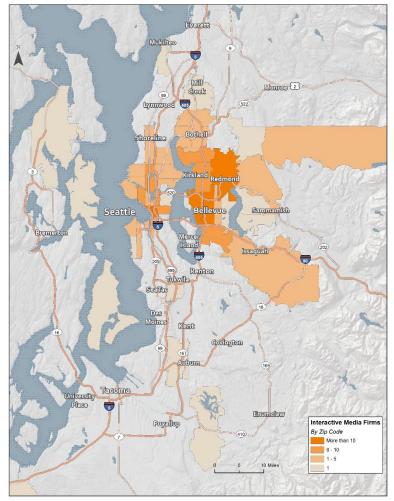## Exhibit 4. Interactive Media Jobs, 2006, 2011, and 2013

**Jobs**



*Source: Washington Interactive Network list of known IM companies in Washington, 2013; Washington State Employment Security Department, 2014; Microsoft Corporation, 2014; Washington State Office of Financial Management, 2013; Community Attributes, 2014. Note: Employment is based on Washington Interactive Network list of known IM companies in Washington, and scaled up by 10% to account for firms who are excluded from the list.*

Based on the above method, Microsoft's interactive media employment actually increased 6.8% year-over-year in 2013, though it remains 8.1% below a 2011 peak in interactive media employment of more than 5,900 workers.

## Exhibit 5. Estimated IM Employment, Medium to Small Sized Interactive Media Companies, Washington State 2007-2013



*Source: Washington Interactive Network list of known IM companies in Washington, 2013; Washington State Employment Security Department, 2014; Community Attributes, 2014. Note: Employment is based on Washington Interactive Network list of known IM companies in Washington, and scaled up by 10% to account for firms who are excluded from the list.*

In 2013, Interactive Media employment for medium to small sized companies exceeded pre-recession levels, reaching an estimated 8,300 workers across the state (**Exhibit 5**). Employment declined from 8,200 workers in 2008, at the cusp of the recession, to 7,700 in 2009 and 2010 before rebounding between 2011 and 2013.

While the majority of the businesses are concentrated in the Puget Sound region, with heavy concentrations in downtown Seattle, Bellevue, and

Redmond, clusters of businesses operate statewide, including in Spokane, Tacoma, and Vancouver. Microsoft, Nintendo, Amazon, Real Networks, and Google Play serve as significant IM-related employment anchors in the region.

A recent trend has companies headquartered outside of Washington placing satellite offices in Seattle in order to boost presence. In 2011, social game maker Zynga located in Pioneer Square, and

Facebook located in downtown Seattle. Notably, although Zynga has experienced financial issues since the 2012 version of this study, they have closed offices in New York and Los Angeles citing financial reasons, but they do not plan to close their Seattle office.[50] Recently, Twitter signed a lease for a 16,000 square foot office space in downtown Seattle.[51] **Exhibit 6** maps Interactive Media firm locations in the Puget Sound region.

## Exhibit 6. Map of Firm Locations, Puget Sound, 2012



*Source: Washington State Department of Revenue, 2013; Washington Interactive Network list of known IM companies in Washington, 2013 Community Attributes, 2013.*

## Revenues

Total Interactive Media revenues in Washington in 2013 are estimated to be $19.2 billion. These revenues are further disaggregated below by size of company.

**Exhibit 7** shows revenues among small and medium-sized Interactive Media firms from 2008 to 2013. Between 2009 and 2010, revenues declined from $9.7 billion to $8.0 billion before rebounding the next three consecutive years and reaching an estimated $9.6 billion in 2013.[2]

**Exhibit 8** shows revenues for Microsoft's Entertainment and Devices Division from 2008 to 2013, adjusted to reflect calendar year totals (based on fiscal year reporting). This division of Microsoft includes Xbox, Xbox Live, Windows Phone 8, and Skype (acquired in 2011). While revenues declined

from 2008 to 2009, the revenue increased from 2009 to 2011 before a slight decline in 2012.[3]

In 2013, Microsoft reorganized its divisions, with entertainment division replaced by two new segments, "Devices and Consumer Hardware" and "Devices and Consumer Hardware, Other." These new units include Xbox and related activities, but may also include additional activities and products previously housed in other segments and reported separately in previous financial statements, explaining the sharp increase in revenues from 2012 to 2013. The entire division reported sales of $15.4 billion, but includes some activities not directly tied to Interactive Media. After adjusting for this, MS Interactive Media revenues for 2013 are estimated to be $9.7 billion.

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[2] Based on interviews with stakeholders and the Washington State Department of Revenue, the decline may also reflect a change in Washington State tax collection policy. In 2010, many digital products that were taxed as "services" were reclassified as retail goods and thus subject to a lower tax rate. Companies that sell digital products over the internet could apportion revenues outside Washington, which may reduce Interactive Media revenues (GBI) attributed to Washington

State. Over this same period (2010-2011), employment actually increased, suggesting this change in tax policy may be the largest factor explaining this decline in GBI.
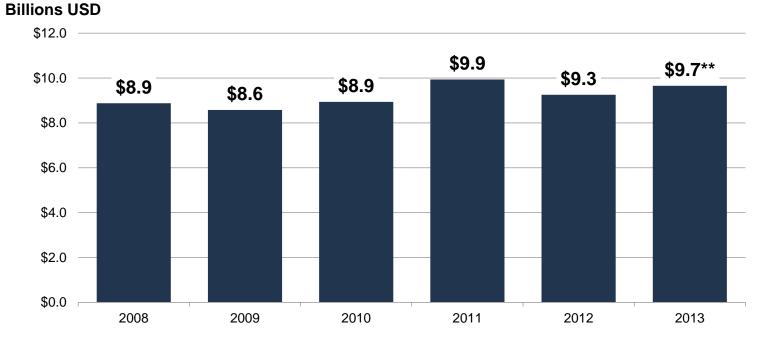
[3] Calendar year totals are estimated based on fiscal year totals as reported by Microsoft.

**Exhibit 7. Gross Business Income among Medium to Small Sized Interactive Media Companies, Washington State 2008-2013 (2013 $)**

**Billions USD**



*Source: Washington State Department of Revenue, 2013; Community Attributes, 2013.*

## Exhibit 8. Microsoft Interactive Media Revenues, 2008-2013 (2013 $)*

**Billions USD**



*Totals are adjusted to calendar year estimates, based on fiscal year financial statements from Microsoft (July 1 through June 30)
**In fiscal year 2014, the Entertainment and Devices division was replaced with "Devices and Consumer Hardware" and "Devices and Consumer Hardware, Other." These two new segments include Xbox and related activities, but may also include additional activities and products previously housed in other segments and reported separately in previous financial statements. To adjust for this change, the calendar year total for 2013 is based on the growth rate between fiscal year 2012 and fiscal 2013, the latter based on the last 6 months of 2012 and first 6 months of 2013.
Source: Microsoft Corporation, various years; U.S. Bureau of Economic Analysis, 2014; Community Attributes, 2014.*

## Occupations, Industries, and Wages

This section of the report establishes key occupations in the IM Cluster, wages associated with that occupation, and relative comparisons of Seattle to other regions for these occupations. This section first reports occupation aggregated to include all IM jobs in occupations suitable for the Cluster. Then, the report examines key occupations in the Cluster such as multimedia artists and animators, as well jobs in a key industry in the Cluster, such as software publishing.

### Exhibit 9. Top Ten IM Jobs Ranking Per Capita, Total Jobs in IM Occupations, 2012

| Per Capita Ranking | City | Total IM Jobs in Occupation |
|---|---|---|
| 1 | Washington DC | 176,300 |
| 2 | Boston | 109,300 |
| 3 | Atlanta | 71,800 |
| **4** | **Seattle** | **97,730** |
| 5 | San Francisco | 88,900 |
| 6 | San Jose | 84,600 |
| 7 | Chicago | 107,100 |
| 8 | Dallas | 96,700 |
| 9 | New York | 208,100 |
| 10 | Los Angeles | 125,900 |

*Source: U.S. Bureau of Labor Statistics, 2013; Community Attributes, 2013.*

**Exhibit 9** shows the top metropolitan statistical areas (MSA) for employment of Interactive Media Occupations (below in **Exhibit 10**), by per capita ranking. Seattle's MSA, including King, Snohomish, and Pierce counties, had nearly 98,000 workers in occupations related to Interactive Media pro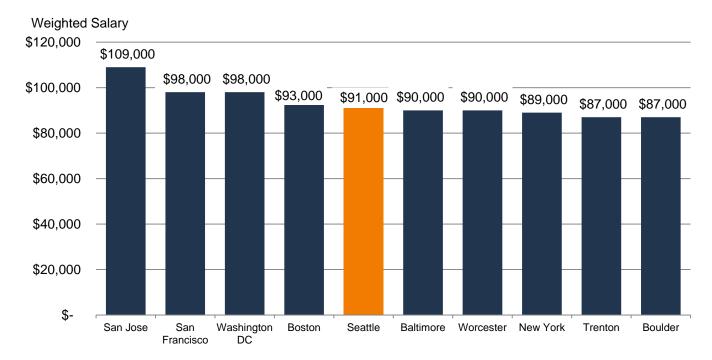duction in 2012, below San Francisco and San Jose in terms of number of employees. Per capita, Seattle has the fourth highest number of in IM occupations, and is ranked above both San Jose and San Francisco. Washington DC has a large concentration of software and systems analysts, accounting for its spot. Boston and Atlanta are both gaming hubs, with Atlanta home to Turner Broadcasting.

## Exhibit 10. Interactive Media Occupations Jobs and Wages in Puget Sound Region, Ranked by Jobs in Occupation, 2012

| | Jobs in Occupation | Annual Median Wages | Top 10% Wages |
|---|---|---|---|
| Software Developers, Applications | 36,300 | $ 102,020 | $ 142,170 |
| Software Developers, Systems Software | 13,670 | $ 98,780 | $ 149,470 |
| Computer Programmers | 11,270 | $ 95,090 | $ 133,940 |
| Computer Systems Analysts | 10,950 | $ 91,910 | $ 135,740 |
| Computer User Support Specialists | 10,340 | $ 52,180 | $ 90,260 |
| Network and Computer Systems Administrators | 5,700 | $ 77,710 | $ 115,060 |
| Computer Occupations, All Other | 4,530 | $ 87,600 | $ 139,110 |
| Multimedia Artists and Animators | 2,360 | $ 63,780 | $ 109,800 |
| Database Administrators | 2,250 | $ 89,370 | $ 122,790 |
| Computer and Information Research Scientists | 360 | $ 103,040 | $ 153,640 |
| **Total** | **97,730** | | |

*Source: U.S. Bureau of Labor Statistics, 2012; Community Attributes, 2013. All data are for Seattle-Tacoma-Bellevue, WA MSA except jobs in Software Developers, Systems Software, which is not released at that geography. This reports employment for Seattle-Bellevue-Everett, WA Metropolitan Division for that occupation instead.*

**Exhibit 10** shows occupations related to Interactive Media production in the Puget Sound Region, ranked by number of jobs in the occupation, along with the median and top 10% annual wage associated with that occupation. Software developers account for over half of the occupational employment in the region, with a combined total of nearly 50,000 jobs. Both of those occupations are paid high wages ($102,020 for Applications Software Developers, and $98,780 for Systems Software Developers). Computer and Information Research Scientists earn the highest annual median wage in the Cluster at $103,040. All the occupations with the exception of Computer User Support Specialists pay higher than the Washington State median income of $56,444 in 2012, with the average weighted wage of all occupations ($91,000; see **Exhibit 11**) being 62% higher than Washington's State median income.
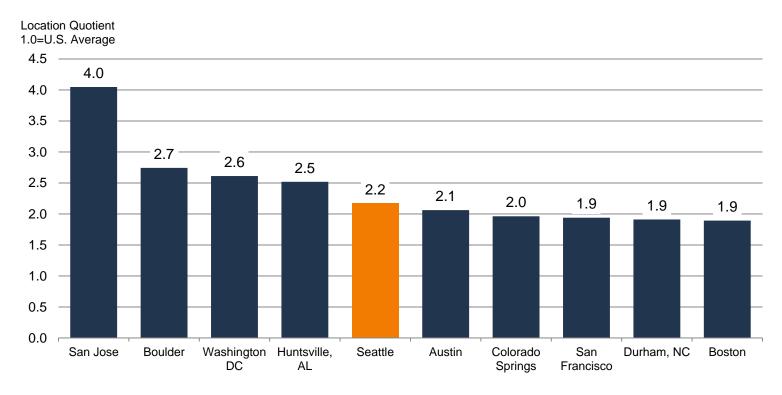
## Exhibit 11. Top Ten Highest Wages, All Interactive Media Occupations, 2012

Weighted Salary



Source: U.S. Bureau of Labor Statistics; Community Attributes, 2013.  Wage is based on a weighted estimate, inclusive of all occupations listed in Exhibit 9.

**Exhibit 10** shows weighted wage by Metropolitan Statistical Area for all IM occupations, ranked by top wage. Four MSAs have a higher combined salary for these occupations than Seattle, all with notably higher costs of living than Seattle.

## Exhibit 12. All Interactive Media Occupations, Top 10 MSA, 2012, Relative Concentration

Location Quotient
1.0=U.S. Average



Source: BLS, Community Attributes, Inc., 2013.

**Exhibit 12** displays relative concentration of all IM related occupations, ranked by the top ten Metropolitan Statistical Areas. This is measured by Location Quotient, which is a calculated ratio between a local economy and a reference 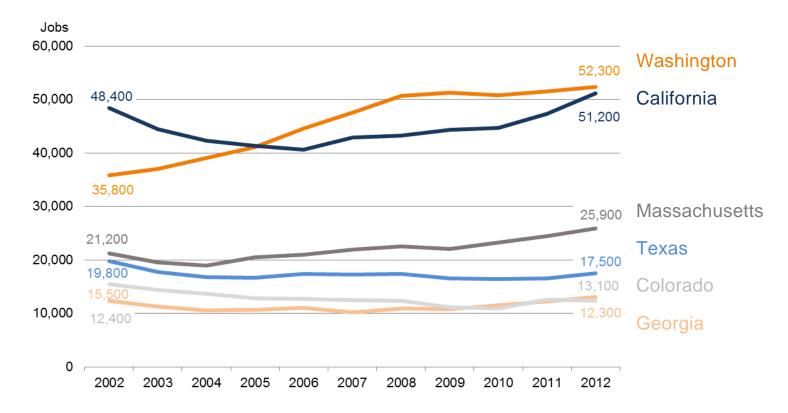economy. The U.S. concentration equals 1.0; any figure above that demonstrates a specialization of the industry in the local economy. Four MSAs have higher concentrations of these occupations. Seattle's location quotient of 2.2 can be interpreted by saying that it has 2.2 times more IM occupations than the U.S. as a whole.

**Exhibit 13** shows the relative and total concentration of the occupation of multimedia artists and animators, ranked by the Top 5 MSAs. With a location quotient of 6.3, Seattle is ranked higher than any other market for the occupation of multimedia artists and animators, despite that in number, Los Angeles and New York have more multimedia artists and animators.

### Exhibit 13. Multimedia Artists and Animators, Top Five MSAs, 2012 Occupation Totals and Relative Concentration (Location Quotient)



Source: BLS, 2013; Community Attributes, 2013.

## Exhibit 14. Top States for Employment of Software Publishers, 2002 – 2012



Jobs

| Value | State |
|-------|-------|
| 52,300 | Washington |
| 51,200 | California |
| 25,900 | Massachusetts |
| 17,500 | Texas |
| 13,100 | Colorado |
| 12,300 | Georgia |

Starting values (2002): 48,400 (California); 35,800 (Washington); 21,200 (Massachusetts); 19,800 (Texas); 15,500 (Colorado); 12,400 (Georgia)

*Source: BLS, 2012; Community Attributes, 2013.*

**Exhibit 14** analyzes the industry code for Software Publishers (NAICS code 511210) from 2002 to 2012. This is a key industry which underpins Washington's competitive advantages in IM as compared to other states. From 2002 to 2012, jobs in Washington's Software Publishing industry increased 46%, and beginning as early as 2005, Washington led the country in employment of this industry.

## Regional Impact

The full economic impact of the Interactive Media Cluster extends beyond jobs and revenues created directly by its member companies. Local suppliers to these activities benefit from increased business-to-business sales, and consumer industries throughout the area benefit from the household purchases made by its employees.

The IMPLAN Input-Output model for Washington, built on detailed information about the spending patterns of businesses and consumers, quantifies these linkages and calculates an estimate of the broader economic impact on the State. The model accepts the input of direct revenues and applies industry-specific multipliers to generate total

economic impact metrics of employment, labor income, and revenue. **Exhibit 15** shows the model results, with updated impacts reflecting new data and the inclusion of firms of all sizes (including Microsoft Interactive Media-related activities) for activities in the Puget Sound region.

The IMPLAN model results suggest that the Interactive Media Cluster supports, directly or through vendor sales and wages, at least 76,200 jobs. The total revenue impact associated with these direct activities sums to $36.3 billion, while at least $6.1 billion labor income is supported by the Cluster statewide.

**Exhibit 15. Estimated Statewide Economic Impact of Regional Interactive Media Economic Activity, 2013**

|  | Total Revenues ($ millions) | Total Jobs | Total Labor Income ($ millions) |
|---|---|---|---|
| Total Economic Impacts | 36,300 | 76,200 | 6,100 |

*Source: Minnesota IMPLAN Group, Inc., 2011; Community Attributes, 2014.*

# INDUSTRY WORKFORCE ASSESSMENT

## Education and Training

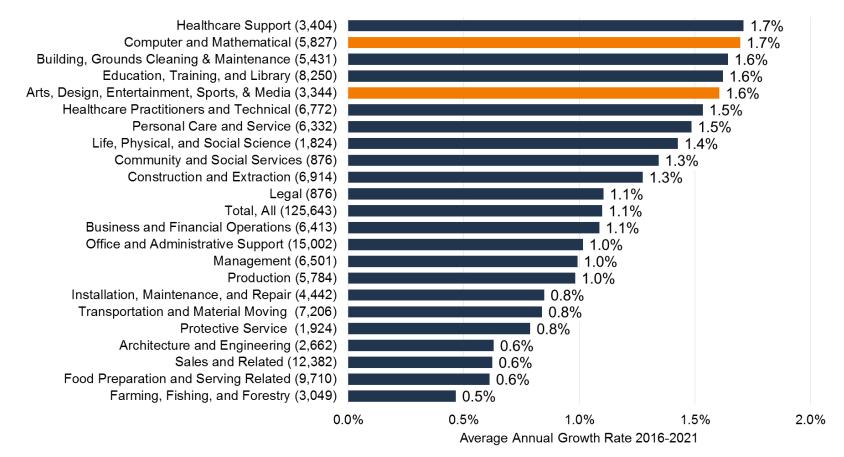**Exhibit 16** shows the many training programs available for Interactive Media training at accredited institutions across Washington. Coursework relevant to IM is wide-ranging and interdisciplinary, and ranges from fine arts, design, and user/interface design, to computer science and engineering.

### Exhibit 16. Selected Educational Institutions with Interactive Media Programs and Research in Washington, 2013

| Institution | Relevant Programs & Research |
| --- | --- |
| DigiPen Institute of Technology | Bachelor of Science in Computer Science: Real-Time Interactive Simulation, Game Design<br>Bachelor of Arts: Game Design<br>Master of Fine Arts: Digital Arts |
| University of Washington | Bachelor of Arts, Interactive Media Design (Bothell)<br>Bachelor of Science: Computer Science, Computer Engineering<br>Center for Game Science |
| Academy of Interactive Entertainment | Game Art & Entertainment<br>Game Programming |
| Washington State University | Bachelor of Fine Arts: Digital Media<br>Bachelor of Science and Arts in Computer Science; Computer Engineering<br>Master of Computer Science |
| Art Institute of Seattle | Associate of Applied Arts: Web Design & Interactive Media<br>Bachelor of Fine Arts: Game Art & Design, Media Arts & Animation<br>Bachelor of Science: Visual Effects & Motion Graphics<br>Web Design & Interactive Communications Diploma |
| Lake Washington Institute of Technology | Associate of Applied Technology: Digital Gaming and Media, Multimedia Design & Production |

*Source: Community Attributes, 2013.*

## Exhibit 17. Predicted Annual Growth Rate by Occupational Grouping (Total Openings Statewide in Parentheses): Washington State 2016-2021
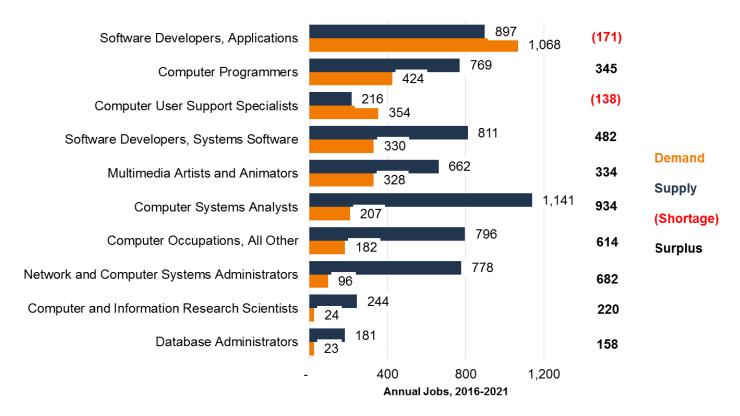
| Occupational Grouping | Average Annual Growth Rate 2016-2021 |
|---|---|
| Healthcare Support (3,404) | 1.7% |
| Computer and Mathematical (5,827) | 1.7% |
| Building, Grounds Cleaning & Maintenance (5,431) | 1.6% |
| Education, Training, and Library (8,250) | 1.6% |
| Arts, Design, Entertainment, Sports, & Media (3,344) | 1.6% |
| Healthcare Practitioners and Technical (6,772) | 1.5% |
| Personal Care and Service (6,332) | 1.5% |
| Life, Physical, and Social Science (1,824) | 1.4% |
| Community and Social Services (876) | 1.3% |
| Construction and Extraction (6,914) | 1.3% |
| Legal (876) | 1.1% |
| Total, All (125,643) | 1.1% |
| Business and Financial Operations (6,413) | 1.1% |
| Office and Administrative Support (15,002) | 1.0% |
| Management (6,501) | 1.0% |
| Production (5,784) | 1.0% |
| Installation, Maintenance, and Repair (4,442) | 0.8% |
| Transportation and Material Moving (7,206) | 0.8% |
| Protective Service (1,924) | 0.8% |
| Architecture and Engineering (2,662) | 0.6% |
| Sales and Related (12,382) | 0.6% |
| Food Preparation and Serving Related (9,710) | 0.6% |
| Farming, Fishing, and Forestry (3,049) | 0.5% |

*Source: Washington State Employment Security Department, 2012; Community Attributes, 2014. Sorted by Demand.*

Washington's Employment Security Department forecasts that occupations aligned with IM (Computer and Mathematical and Arts, Design, and Media occupations) will be some of the fastest growing between 2016 and 2021, with 1.7% and 1.6% growth respectively, compared with 1.1% growth for all occupations **(Exhibit 17)**.

Exhibit 18 compares the local supply of workers available with the demand for workers predicted for each occupation by WA ESD. The model defines supply as unemployment claimants (continued claims) plus annual completions from accredited higher education programs associated with IM occupations. It captures demand as average annual openings as reported in the ESD occupation forecast for Washington state. For this study, the model includes occupations in the Interactive Media Cluster throughout Washington State. See **Appendix D** for more information on the methods and assumptions in the model.

### Exhibit 18. Estimated Annual Supply and Demand for IM Occupations, Washington State 2016-2021



| Occupation | Supply | Demand | Surplus/(Shortage) |
|---|---|---|---|
| Software Developers, Applications | 897 | 1,068 | (171) |
| Computer Programmers | 769 | 424 | 345 |
| Computer User Support Specialists | 216 | 354 | (138) |
| Software Developers, Systems Software | 811 | 330 | 482 |
| Multimedia Artists and Animators | 662 | 328 | 334 |
| Computer Systems Analysts | 1,141 | 207 | 934 |
| Computer Occupations, All Other | 796 | 182 | 614 |
| Network and Computer Systems Administrators | 778 | 96 | 682 |
| Computer and Information Research Scientists | 244 | 24 | 220 |
| Database Administrators | 181 | 23 | 158 |

Annual Jobs, 2016-2021

Demand

Supply

(Shortage)

Surplus

For 2016-2021 in Washington, most IM occupations are predicted to have a surplus of workers to serve IM companies. However, Applications Software Developers and Computer User Support Specialists are predicted to have a shortage of 171 and 138 workers annually between 2016 and 2021. The largest surpluses are predicted for Computer Systems Analysts (with a surplus of 934 annually), Network and Computer Systems Administrators (with a surplus of 682 annually), and Systems Software Developers (with a surplus of 482 annually).

It is important to note that while this model identifies a potential surplus for occupations related to IM, the surplus is based on graduates and unemployed claimants who may not have competitive skills necessary to attain a job in IM. This assessment serves to compare the number of local available workers with the forecasted openings between 2016 and 2021, but cannot assess the competitiveness of candidates who are available for the local job market.

**Exhibit 19** disaggregates the number of graduates by major in order to understand what programs are graduating potential workers in IM. The major or program which graduates the most potential workers in IM is that of Web Page, Digital/Multimedia and Information Resources Design. The two single largest sources of graduates in Web Page, Digital/Multimedia and Information Resources Design are Peninsula College in Port Angeles (186 graduates in 2012) and Edmonds Community College (108 graduates in 2012).

Education is a vital pathway to the IM workforce. The IM sector can be supported in years to come by ensuring alignment between higher education institutions with employers' needs for both arts and engineering graduates.

## Exhibit 19. Washington State Graduates by Major Suitable for IM, 2012

| Graduates by Major (CIP) | Graduates |
| --- | --- |
| Web Page, Digital/Multimedia and Information Resources Design. | 1,075 |
| Computer and Information Sciences, General. | 439 |
| Graphic Design. | 381 |
| Computer Science. | 244 |
| Computer and Information Systems Security/Information Assurance. | 198 |
| Animation, Interactive Technology, Video Graphics and Special Effects. | 139 |
| Computer Programming/Programmer, General. | 113 |
| Computer Engineering, General. | 82 |
| Information Technology. | 61 |
| Digital Arts. | 43 |
| Data Processing and Data Processing Technology/Technician. | 29 |
| Computer Support Specialist. | 23 |
| Computer Programming, Specific Applications. | 22 |
| Computer Graphics. | 21 |
| Computer Software Engineering. | 11 |
| Information Science/Studies. | 8 |
| Data Modeling/Warehousing and Database Administration. | 3 |
| Computer Programming, Vendor/Product Certification. | 2 |
| Mathematics and Computer Science. | 1 |

*Source: IPEDS, 2012; Community Attributes, 2014.*

# APPENDICES

## Appendix A. Industry (NAICS) Codes

The following five-digit NAICS (Industry) codes were used to define the Interactive Media industry. These codes were used in the talent pipeline to allocate occupations to the Interactive Media industry.

**Exhibit A. List of NAICS Codes Included in Interactive Media Definition**

| NAICS | Category Name |
|---|---|
| 33451 | Navigational, Measuring, Electromedical, and Control Instruments Manufacturing |
| 33993 | Doll, Toy, and Game Manufacturing |
| 51112 | Periodical Publishers |
| 51121 | Software Publishers |
| 51219 | Postproduction Services and Other Motion Picture and Video Industries |
| 51224 | Sound Recording Studios |
| 51821 | Data Processing, Hosting, and Related Services |
| 51913 | Internet Publishing and Broadcasting and Web Search Portals |
| 54143 | Graphic Design Services |
| 54151 | Computer Systems Design and Related Services |
| 54171 | Research and Development in the Physical, Engineering, and Life Sciences |
| 54181 | Advertising Agencies |
| 56131 | Employment Placement Agencies and Executive Search Services |

*Source: ESD, 2012; Community Attributes, 2013.*

## Appendix B. Occupational (SOC) Codes

The following five-digit SOC (Occupational) codes were used to define the Interactive Media industry. These codes were used in the talent pipeline to allocate occupations to the Interactive Media industry.

### Exhibit B. List of SOC Codes Included in Interactive Media Definition

| SOC Code | Occupation |
| --- | --- |
| 15-1132 | Software Developers, Applications |
| 15-1131 | Computer Programmers |
| 15-1121 | Computer Systems Analysts |
| 15-1142 | Network and Computer Systems Administrators |
| 15-1199 | Computer Occupations, All Other |
| 27-1014 | Multimedia Artists and Animators |
| 15-1141 | Database Administrators |
| 15-1111 | Computer and Information Research Scientists |
| 15-1133 | Software Developers, Systems Software |
| 15-1150 | Computer Support Specialists |
| 15-1151 | Computer User Support Specialists |

Source: BLS, 2012; Community Attributes, 2013.

## Appendix C. Stakeholders

The following people and businesses were engaged as part of this process to provide general perspectives on the prospects for this growing industry and their experiences located in the Puget Sound Region. Interviews were conducted online and over the phone.

*Accelerated Pictures*

*Microsoft Studios*

*Lewis McMurran*

*Digipen Institute of Technology*

*VRcade*

*Myron McMillin*

*Freak'n Genius*

*Big Fish Games*

*Valve*

*Facebook*

## Appendix D. Workforce Supply and Demand Assumptions

Both supply and demand data are allocated to IM by dividing the number employed in the industry by total employment industry wide. Data for unemployment claims are from continued October 2013 claims, and data for educational completions are IPEDS completions for 2012. Before arriving at a final estimate for supply, educational completions are mapped to demand for occupational openings, and unemployment claims are adjusted for projected unemployment levels for 2016-2021 (5.3%, based on unemployment forecasts by local economists). Educational completions are not forecasted. Instead, this model assumes the static number of completions for 2012 as a yearly average.

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