



SOFTWARE / IT

2016

THE COLUMBIA-WILLAMETTE WORKFORCE COLLABORATIVE

Working together to support and develop regional talent.



ABOUT THE COLUMBIA-WILLAMETTE WORKFORCE COLLABORATIVE

The Columbia-Willamette Workforce Collaborative (Collaborative) is a partnership between the Clackamas Workforce Partnership, Workforce Southwest Washington (formerly the Southwest Washington Workforce Development Council) and Worksystems: the three Workforce Development Boards covering the Portland-Vancouver Metropolitan Area. The Collaborative delivers a unified approach to serving industry, supporting economic development, and guiding public workforce training investments to better address the needs of our combined labor shed.

We know that people are willing to travel throughout the region for the best opportunities and that employers need the most qualified workers regardless of where they live. By working together, we can cultivate our regional talent pool and build the foundation for a strong economy.

ABOUT THIS REPORT

The Collaborative is focused on aligning and investing resources to support the workforce needs of four sectors: Advanced Manufacturing, Health Care, Software/IT, and Construction. Sectors are chosen based on factors such as their economic significance to the region, current number of openings and job growth projections, average wages that support self-sufficiency, and career ladder opportunities across the skill continuum. By examining labor market intelligence (such as the data contained in this report) and vetting the information with business partners, we are able to better understand industry trends, identify current and emergent workforce needs, and develop customized solutions for each sector.

ACKNOWLEDGEMENTS

Much of the data in this report was provided by the Oregon Employment Department and the Washington Employment Security Department, key partners in the region's workforce development system. The Collaborative is dedicated to assuring this information is regularly updated and presented in a way that advances the region's capacity to understand and align regional workforce supply with business demand in key industry sectors.

OVERVIEW

With 23,400 jobs and a payroll of \$2.3 billion, Software/Information Technology (IT) accounts for 2.3 percent of the greater Portland region's private-sector employment and 4.5 percent of payroll.

The Software/IT sector includes software publishers, computer systems design, and data processing services. This includes companies that develop and publish packaged software; develop customized software; and design computer systems to meet the needs of a particular customer. Data centers, internet service providers, and web hosting companies are also part of this industry.

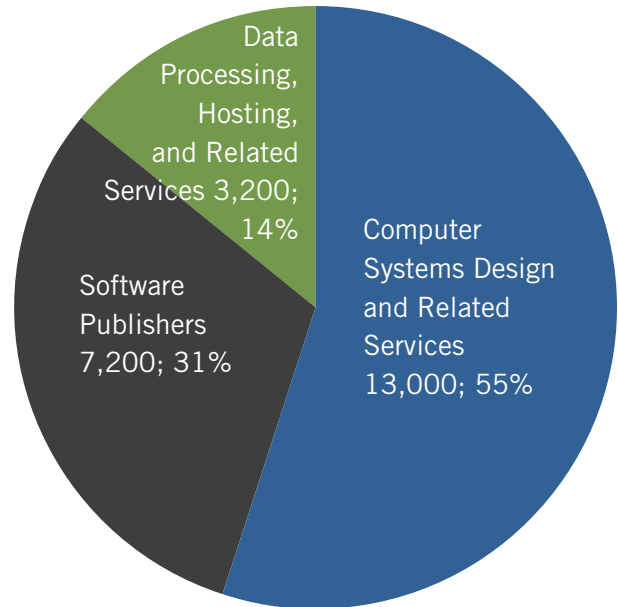
Half of the sector's workforce consists of computer and engineering-related occupations such as computer analysts, programmers, software developers and electrical engineers (12,100 jobs).

The Software/IT industry is unique in that it is comprised of many occupations which are also found outside the sector; a wide variety of companies use some form of computer technology in their day-to-day operations. An additional 28,000 Software/IT-related jobs (e.g. software developers) are found in places such as hospitals, banks and warehouses. This report focuses on the Software/IT sector.

The region's Software/IT employment is disproportionately located in Multnomah and Washington Counties (80%), where employment is primarily clustered in downtown Portland and along Highways 26 and 217.

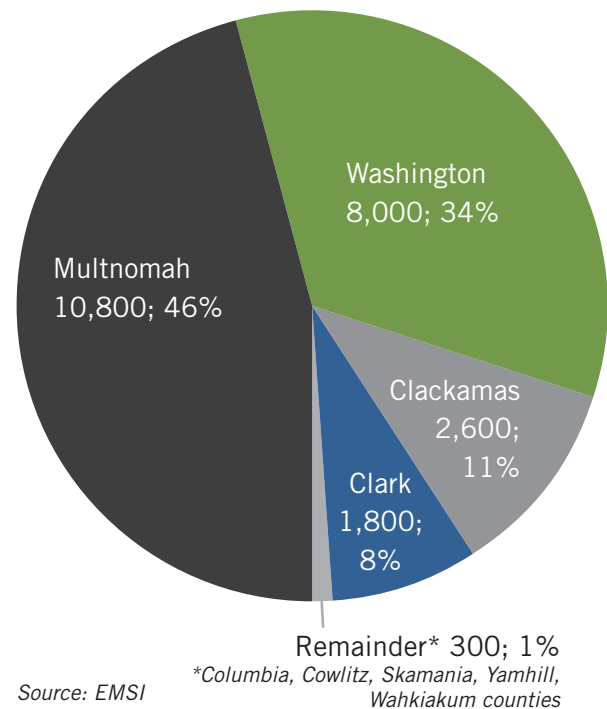
Clark and Clackamas counties each account for roughly 10 percent of regional employment in the sector.

**SOFTWARE/IT EMPLOYMENT BY COMPONENT
GREATER PORTLAND REGION, 2015**



Source: EMSI

**SOFTWARE/IT JOBS BY COUNTY
GREATER PORTLAND REGION, 2015**

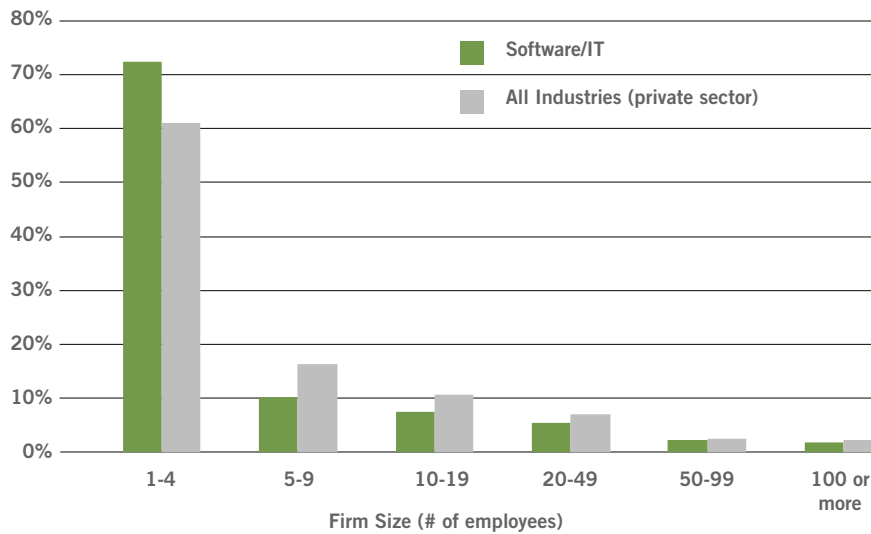


Source: EMSI

*Columbia, Cowlitz, Skamania, Yamhill, Wahkiakum counties

FIRM CHARACTERISTICS

FIRMS BY SIZE CLASS: SOFTWARE/IT GREATER PORTLAND REGION



Source: Oregon Employment Department, Washington Employment Security Department

The vast majority of Software/IT firms employ fewer than 10 workers.

The Software/IT sector has more small firms compared to the overall economy.

Larger firms (50+ employees) account for well over half of the total employment.

MAJOR EMPLOYERS

Act-On	Local Net
Autodesk	Mentor Graphics
Automatic Data Processing Inc.	Navex Global
Cadence Design Systems	Oracle
Digimarc Corporation	Sage
EarthLink Business	Salesforce.com
Elemental Technologies	ServerLogic
Fiserv, Inc.	Springbrook Software
Gravitate	Synopsys, Inc.
Jama Software	Tripwire, Inc.
Janrain	Urban Airship
Jenkon	Viewpoint Construction Software
Jive Software	

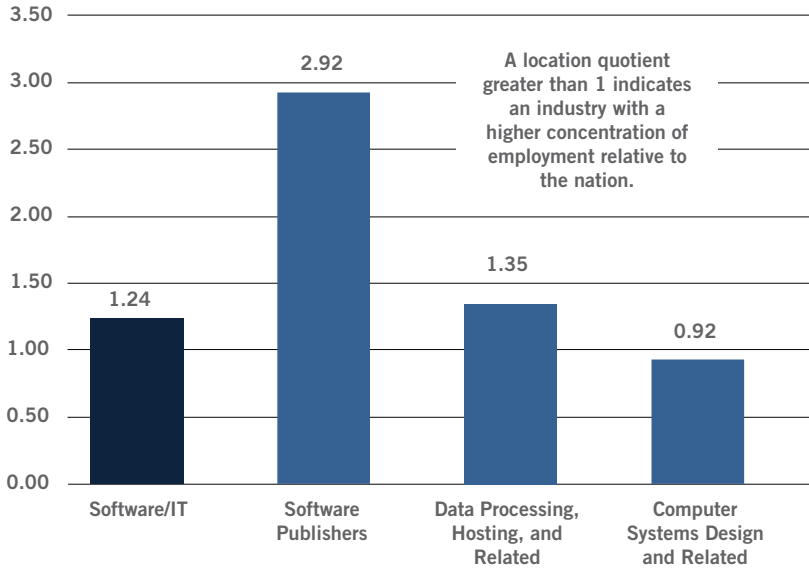
Source: Equifax (EMSI), The Business Journal, The Oregonian

The Software/IT industry is characterized by acquisitions, mergers, and spin-offs. Portland start-up Jive Software alone produced alums who migrated to at least 10 other companies.

The industry is also a magnet for venture capital (money provided by investors to start ups with perceived long-term growth potential). Janrain's \$27 million was the highest venture round of 2015. Urban Airship (\$21 million), Jama (\$20 million), and PayRange (\$12 million) are some of the other Software/IT firms securing big deals.

CONCENTRATION

**LOCATION QUOTIENTS
SOFTWARE/IT AND COMPONENTS
GREATER PORTLAND REGION: 2014**



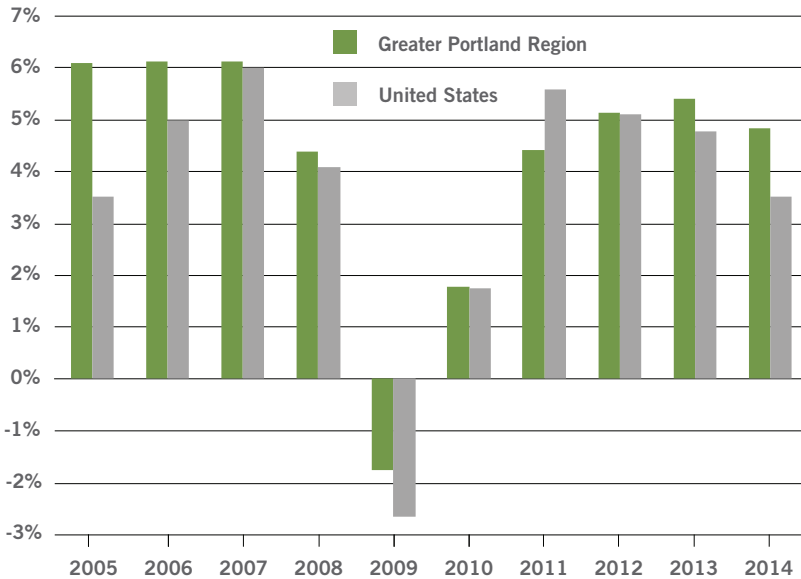
Location quotients are used to measure a sector's employment concentration in an area. A number greater than one indicates a higher concentration of employment relative to the nation.

The Portland region is a net exporter of Software/IT goods and services, most notably in software.

Source: Oregon Employment Dept.; Washington Employment Security Dept., U.S. Bureau of Labor Statistics

EMPLOYMENT TRENDS

**SOFTWARE/IT EMPLOYMENT ANNUAL GROWTH RATES
GREATER PORTLAND REGION VS. UNITED STATES**



Source: EMSI

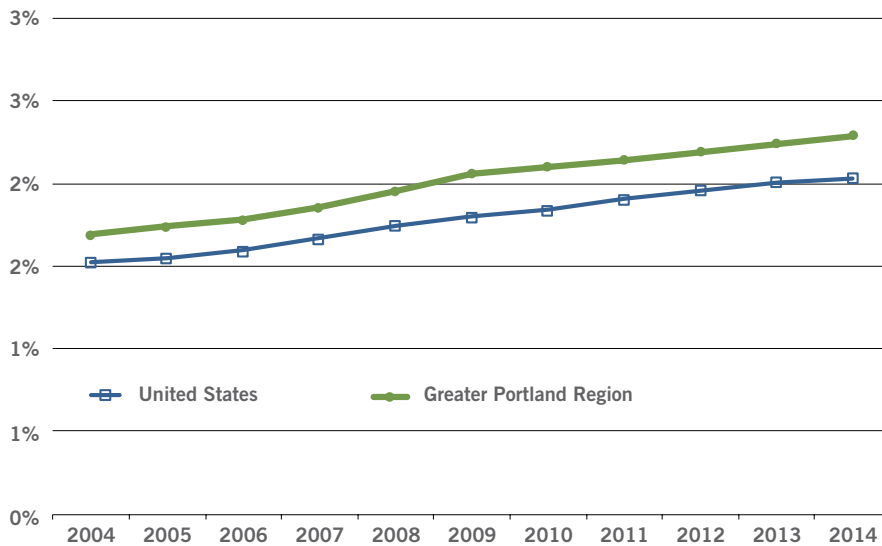
Job growth in the region's Software/IT sector has outperformed the nation in all but one of the last 10 years.

The sector emerged relatively unscathed from the Great Recession, losing just 300 jobs in 2009 which were quickly regained the following year.

In the years following the recession, the sector has added jobs twice as fast as the rest of the economy.

Oregon's and Washington's growth has kept pace with, or exceeded, other IT powerhouse areas such as California and Washington DC while lagging behind Texas.

SOFTWARE/IT'S SHARE OF EMPLOYMENT GREATER PORTLAND REGION AND U.S.

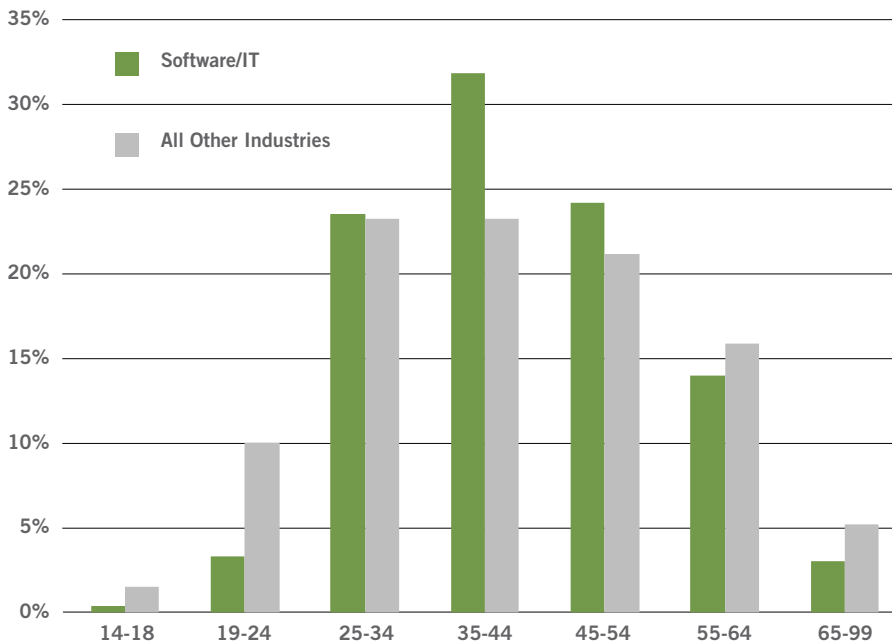


Proportionately, Software/IT is a larger component of the region's economy compared to the nation's and its share of total employment is steadily increasing.

Source: Oregon Employment Dept.; Washington Employment Security Dept., U.S. Bureau of Labor Statistics

CHARACTERISTICS OF THE WORKFORCE

SOFTWARE/IT EMPLOYMENT BY AGE GREATER PORTLAND REGION: 2014



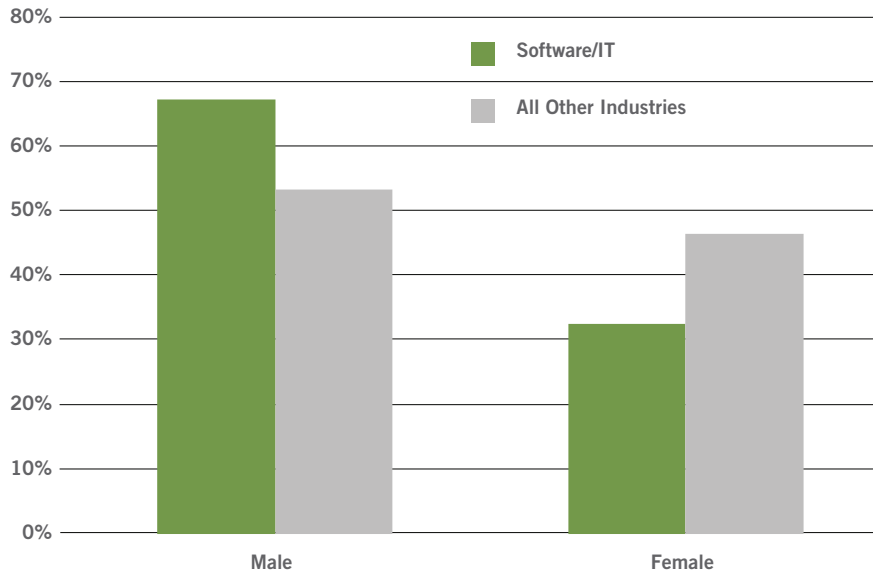
The Software/IT workforce is young. Nearly two-thirds of workers are under 45 years of age.

The younger workforce reflects the industry's relative newcomer status along with its rapid growth and technical skill requirements.

Recent graduates are more apt to possess the education and latest skills required of many Software/IT occupations, and are therefore better prepared to fill the thousands of jobs that have been created over the past decade.

Source: U.S. Census Bureau; Longitudinal Employer-Household Dynamics

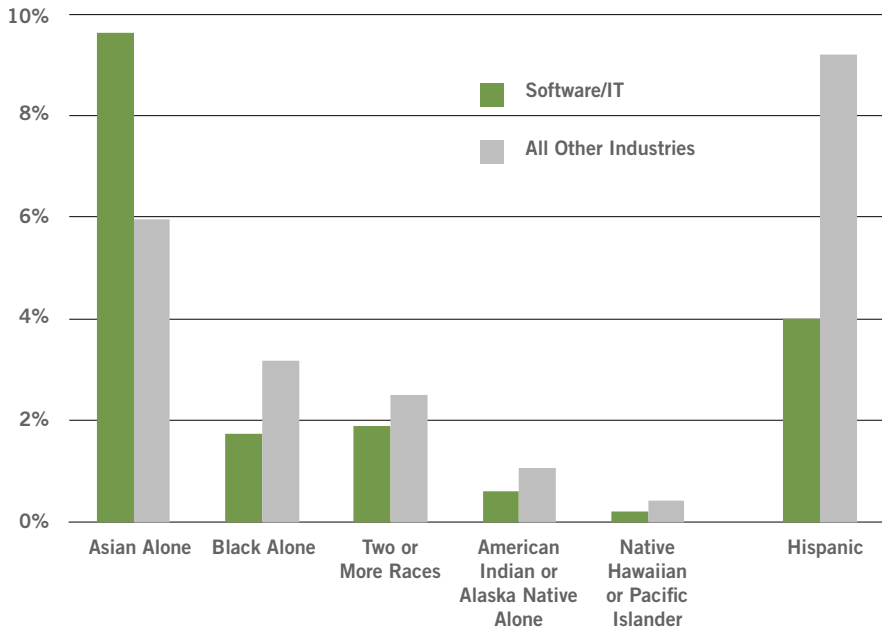
**SOFTWARE/IT EMPLOYMENT BY GENDER
GREATER PORTLAND REGION: 2014**



Source: U.S. Census Bureau; Longitudinal Employer-Household Dynamics

The Software/IT workforce is predominantly male. Men account for two-thirds (67.4%) of workers compared to just over half (53.4%) for all industries.

**SOFTWARE/IT EMPLOYMENT BY RACE (NON-WHITE) AND ETHNICITY
GREATER PORTLAND REGION: 2014**



Source: U.S. Census Bureau; Longitudinal Employer-Household Dynamics

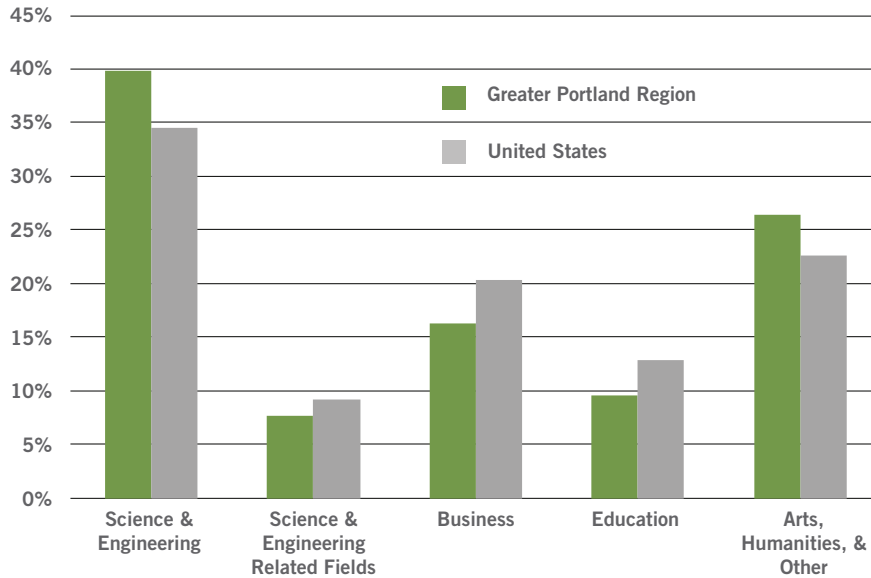
Whites make up the vast majority of the Software/IT workforce (86%), similar to the Region's workforce as a whole (87%).

As a share of employment, nearly twice as many Asians and half as many Blacks and Hispanics work in Software/IT compared to other industries.

The region's Tech community has pledged to address the underrepresentation of women and communities of color in the industry.

POPULATION BY FIELD OF DEGREE

**POPULATION (25+) BY FIELD OF BACHELOR'S DEGREE
PORTLAND METRO AREA AND U.S.: 2014**



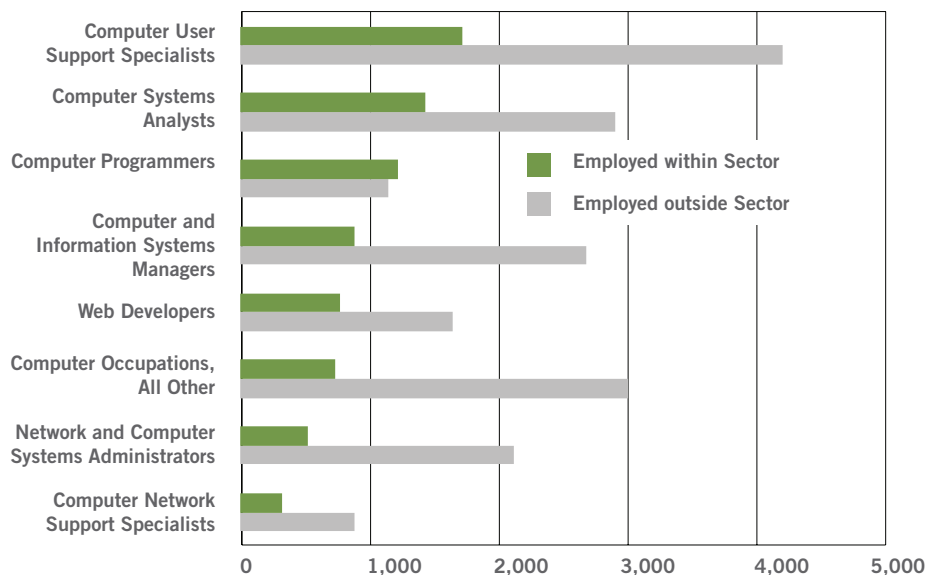
Nearly 600,000 of the region's residents (25 years+) hold a Bachelor's degree or higher. About half of these degrees are in Science, Engineering, and Related Fields.

Portland area residents are more likely to hold a degree in Science and Engineering compared to the nation.

Source: U.S. Census Bureau

OCCUPATIONS

**TOP SOFTWARE/IT OCCUPATIONS
EMPLOYMENT WITHIN SECTOR VS. OUTSIDE OF SECTOR
GREATER PORTLAND REGION: 2015**



Software/IT jobs are found in virtually all segments of the economy.

The top 10 Software/IT occupations employ twice as many people outside the sector than within it.

Source: EMSI

TOP SOFTWARE/IT OCCUPATIONS (ALL INDUSTRIES): GREATER PORTLAND REGION

Occupation	2014 Employment	2024 Employment	Estimated Annual Openings Due to Growth
Software Developers, Applications	6,213	7,970	176
Computer User Support Specialists	5,692	7,012	132
Software Developers, Systems Software	4,458	5,383	93
Computer Systems Analysts	4,114	5,393	128
Computer Occupations, All Other	3,665	4,052	39
Computer and Information Systems Managers	3,435	4,153	72
Network and Computer Systems Administrators	2,540	3,092	55
Web Developers	2,341	2,767	43
Computer Programmers	2,289	2,723	43
Computer Network Support Specialists	1,174	1,347	17

Source: EMSI

Approximately 270 different occupations are represented in the Software/IT sector. The 10 largest comprise more than half (57%) of sector employment.

SOFTWARE/IT OCCUPATIONS: TOP OCCUPATIONS: GREATER PORTLAND REGION

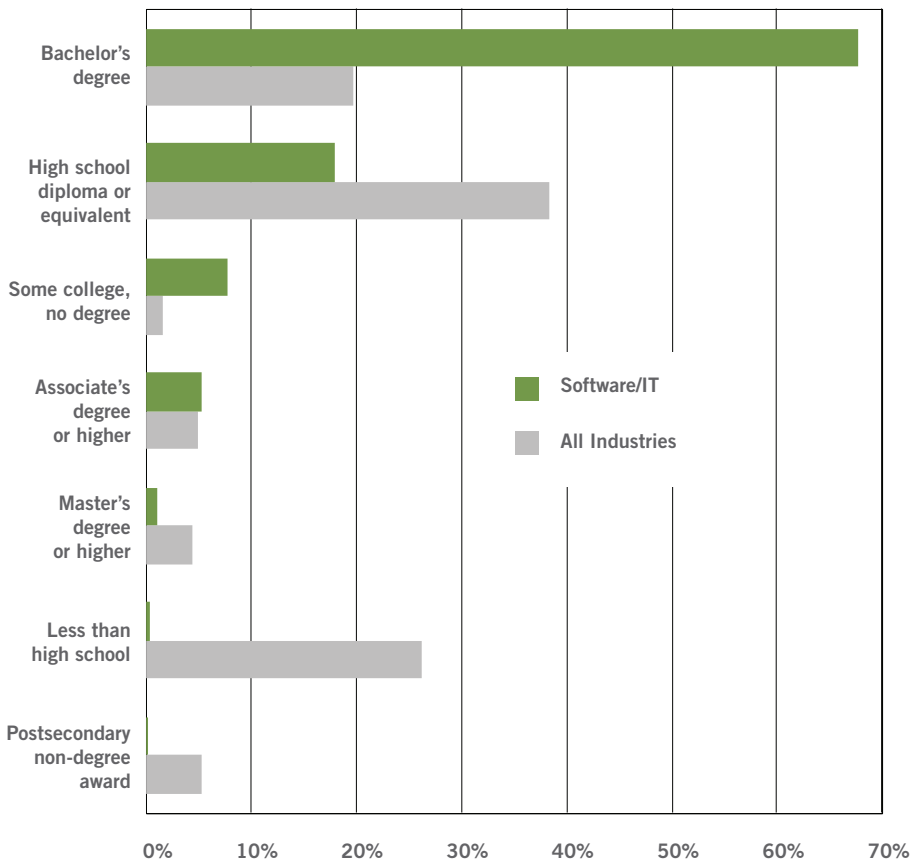
Occupation	2014 Sector Employment	% of Sector Employment	2014 Median Wage*	% of Median Wage for All Occupations	Location Quotient*	Typical Entry Level Education
Software Developers, Applications	3,042	14.1%	\$43.95	233%	1.22	Bachelor's degree
Software Developers, Systems Software	1,650	7.6%	\$48.93	259%	1.57	Bachelor's degree
Computer User Support Specialists	1,605	7.4%	\$22.56	119%	1.32	Some college, no degree
Computer Systems Analysts	1,351	6.3%	\$41.40	219%	1.02	Bachelor's degree
Computer Programmers	1,173	5.4%	\$34.81	184%	1.01	Bachelor's degree
Computer and Information Systems Managers	841	3.9%	\$54.58	289%	1.37	Bachelor's degree
Web Developers	736	3.4%	\$34.24	181%	2.62	Associate's degree
Computer Occupations, All Other	704	3.3%	\$39.10	207%	2.26	Bachelor's degree
Customer Service Representatives	602	2.8%	\$16.65	88%	0.98	High school diploma or equivalent
Sales Reps, Wholesale & Manufacturing, Technical & Scientific Products	564	2.6%	\$32.06	170%	1.38	Bachelor's degree

*7-county metro area

Source: EMSI

EDUCATIONAL REQUIREMENTS

**SOFTWARE/IT EMPLOYMENT BY TYPICAL ENTRY-LEVEL EDUCATION
GREATER PORTLAND REGION: 2015**



Source: EMSI

Innovating, designing, coding, and supporting the wide array of dynamic and complex IT products requires a well-educated and highly-skilled workforce. More than half of the sector's occupations, which account for two-thirds its current workforce, require a Bachelor's degree or higher.

The Sector requires higher-than-average levels of education and training.

Two-thirds of Software/IT workers hold a Bachelor's degree or higher compared to one-quarter of workers across all industries.

Code Oregon is an online training program funded by the public workforce system that teaches people to code in a variety of programming languages including Android, HTML, CSS, Apple's iOS, WordPress, PHP, Python, JavaScript, Ruby, and others. To date, **16,500 people** have used Code Oregon with **150,000 badges** earned. Code Oregon is designed to bolster the talent pipeline to support the region's growing tech sector.

**TRAINING AND DEGREE GRADUATE COMPLETER DATA FOR SOFTWARE/IT-RELATED PROGRAMS:
GREATER PORTLAND REGION**

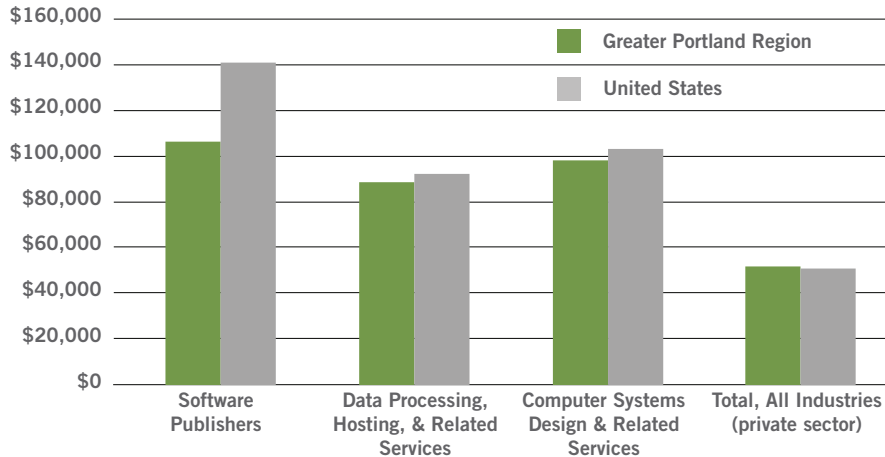
Training	2013 Completers	Type of Credential Granted					
		Award less than 2 years	Assoc.	Bachelor's	Postbac. Certificate	Master's	Doctorate
Bioinformatics	106				73	30	3
Business, Management, Marketing, and Related Support Services, Other	61			61			
Computer and Information Sciences, General	17	6	4	7			
Computer and Information Systems Security/Information Assurance	1				1		
Computer Engineering, General	11			8		1	2
Computer Graphics	39			39			
Computer Programming, Specific Applications	108	53	55				
Computer Programming/Programmer, General	18	1	16	1			
Computer Science	127			89		35	3
Computer Software Engineering	16				4	12	
Computer Systems Analysis/Analyst	6			6			
Computer Systems Networking and Telecommunications	127	15	110	1		1	
Customer Service Support/Call Center/Teleservice Operation	27	27					
Information Science/Studies	1			1			
Information Technology	16	1	10	5			
Management Information Systems, General	91	58		26	1	6	
Marketing/Marketing Management, General	215	10	11	194			
Mathematics and Computer Science	7			7			
Medical Informatics	20		20				
Meeting and Event Planning	2	2					
Network and System Administration/Administrator	50		30	20			
Operations Management and Supervision	63	35	9	19			
Receptionist	5	5					
Retailing and Retail Operations	27	26	1				
Selling Skills and Sales Operations	7	1	6				
System, Networking, and LAN/WAN Management/Manager	21	11	10				
Web Page, Digital/Multimedia and Information Resources Design	69	19	38	12			
Web/Multimedia Management and Webmaster	11		11				
TOTALS	1,269	270	331	496	79	85	8

Source: EMSI

The institution data in this report is taken directly from the national IPEDS database published by the U.S. Department of Education's National Center for Education Statistics.

WAGES

ANNUAL AVERAGE WAGES FOR COMPONENTS OF SOFTWARE/IT: GREATER PORTLAND REGION AND U.S.: 2014



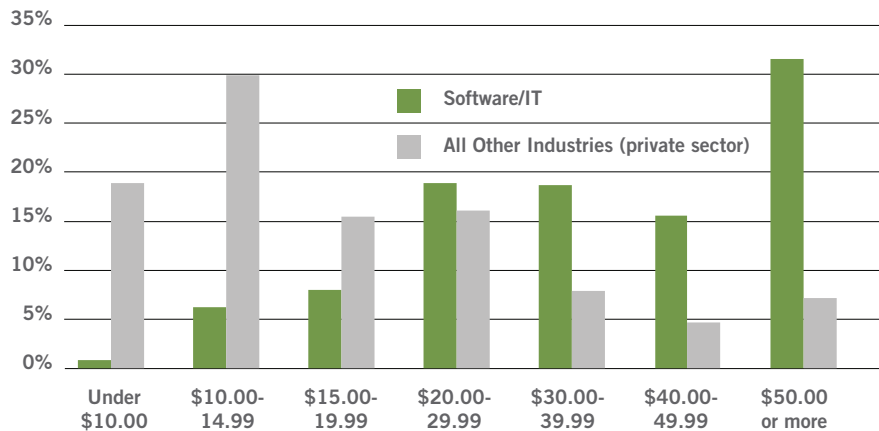
The Software/IT sector is comprised of high-paying industries. However, each component pays less than its national counterpart. Overall, the sector's average wage is \$99,800 compared to \$107,000 nationally- or 93 cents on the dollar.

Source: Oregon Employment Department, U.S. Bureau of Labor Statistics

SOFTWARE/IT AVERAGE ANNUAL WAGES: 2014

	Greater Portland Region	United States
Total, Software/IT	\$99,803	\$107,302
Software Publishers	\$106,711	\$141,541
Data Processing, Hosting, & Related	\$89,090	\$92,464
Computer Systems Design & Related	\$98,386	\$103,644
Total, All Industries	\$51,797	\$51,295

SOFTWARE/IT SHARE OF EMPLOYMENT BY HOURLY WAGE OREGON: 2014



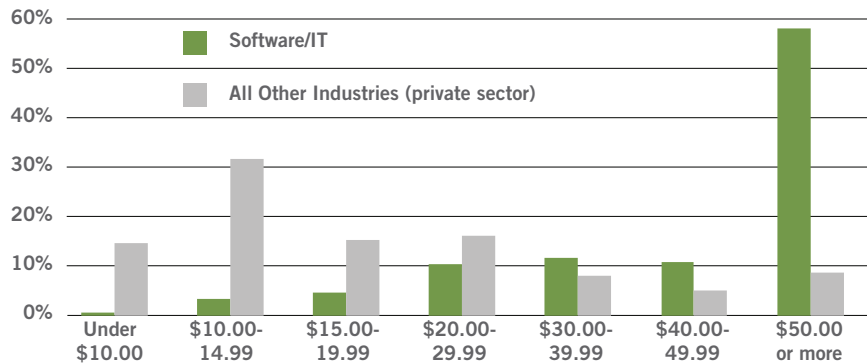
In Oregon, the median wage in Software/IT is \$38.37 (2014); more than double that of all industries (\$15.40).

Two-thirds of the workforce earns \$30 an hour or more compared to one-fifth of workers across all industries.

Nearly half of all workers earn \$40/hour or more.

Source: Oregon Employment Dept.; Unemployment Insurance Wage Records

SOFTWARE/IT SHARE OF EMPLOYMENT BY HOURLY WAGE WASHINGTON: 2014



Source: Washington Employment Security Department

In Washington statewide, the majority (58%) of the Software/IT workforce earns \$50 hourly or more compared to 9 percent of workers across all other industries. Many of these jobs are likely located at Microsoft.

TURNOVER

TURNOVER RATE IN SOFTWARE/IT GREATER PORTLAND REGION: 2014

Total, Software/IT	8.2%
Software Publishers	6.4%
Data Processing, Hosting, and Related Services	7.1%
Computer Systems Design and Related Services	9.5%
Total, All Private Sector Industries	9.5%

Source: Oregon Employment Dept. analysis of U.S. Census Bureau (LEHD) data

Turnover refers to the change in the workforce due to employee separations and hiring.

The Software/IT sector experiences a lower turnover than that for all industries (private sector).

TOP OCCUPATIONAL VACANCIES IN THE INFORMATION INDUSTRY PORTLAND TRI-COUNTY: 2015

	2015 Vacancies, All Industries
Computer Occupations, All Other	390
Customer Service Representatives	255
Software Developers, Applications	203
Web Developers	39
Network and Computer Systems Administrators	28
Software Developers, Systems Software	7
Computer Network Support Specialists	7
Computer User Support Specialists	1

Tri-County: Clackamas, Multnomah, Washington counties

NOTE: Information not available for SW Washington

Source: Oregon Employment Department, 2015 Job Vacancy Survey

Workers in software publishing are more likely to stay at their current jobs while workers in computer systems design tend to move between companies and industries more frequently.

The Portland region has lower turnover than Austin, Denver, Salt Lake, San Francisco and Minneapolis, and about the same as San Jose.

CURRENT SUPPLY

REGISTERED JOBSEEKERS SOFTWARE/IT: PORTLAND METRO AREA (OREGON PORTION) AUGUST 2015

Occupation	Jobseekers ¹
Software Developers, Systems Software	424
Computer Systems Analysts	727
Web Developers	625
Computer and Information Systems Managers	535
Network and Computer Systems Administrators	737
Computer Programmers	602
Computer Occupations, All Other	1,674
Software Developers, Applications	659
Sales Reps, Wholesale & Manufacturing, Technical & Scientific Products	878
Computer User Support Specialists	1,453

¹ Data represents jobseekers registered with The Oregon Employment Department, iMatchSkills (active status, August 2015). Data is self-reported. Job seekers can include more than one occupation in their IMS profile, therefore job seekers might be counted more than once in the data.

NOTE: Information not available for SW Washington

Portland Metro Area (Oregon portion): Clackamas, Columbia, Multnomah, Washington, Yamhill counties

Source: Oregon Employment Department

There are several ways to depict the current supply of workers. Unemployment Insurance (UI) claimants are a subset of jobseekers and does not include those unemployed workers who don't qualify for, or have exhausted, benefits. This data is only available in Washington State. Persons registered with the Oregon Employment Department are both employed and unemployed jobseekers including but not limited to those receiving unemployment benefits. This is a much larger pool of workers than UI claimants.

UNEMPLOYMENT INSURANCE CLAIMANTS SOUTHWEST WASHINGTON AUGUST 2015

Occupation	Claimants ¹
Computer Software Engineers, Systems Software	4
Computer Systems Analysts	9
Web Designers	-
Computer and Information Systems Managers	17
Network and Computer Systems Administrators	8
Computer Programmers	4
Computer Specialists, All Other	4
Computer Software Engineers, Applications	7
Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	16
Computer Support Specialists	17

¹ Data represents claimants registered with The Washington Employment Security Department (active status, August 2015).

Southwest Washington: Clark, Cowlitz, Wahkiakum, Skamania counties

Source: Washington Employment Security Department

In Southwest Washington, there were just 86 unemployed workers claiming unemployment insurance in Software/IT's 10 largest occupations (August 2015).

CURRENT DEMAND

SOFTWARE/IT OCCUPATIONS WITH LARGEST NUMBER OF HELP-WANTED ONLINE (HWOL) LISTINGS GREATER PORTLAND REGION: SUMMER 2015

Occupation	HWOL Ads- Sector	HWOL Ads- All Industries
Computer Occupations, All Other	214	1,496
Software Quality Assurance Engineers and Testers	95	511
Information Technology Project Managers	85	694
Computer Systems Engineers/Architects	33	244
Geographic Information Systems Technicians	2	12
Software Developers, Applications	178	1,425
Network and Computer Systems Administrators	132	821
Computer Systems Analysts	124	893
Computer Systems Analysts	115	865
Informatics Nurse Specialists	8	29
Web Developers	75	707
Computer User Support Specialists	73	777
Computer Programmers	48	298
Management Analysts	40	449
Network and Computer Systems Administrators	21	247
Software Developers, Systems Software	20	201
All Occupations In Sector	1,329	

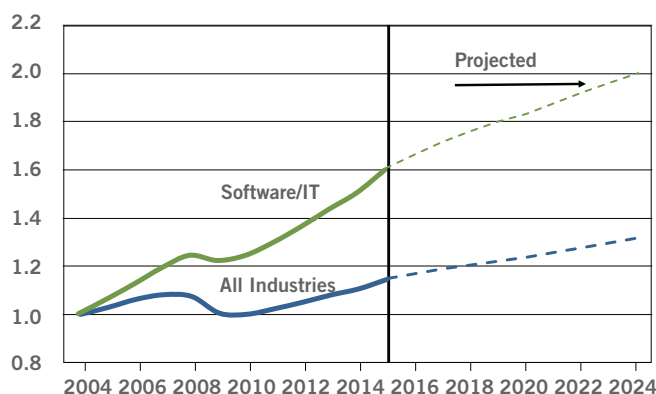
3-month average: June, July, August 2015

Note: Only about half of HWOL ads have an identified industry, so the Sector totals are a lower-bound figure.

Source: The Conference Board, Help-Wanted OnLine (HWOL) data series

LONG-TERM DEMAND

HISTORICAL & PROJECTED GROWTH: GREATER PORTLAND REGION 2004 INDEXED TO 1



Source: EMSI

Technological innovation and mounting demand will fuel strong growth in Software/IT over the coming years. Cloud computing and cyber security will power the growing mobile computing market, and these devices will rely on software to become more powerful, efficient, and secure.

Between 2014 and 2024, the Software/IT sector is projected to add more than 7,000 jobs for a growth rate of 33 percent; significantly faster than the overall economy (19%).

Half of the new jobs will be located in Multnomah County.

**OCCUPATIONS ADDING THE LARGEST NUMBER OF JOBS: SOFTWARE/IT
GREATER PORTLAND REGION**

Occupation	2014	2024	Growth	Percent Growth	Share of Sector Growth	Projected Annual Growth Openings
Software Developers, Applications	3,042	4,202	1,160	38%	16%	116
Computer User Support Specialists	1,605	2,273	668	42%	9%	67
Software Developers, Systems Software	1,650	2,233	583	35%	8%	58
Computer Systems Analysts	1,351	1,819	468	35%	7%	47
Computer Programmers	1,173	1,468	295	25%	4%	30
Computer and Information Systems Managers	841	1,104	263	31%	4%	26
Web Developers	736	939	203	28%	3%	20
Network and Computer Systems Administrators	494	679	185	37%	3%	19
Customer Service Representatives	602	782	180	30%	3%	18
General and Operations Managers	550	724	174	32%	2%	17
Sales Representatives, Services, All Other	490	662	172	35%	2%	17
Market Research Analysts and Marketing Specialists	336	506	170	51%	2%	17
Sales Reps, Wholesale & Mfg., Except Technical and Scientific Products	564	726	162	29%	2%	16
Computer Occupations, All Other	704	857	153	22%	2%	15
Management Analysts	301	419	118	39%	2%	12
Total Sector	21,609	28,731	7,153	33%		715

Source: EMSI

Roughly one-quarter of jobs in the five largest occupations are held by women (applying a national gender employment ratio). Factoring in job growth projections, an additional 3,900 women would need to be employed in these occupations by 2024 to achieve gender parity.

IMPORTING TALENT

H-1B VISAS FOR SOFTWARE/IT-RELATED OCCUPATIONS GREATER PORTLAND REGION: 2014

Occupation	# of Certified H-1B Visas
Computer Systems Analysts	684
Computer Programmers	449
Computer Occupations, All Other	403
Software Developers, Applications	346
Software Developers, Systems Software	296
Network And Computer Systems Administrators	40
Database Administrators	22
Computer and Information Research Scientists	18
Information Security Analysts	8
Computer User Support Specialists	5

Source: Myvisajobs.com

Oregon remains an attractive place for Software/IT employment. Employed workers in computer-related occupations account for 2-3 percent of total net migration to the state.

IT talent also comes from the H-1B Visa program, which allows employers to temporarily employ foreign workers in specialty occupations including engineering, math and medicine. Jobs filled by H-1B Visa workers typically require a Bachelor's degree or higher.

Nearly 4,000 H-1B visas were certified in the Portland region in 2014. More than one-half were issued for occupations prevalent in the Software/IT sector.

H-1B VISAS FOR SOFTWARE/IT-RELATED OCCUPATIONS GREATER PORTLAND REGION: 2014

City	H-1B Visas	Share of Total
Beaverton	754	33%
Hillsboro	676	30%
Portland	557	25%
Lake Oswego	111	5%
Vancouver	68	3%
Newberg	33	1%
All Other Cities	72	3%

Source: Myvisajobs.com

Nine out of 10 certified visas were filed by companies in just three cities: Hillsboro, Beaverton, and Portland. The Portland metro area is not a heavy user of H-1B visas relative to other areas in the country. However, we do stand out (along with Seattle, Durham, and San Diego) in that a small handful of large employers drive the majority of demand for H-1B visas in our region.

THE COLUMBIA-WILLAMETTE WORKFORCE COLLABORATIVE



These programs funded in whole or part through the U.S. Department of Labor. We are equal opportunity employers/programs. Auxiliary aids and services are available upon request to individuals with disabilities.