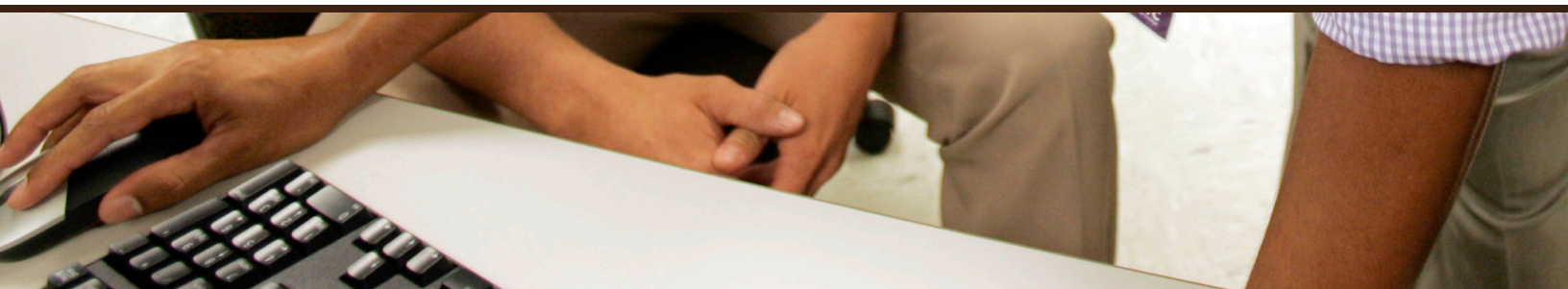




AN EXAMINATION OF THE INFORMATION TECHNOLOGY JOB MARKET

A CREDENTIALS THAT WORK RESEARCH BRIEF
BY MYRIAM MILFORT

AUGUST 2012





JOBS FOR THE FUTURE

Jobs for the Future aligns education with today's high-demand careers. With its partners, JFF develops policy solutions and new pathways leading from college readiness to career advancement for struggling and low-income populations in America.

WWW.JFF.ORG



Credentials that Work is a JFF initiative that seeks to utilize innovations in the collection and use of real-time labor market information to better align investments in education and training with the needs of the economy. Stronger alignment will ensure that education credentials have high value for both workers and employers.

ABOUT THE AUTHOR

Myriam Milfort is a senior project manager in JFF's Building Economic Opportunity Group, where she manages Credentials that Work, JFF's emerging work in the development and application of real-time labor market information and workforce research. She is coauthor, with John Dorrer, of *Vendor Product Review: A Consumer's Guide to Real-time Labor Market Information*. Before joining JFF, Ms. Milfort served as a Presidential Management Fellow for two offices within the U.S. Department of Labor where she managed LMI grants for 10 states and oversaw key convenings of state and federal LMI stakeholders. Ms. Milfort previously worked at the Federal Reserve Bank of Boston and J.P. Morgan Chase & Co.

TABLE OF CONTENTS

INTRODUCTION	1
METHODOLOGY	2
GENERAL TRENDS IN THE IT INDUSTRY	3
IT JOB TRENDS DURING THE RECESSION	5
INDUSTRIES HIRING IT WORKERS	7
GEOGRAPHIC DISTRIBUTION OF IT JOBS	8
IT SKILLS AND CERTIFICATIONS	9
SUPPLEMENTAL REAL-TIME FIGURES	12
SUMMARY AND CONCLUSION	16
APPENDIX: ABOUT REAL-TIME LABOR MARKET INFORMATION	18
ENDNOTES	19

INTRODUCTION

Notwithstanding 13.7 million unemployed workers in 2011 and an 8.2 percent national unemployment rate in June 2012, information technology occupations continue to offer opportunities for jobseekers with the requisite skills and credentials. In the most recent edition of its *Occupational Outlook Handbook*, the Bureau of Labor Statistics (BLS) reported it expects IT employment to grow “much faster than the average” of all occupations through 2018.¹ In May 2011, in the midst of the recession, a survey by ManpowerGroup found that “52 percent of U.S. employers are experiencing difficulty filling mission critical positions within their organizations,” declaring a lack of technical skills and experience as the main reasons jobs remained vacant.²

This brief examines changes in the numbers of IT-sector jobs since the recession began in late 2007. It utilizes job posting data to examine four types of data:

- > Hiring trends;
- > Skills and certifications sought by employers;
- > Employers with the largest number of job ads; and
- > Emerging IT job titles, skills, and certifications.

This report was created for the 10 community colleges and systems in the Credentials that Work Innovators Network to demonstrate and evaluate the use of both traditional and real-time labor market information to analyze workforce trends. Credentials that Work is an initiative to utilize innovations in the collection and use of real-time LMI to better align investments in education and training with the needs of the economy. The initiative is funded by Lumina Foundation and the Joyce Foundation.³

METHODOLOGY

JFF gathered the data in this report from several sources, all accessed in February 2012:

- > Unemployment, traditional job projections, and Job Openings and Labor Turnover Survey (JOLTS) data come from the BLS and Economic Modeling Specialists Inc., a provider of labor market data. Occupational projections data come from EMSI and cover the six years 2011 through 2016.
- > JFF gathered real-time job postings data for 2011 using Labor Insight, a real-time LMI tool from Burning Glass Technologies.

For this brief, 17 computer-related occupations, as designated in Standard Occupational Classification (SOC) codes, demonstrate IT-sector performance since the recession began (see *Table 1*).

TABLE 1.
GENERAL TRENDS IN THE IT INDUSTRY, 2011-2016

SOC CODE	DESCRIPTION	2011 JOBS	2016 JOBS	% CHANGE	ANNUAL OPENINGS	2011 MEDIAN HOURLY WAGE	2011 JOB POSTINGS	EDUCATION LEVEL
11-3021	Computer and information systems managers	319,269	340,589	7%	9,585	\$50.59	14,328	Degree plus work experience
15-1011	Computer and information scientists, research	30,876	33,718	9%	1,242	\$44.57	1,775	Doctoral degree
15-1021	Computer programmers	434,326	427,275	(2%)	9,711	\$30.93	374,282	Bachelor's degree
15-1031	Computer software engineers, applications	557,592	628,208	13%	18,934	\$39.72	285,931	Bachelor's degree
15-1032	Computer software engineers, systems software	431,800	480,493	11%	13,604	\$42.28	109,625	Bachelor's degree
15-1041	Computer support specialists	568,188	599,506	6%	22,480	\$20.90	120,058	Associate's degree
15-1051	Computer systems analysts	608,528	656,515	8%	22,940	\$33.77	194,189	Bachelor's degree
15-1061	Database administrators	114,219	123,946	9%	3,879	\$33.17	102,878	Bachelor's degree
15-1071	Network and computer systems administrators	359,415	395,451	10%	13,264	\$31.48	120,271	Bachelor's degree
15-1081	Network systems and data communications analysts	405,766	471,917	16%	20,545	\$27.26	69,083	Bachelor's degree

Table 1 continues on page 3.

GENERAL TRENDS IN THE IT INDUSTRY

Rapid technological developments have led to a diffusion of information technology, and that has translated into an increased demand for IT workers across all industries and all sectors.⁴ In 2011, approximately 4.8 million people nationally were employed in IT jobs, with an estimated average 177,550 jobs open annually (see *Table 1*).⁵ Between 2011 and 2016, IT occupations are projected to grow by 8 percent. In 2010, 63 percent of IT workers were aged between 25 and 44 years old, and men held 77 percent of IT jobs. IT workers could be found across industries, with a substantial number employed at administrative and support services companies, financial institutions, insurance companies, government agencies, educational institutions, software publishers, telecommunications organizations, and health care organizations.

TABLE 1. CONTINUED GENERAL TRENDS IN THE IT INDUSTRY, 2011-2016

SOC CODE	DESCRIPTION	2011 JOBS	2016 JOBS	% CHANGE	ANNUAL OPENINGS	2011 MEDIAN HOURLY WAGE	2011 JOB POSTINGS	EDUCATION LEVEL
15-1099	Computer specialists, all other	225,543	237,778	5%	7,389	\$34.49	829	Associate's degree
17-2061	Computer hardware engineers	68,630	68,579	0%	2,450	\$46.25	7,217	Bachelor's degree
27-1014	Multimedia artists and animators	181,824	201,261	11%	7,972	\$11.77	9,604	Bachelor's degree
27-1024	Graphic designers	385,511	418,159	8%	18,479	\$17.11	31,934	Bachelor's degree
27-3042	Technical writers	51,404	55,281	8%	1,636	\$28.31	23,517	Bachelor's degree
27-4011	Audio and video equipment technicians	65,499	69,691	6%	2,840	\$16.37	7,108	Postsecondary vocational award
43-9031	Desktop publishers	30,220	28,650	(5%)	601	\$15.24	1,225	Postsecondary vocational award
	Total	4,838,610	5,237,018	8%	177,550	\$31.54	1,473,854	

SOURCES: 2011-2016 Projections, Openings and Wage: EMSI Complete Employment-2011.4; 2011 Job Postings: Burning Glass, Labor Insight, Education Level: Integrated Postsecondary Education Data System (IPEDS)

Job postings data can also demonstrate labor market demand in real time—that is, demand that can be pulled from employer job advertisements and analyzed daily. Table 2 presents IT occupational demand nationally between 2007 through 2011 as measured by job ads data. In 2011, the data show an increase in the number of IT job postings. These data provide historical job posting trends by occupation.

TABLE 2.
DEMAND FOR IT WORKERS, 2007-2011

IT OCCUPATION TITLE	UNDUPLICATED JOB POSTINGS		
	2007	2010	2011
Computer and information systems managers	14,479	10,999	14,328
Network systems and data communications analysts	56,838	51,736	69,083
Computer and information research scientists	1,940	1,651	1,775
Computer systems analysts	189,048	152,167	194,189
Computer programmers	335,584	340,658	374,282
Software developers, applications	231,701	216,438	285,931
Software developers, systems software	94,911	90,045	109,625
Database administrators	101,881	87,898	102,878
Network and computer systems administrators	115,167	95,675	120,271
Computer user support specialists	119,675	91,769	120,058
Computer hardware engineers	7,823	5,560	7,217
Multimedia artists and animators	9,045	8,588	9,604
Graphic designers	35,025	28,162	31,934
Technical writers	24,794	20,335	23,517
Audio and video equipment technicians	8,045	5,632	7,108
Desktop publishers	2,806	1,027	1,225
Computer occupations, all other	922	721	829

IT JOB TRENDS DURING THE RECESSION

Between 2007 and 2009, at the height of the recession, employment in the IT sector declined 2 percent (79,493 jobs). Table 3 highlights recessionary trends by occupation during this time period. Desktop publishers lost 11 percent, and computer programmers and computer hardware engineers each lost 5 percent of their workforce, unlike network analysts and computer specialists whose workforce increased. The decline in U.S. computer programmer jobs is often attributed to outsourcing. Desktop publishing job losses reflect trends in the printing and publishing industries. According to the BLS, desktop publishing skills are now regular job functions in many occupations, and more organizations are formatting materials for display on the Internet rather than designing pages for print publication.⁶

TABLE 3.
IT EMPLOYMENT TRENDS, 2007 VS. 2009, BY OCCUPATION

SOC CODE	DESCRIPTION	2007 JOBS	2009 JOBS	% CHANGE	ANNUAL OPENINGS	2007 JOB POSTINGS	2011 MEDIAN HOURLY WAGE
408281	Computer and information systems managers	321,412	315,141	(2%)	8,611	14,479	\$50.59
15-1011	Computer and information scientists, research	29,150	29,790	2%	1,339	1,940	\$44.57
15-1021	Computer programmers	462,346	438,187	(5%)	11,751	335,584	\$30.93
15-1031	Computer software engineers, applications	534,386	536,003	0%	15,332	231,701	\$39.72
15-1032	Computer software engineers, systems software	419,110	416,747	(1%)	11,210	94,911	\$42.28
15-1041	Computer support specialists	583,168	565,114	(3%)	20,644	119,675	\$20.90
15-1051	Computer systems analysts	604,835	598,157	(1%)	21,244	189,048	\$33.77
15-1061	Database administrators	114,071	112,420	(1%)	3,264	101,881	\$33.17
15-1071	Network and computer systems administrators	357,440	353,902	(1%)	10,515	115,167	\$31.48
15-1081	Network systems and data communications analysts	377,848	386,293	2%	15,753	56,838	\$27.26
15-1099	Computer specialists, all other	217,314	219,779	1%	8,294	922	\$34.49
17-2061	Computer hardware engineers	70,467	66,910	(5%)	2,882	7,823	\$46.25
27-1014	Multimedia artists and animators	176,739	178,467	1%	7,041	9,045	\$11.77
27-1024	Graphic designers	407,808	386,999	(5%)	15,089	35,025	\$17.11
27-3042	Technical writers	51,690	50,361	(3%)	1,578	24,794	\$28.31
27-4011	Audio and video equipment technicians	67,337	65,303	(3%)	2,823	8,045	\$16.37
43-9031	Desktop publishers	35,765	31,818	(11%)	677	2,806	\$15.24
	Total	4,830,885	4,751,392	(2%)	158,047	1,349,684	\$31.54

SOURCE: EMSI Complete Employment-2011.4

Table 4 demonstrates IT job losses by industry sector. At the height of the recession, industries that typically hire IT workers also showed significant decline.

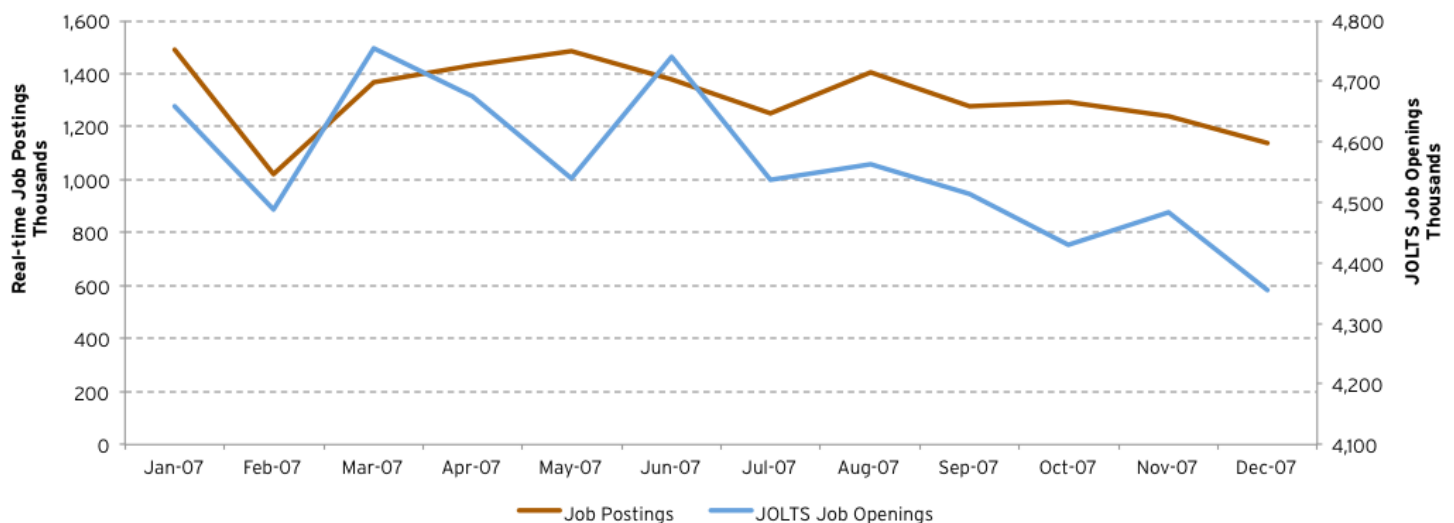
TABLE 4.
EMPLOYMENT TRENDS, 2007 VS. 2009, BY INDUSTRY SECTOR

NAICS CODE	DESCRIPTION	2007 JOBS	2009 JOBS	DIFFERENCE
511210	Software publishers	289,285	288,743	(542)
517110	Wired telecommunications carriers	758,249	737,047	(21,202)
518210	Data processing, hosting, and related services	343,553	316,944	(26,609)
541511	Custom computer programming services	798,056	813,024	14,968
541512	Computer systems design services	796,056	821,337	25,281
541513	Computer facilities management services	73,005	69,538	(3,467)
541519	Other computer related services	147,902	148,094	192
551114	Corporate, subsidiary, and regional managing offices	1,839,219	1,925,830	86,611
561311	Employment placement agencies	297,790	215,725	(82,065)
561320	Temporary help services	2,590,123	1,842,761	(747,362)
	Total	7,933,239	7,179,043	(754,196)

SOURCE: EMSI Complete Employment-2011.4

Using job openings data from JOLTS and job postings data from Labor Insights makes it feasible to explore how job openings tracked during recessionary times. Analyzing these two data sets demonstrates the benefits of multisource analysis. The JOLTS data reveal that national job openings peaked at 4.8 million in March 2007; by the official start of the recession in December 2007, job openings had decreased to 4.4 million. Like job openings, real-time job postings also declined by the start of the recession. Both data sets show a downward trend in openings and ads. Figure 1 demonstrates trends in job openings during the recession compared to job postings for the same period.

FIGURE 1.
U.S. IT JOB POSTINGS BASED ON TRADITIONAL AND REAL-TIME SOURCES, 2007



SOURCE: Burning Glass Labor Insight, Bureau of Labor Statistics, Job Openings and Labor Turnover Survey, 2007

INDUSTRIES HIRING IT WORKERS

In a report about IT workers, EMSI noted that IT jobs are spread across nearly every sector, complicating labor market analysis at the industry level.⁷ The data confirm that many IT occupations are in non-tech industries, as traditional LMI data show between 2011 and 2016. Table 5 shows IT employment in the industries expected to fill the greatest amount of IT occupations over the next five years.

In 2011, 55 percent of all IT job postings were in three industry sectors: professional, scientific, and technical services (30 percent); manufacturing (14 percent); and administrative and support and waste management and remediation services (11 percent) (see Table 6).⁸

TABLE 5.
INDUSTRIES WITH THE HIGHEST NUMBER OF IT JOB OPENINGS, ACTUAL FOR 2011 AND PROJECTED FOR 2016

NAICS	INDUSTRY	2011 JOBS (ACTUAL)	2016 JOBS (PROJECTED)	CHANGE	PERCENT CHANGE
541512	Computer systems design services	567,189	665,450	98,261	17%
541511	Custom computer programming services	556,081	634,416	78,335	14%
551114	Corporate, subsidiary, and regional managing offices	220,427	230,709	10,282	5%
920000	State government	186,110	195,267	9,157	5%
930000	Local government	176,307	184,958	8,651	5%
511210	Software publishers	175,025	197,995	22,970	13%
518210	Data processing, hosting, and related services	116,430	134,699	18,269	16%

SOURCE: EMSI Complete Employment-2011.4

TABLE 6.
IT JOB POSTINGS BY INDUSTRY SECTOR, 2011

INDUSTRY SECTOR	2011 JOB POSTINGS	PERCENTAGE OF TOTAL JOBS
Professional, scientific, and technical services	302,518	30%
Manufacturing	146,319	14%
Administrative and support and waste management and remediation services	109,393	11%
Information	88,231	9%
Finance and insurance	76,494	8%
Educational services	59,100	6%
Health care and social assistance	58,606	6%
Retail trade	51,446	5%
Public administration	34,694	3%
Transportation and warehousing	25,413	3%

SOURCE: EMSI Complete Employment-2011.4

GEOGRAPHIC DISTRIBUTION OF IT JOBS

In 2011, 1,473,025 IT jobs were advertised, with nearly 46 percent concentrated in 20 counties (see *Table 7*). The rest were spread across 180 other counties. The largest number of IT job postings was in California, followed by Texas, New York, Virginia, Illinois, New Jersey, and Massachusetts (see *Table 8*).

TABLE 7.
TOP 20 COUNTIES LISTING IT JOB OPENINGS, 2011

COUNTY	JOB OPENINGS
New York County, NY	58,649
Santa Clara County, CA	49,879
Los Angeles County, CA	47,297
Fulton County, GA	46,396
Cook County, IL	39,810
Maricopa County, AZ	37,632
Dallas County, TX	37,155
Fairfax County, VA	33,668
King County, WA	28,957
Middlesex County, MA	24,661

SOURCE: Burning Glass Labor Insight

COUNTY	JOB OPENINGS
San Francisco County, CA	24,286
Suffolk County, MA	23,803
Harris County, TX	21,990
District of Columbia	20,680
Hennepin County, MN	20,568
San Diego County, CA	20,155
Franklin County, OH	18,883
Orange County, CA	18,320
Travis County, TX	16,785
Mecklenburg County, NC	16,741

TABLE 8.
TOP STATES LISTING IT JOB OPENINGS, 2011

STATES	JOB OPENINGS	PERCENT OF U.S. TOTAL
California	215,785	15%
Texas	109,205	7%
New York	94,507	6%
Virginia	67,842	5%
Illinois	62,987	4%
New Jersey	62,406	4%
Massachusetts	60,142	4%
Seven-state Total	672,874	45%
U.S. Total	1,473,025	100%

SOURCE: Burning Glass Labor Insight

IT SKILLS AND CERTIFICATIONS

In an economy characterized by high unemployment, employers are more selective and require skills and certifications they might have overlooked during time of economic prosperity and tight labor markets. According to job postings in 2011, employers seek IT workers who possess a number of specialized skills and credentials, led by Microsoft Certified Systems Engineer, Cisco Certified Network, and Help Desk Certification (see Table 9).

TABLE 9.
IN-DEMAND IT CERTIFICATIONS, 2011

1. Microsoft Certified Systems Engineer
2. Cisco Certified Network Professional
3. Help Desk Certification (e.g., Comptia)
4. Microsoft Certified Professional
5. Project Management Certification (e.g. PMP)
6. Certified Information Systems Security Professional
7. Cisco Certified Internetwork Expert
8. Microsoft Certified It Professional
9. Microsoft Certified Systems Administrator
10. Network+ Certification
11. Microsoft Certified Technology Specialist
12. Oracle Certification (e.g., Oracle Certified Associate)

13. Certified Information Systems Auditor
14. Java Certification (e.g., Sun Certified Java Associate)
15. Six Sigma
16. Microsoft Certified Solution Developer
17. Cisco Certified Network Associate
18. Database Administrator
19. Certified Public Accountant
20. Sap Certification
21. Vmware Certified
22. Cisco Certified Design Professional
23. Cisco Certified Voice Professional
24. Capability Model Maturity Integration Certification

SOURCE: Burning Glass Labor Insight

In a different approach to identifying in-demand skills, *Computerworld* polled 353 IT executives about their hiring plans for 2012 (see Table 10 on page 10). The results show that U.S. companies plan to invest in their IT workforces through summer 2012. Nearly 29 percent of respondents plan to hire new staff.⁹ The survey also identified new and emerging skills that employers are seeking.

According to responses from IT employers, increases in the skills in Table 10 are due in large part to those needed in the development of mobile applications for the health care industry.

Significantly, project management showed up in the survey report in Table 10 as well as job postings data in Table 9. This is an example of a non-tech management skill required by the IT sector. Job postings data can tell jobseekers which nontraditional skills and credentials employers require. IT employers also require skill in networking and business intelligence; this is influenced by the fact that IT is found across organizations, industries, and workplaces.

Similarly, data center and Web 2.0 skills also emerged in both the survey and the job postings data. These types of skills are needed to support the visualization and cloud strategies of organizations. Cloud computing is a general term for anything that involves delivering hosted services over the Internet. Using job postings data, industry survey data, and traditional LMI together provides a robust look at the IT sector.

Using job postings data, Tables 10, 11, and 12 show the specialized IT skills most in demand and the 10 non-technical skills requirements. As IT professionals struggle to keep their skills current in a rapidly evolving industry, educators face a similar challenge: ensuring that students receive the skills sought after in today's labor market. Having a clear understanding of the skills currently required by hiring employers helps educators provide students with those skills, increasing the employability of their students. Acting on this data will inform and lead to an alignment of curricula to market needs.

TABLE 10.
COMPUTERWORLD'S LISTING OF THE TOP TEN IT SKILLS, 2011

1. Programming and application development
2. Project management
3. Help desk and technical support
4. Networking
5. Business intelligence

6. Data center
7. Web 2.0
8. Security
9. Telecommunications
10. Collaboration architecture

SOURCE: *Computerworld*, 2010

TABLE 11.
TOP 20 SPECIALIZED IT SKILLS, ACCORDING TO JOB POSTINGS DATA, 2011

1. Oracle
2. SQL
3. Java
4. Software development
5. Sales
6. .Net
7. Linux
8. Information technology
9. Unix
10. Software engineering

11. Extensible Markup Language (XML)
12. Technical support
13. Microsoft C#
14. Javascript
15. SQL server
16. C++
17. Operating systems
18. Object-oriented analysis and design
19. Information systems
20. Systems engineering

SOURCE: Burning Glass Labor Insight

TABLE 12.
TOP 10 BASELINE (NON-TECHNICAL) SKILL REQUIREMENTS, ACCORDING TO JOB POSTINGS DATA, 2011

1. Communication skills
2. Writing
3. Customer service
4. Troubleshooting
5. Typing

6. Problem solving
7. Leadership
8. Research
9. Reports
10. Project management

SOURCE: Burning Glass Labor Insight

SUPPLEMENTAL REAL-TIME FIGURES

Table 13 lists employers with the greatest number of IT job postings in the United States. When analyzed at the state, county, or MSA level, these data are important for engaging employers and counseling students. Education and training institutions can use these data to inform strategies for job fairs, job referrals, and partnerships. Community colleges may also use the data as they recruit members for their employer advisory committees. Access to the data helps institutions objectively analyze what employers are asking for in terms of occupations, skills, credentials, and certifications.

TABLE 13.
IT JOB POSTINGS, TOP 20 EMPLOYERS, 2011

EMPLOYER	# OF JOB POSTINGS
Deloitte Development, LLC	11,519
IBM	9,227
Lockheed Martin Corporation	7,475
Hewlett-Packard	6,907
General Dynamics	6,715
Science Applications International Corporation	6,342
Computer Sciences Corporation	5,527
Northrop Grumman	5,396
Geebo	4,451
Amazon.com	3,982

SOURCE: Burning Glass Labor Insight

EMPLOYER	# OF JOB POSTINGS
CACI	3,866
Staples	3,261
L3 Communications Holding Incorporated	3,260
Collabera, Inc.	3,250
Raytheon	3,231
Dell	3,110
BAE Systems	2,956
Booz Allen Hamilton, Inc.	2,886
Microsoft Corporation	2,629
JP Morgan Chase Company	2,298

Table 14 (on page 13) shows the titles most frequently found in job postings. These data are important for jobseekers: They reveal the actual titles that employers use in postings, which may differ from traditional BLS occupational titles and those found in the names of education and training programs. Access to these data can improve career counseling and job referrals. Some unexpected job titles in Table 14 are .Net developer, Oracle database administrator, Sharepoint developer, and Java developer.

TABLE 14.
IT JOB POSTINGS, TOP 20 JOB TITLES, 2011

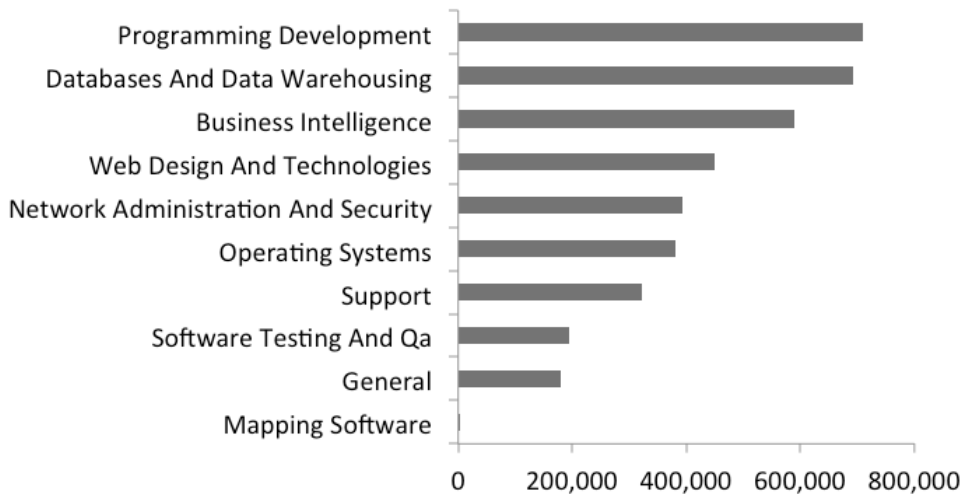
DESCRIPTION	JOB OPENINGS
Software engineer	108,169
Systems engineer	54,150
Java developer	37,205
Systems administrator	37,197
Network engineer	28,326
Software developer	28,281
Systems analyst	28,085
.Net developer	27,213
Database administrator	24,155
Programmer/analyst	21,858
Application developer	19,148

SOURCE: Burning Glass Labor Insight

DESCRIPTION	JOB OPENINGS
Applications engineer	17,930
Graphic designer	16,600
Technical writer	16,587
Business systems analyst	16,147
Oracle database administrator	13,169
Network administrator	12,818
Senior Java developer	11,849
Senior systems engineer	11,223
Sharepoint developer	9,486
Information technology specialist	8,784

Figure 2 demonstrates job distribution by IT cluster. Most job postings in 2011 were in program development (708,470), databases and data warehousing (691,880), and business intelligence (588,389).

FIGURE 2.
NATIONAL IT SKILL CLUSTER JOB DISTRIBUTION, 2011



SOURCE: Burning Glass Labor Insight

Table 15 provides job postings by select IT occupations. Most job postings were for computer programmers (373,282), software developers (285,931), and computer systems analysts (194,189). Traditional LMI data demonstrate that although job postings data show a high number of postings for computer programmers, this occupation has experienced significant decline and may include many replacement workers. Five-year projections between 2011 and 2016 show a 2 percent decline. Computer support specialists also offer options for new IT workers with only an Associate's degree.

TABLE 15.
IT JOB POSTINGS, BY OCCUPATION, 2011

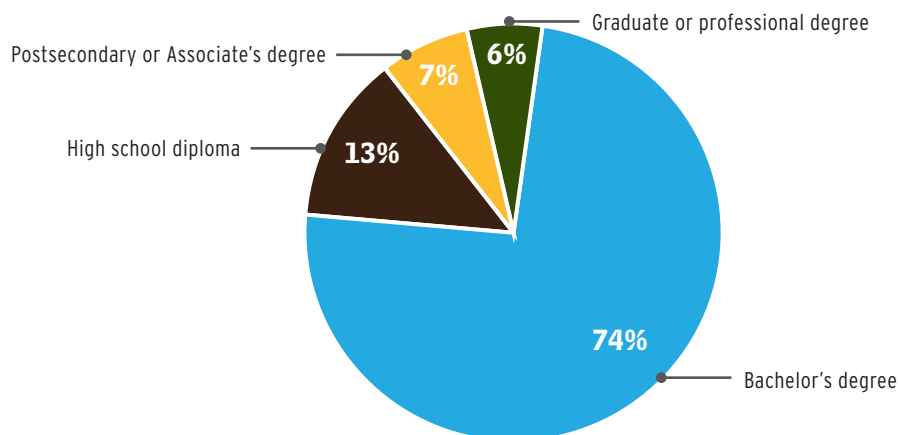
OCCUPATION	JOB OPENINGS
Computer programmers	374,282
Software developers, applications	285,931
Computer systems analysts	194,189
Network and computer systems administrators	120,271
Computer user support specialists	120,058
Software developers, systems software	109,625
Database administrators	102,878
Network systems and data communications analysts	69,083

OCCUPATION	JOB OPENINGS
Graphic designers	31,934
Technical writers	23,517
Computer and information systems managers	14,328
Multimedia artists and animators	9,604
Computer hardware engineers	7,217
Audio and video equipment technicians	7,108
Computer and information research scientists	1,775
Desktop publishers	1,225

SOURCE: Burning Glass Labor Insight

Job postings data support BLS data indicating a Bachelor's degree is essential for many of the IT occupations identified in this report (see *Figure 3*). A Bachelor's degree is required by 74 percent of all select IT occupations.

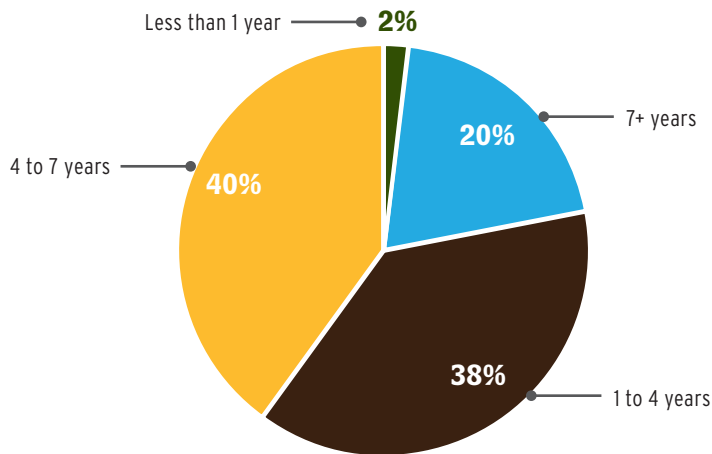
FIGURE 3.
ADVERTISED EDUCATIONAL REQUIREMENTS, SELECT IT OCCUPATIONS, 2011



SOURCE: Burning Glass Labor Insight

Real-time job posting data demonstrate that IT employers are seeking significant levels of education and experience (see *Figure 4*). The data demonstrate what we already know: Internships, externships, or co-ops are the on ramps to employment. These data tell education and training providers that they should include a job-experience component in their IT training programs. More than one-third of select IT employers (38 percent) required one to four years of experience; only 3 percent required less than one year of experience.

FIGURE 4.
ADVERTISED EXPERIENCE REQUIREMENTS, SELECT IT OCCUPATIONS, 2011

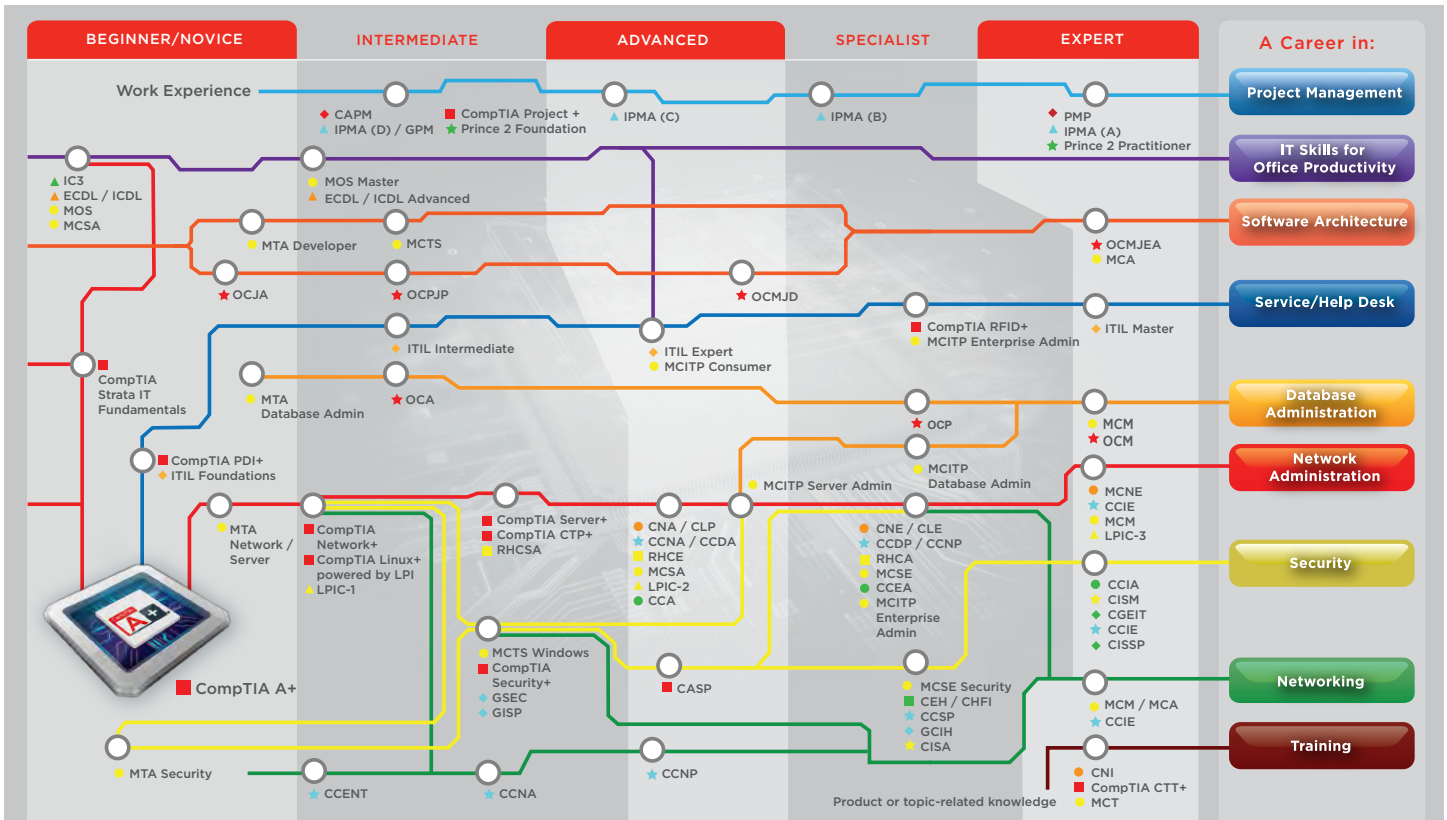


SOURCE: Burning Glass Labor Insight

CompTIA a leading provider of IT certifications developed an IT career roadmap that may be useful for individuals seeking to learn more about the IT sector. This is a sample career roadmap that supports information presented in Table 9 (on page 9) and Table 10 (on page 10).

CompTIA IT Certification Roadmap

<http://certification.comptia.org/certroadmap>



COMPTIA CERTIFICATIONS

CompTIA Strata
CompTIA A+
CompTIA Network+

CompTIA Server+
CompTIA Security+
CompTIA CTT+

CompTIA RFID+
CompTIA Linux+ Powered by LPI
CompTIA Project+

CompTIA PDI+
CompTIA CTP+
CASP (CompTIA Advanced Security Practitioner)

Certifications legend
continued on back



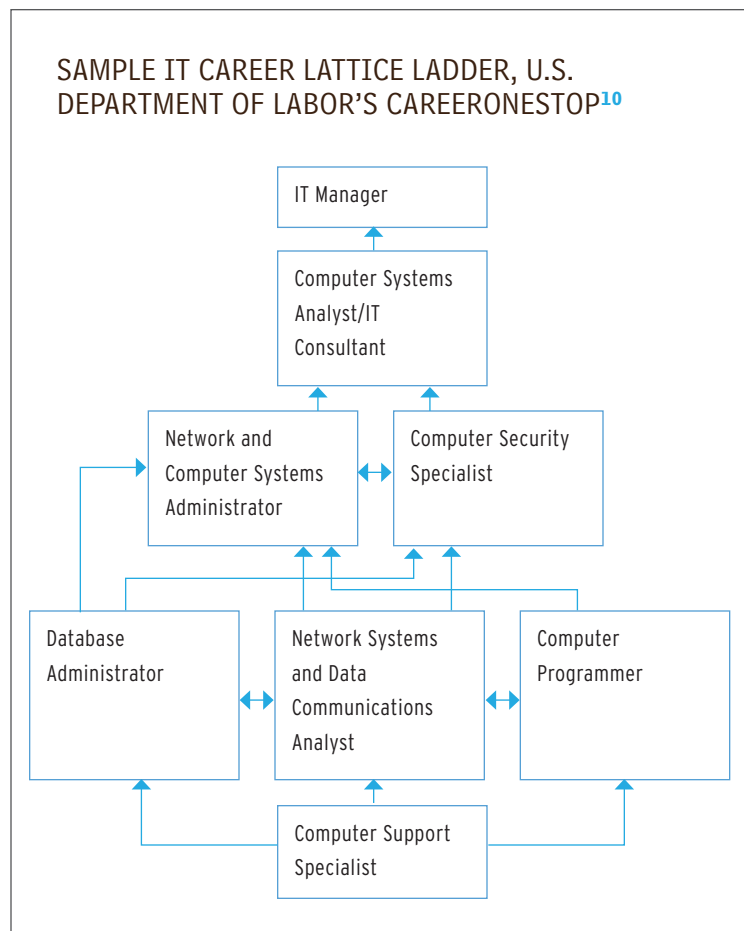
SOURCE: <http://certification.comptia.org/ExploreCareers/careerpaths.aspx>

SUMMARY AND CONCLUSION

If we are serious about eliminating poverty and moving unemployed and dislocated workers toward high-growth and high-wage occupations, then IT offers prospects for both jobseekers and training providers. As defined by this report, there were 4.8 million IT jobs in 2011 and 1,473,025 unduplicated job postings in the United States. According to BLS projections, IT occupations will grow faster than the average for all occupations. Moreover, they provide career ladders and promotion opportunities (see box, “Sample IT Career Lattice Ladder”). For example, with on-the-job training or education, a computer support specialist (Associate’s degree) can typically move to a network analyst or computer programming position. And IT occupations provide opportunities for low-income workers to enter pathways to a living wage. According to the BLS, the median wage in 2011 for select IT occupations was \$31.54. Wages were \$18.91 per hour at the 10th percentile in IT and \$52.27 per hour at the 90th percentile—all well above the national minimum wage of \$7.25.

JFF prepared this labor market assessment of the information technology sector to serve as a replicable model for the Innovators Network of 10 colleges that are piloting Credentials that Work. We encourage Network members to reproduce it for their regions and IT programs of study. We suggest that colleges include additional data from the Census Bureau’s Local Employment Dynamics and institutional student outcomes. Community colleges are an important vehicle for achieving American competitiveness and represent an affordable, accessible route for a wide spectrum of students to access further education leading to well-paying, high-demand jobs.

Labor market performance at the occupational level is complex to measure. Traditional labor market data (e.g.,



occupational employment and occupational projections) have limitations, including small sample sizes, simple projections methodologies, and occupational taxonomies that do not reflect new and emerging jobs. By incorporating multiple data sources, analyses such as this become richer and more likely to reflect nuances and respond to market shifts. This comprehensive array of labor market information—when interpreted by analysts, employers, IT professionals, and education and training professionals—should lead to a better understanding of labor market conditions.

Furthermore, we suggest that colleges in the Innovators Network, as well as others, analyze program completions data to gain insight into new supply of IT workers entering the market. This research has provided a look at the demand for IT workers before the recession and as it recedes. Colleges can get even greater results by also analyzing regional supply. By drawing on all these data sources, institutions are likely to capture current and projected labor market conditions—leading to better decisions.

A WORD OF CAUTION

Data consumers should be cautious when comparing information from various sources. Differences in aspects such as procedures, timing, and survey question phrasing can affect the comparability of results across data sources. However, taken together, these various data elements and sources offer a more robust information set and can be instructive for workforce planners and colleges. As always, we strongly recommend that conclusions of analysts be vetted with professionals in the field, HR professionals, and others that are close to the workings of the labor market.

APPENDIX: ABOUT REAL-TIME LABOR MARKET INFORMATION

The emergence of real-time labor market information is one of the most significant innovations for assessing labor market conditions today. Real-time LMI uses spidering technology to collect job postings by occupation, obtained daily from public and private labor exchanges (Internet job boards, company websites, and newspapers). Drawing actionable data from real-time job postings and analyzing it is complex; duplication of job openings occurs frequently and is not always easily detected. Moreover, the providers of real-time LMI are private vendors operating in competitive markets, and many of these firms keep their data-quality procedures confidential. This is in contrast to many traditional providers and sources of labor market information: government agencies that disclose their methodologies. This presents a challenge: users of any data source should be aware of the methodology for gathering the data, the strengths and limitations associated with the data, and the assumptions that go into producing reports and analysis.

Even with these limitations, real-time LMI provides valuable indications of supply and demand trends, emerging occupations, current and emerging skill requirements, and market-based demand for education and certifications. By drawing on current information and regular signals from the labor market, such data can improve the understanding of hiring trends, employer demand, and skill requirements.

ENDNOTES

¹ The BLS defines “grow much faster” than average as “employment projected to grow 20 percent or more.” Source: <http://www.bls.gov/oco/oco20016.htm>

² ManpowerGroup (<http://www.manpowergroup.com>) is a workforce company providing a range of talent-driven needs from recruitment and assessment, training and development, and career management, to outsourcing and workforce consulting. See: <http://press.manpower.com/press/2011/manpowergroup-annual-survey-shows-more-than-half-of-u-s-employers-cannot-find-the-right-talent-for-open-positions/>

³ For more information on Credentials that Work and the Innovators Network, see: <http://www.jff.org/projects/current/workforce/credentials-work/i222>

⁴ See, for example, “Transitioning to a Tech Job,” <http://www.cnbc.com/id/43769763> and “Top Two Reasons IT Projects Fail: Communication Skills and Business Understanding, Finds TEKsystems,” <http://www.teksystems.com/About-Teksystems/Press-Release-News-10254.aspx>

⁵ Sources: EMSI, IPEDS data.

⁶ See: <http://www.bls.gov/oco/ocos276.htm>

⁷ See: <http://www.economicmodeling.com/2011/08/19/the-it-tech-sectors-where-the-jobs-are>

⁸ Note that placement and staffing agency job postings occupations are placed in the administrative and support and waste management and remediation services industry.

⁹ Source: http://www.computerworld.com/s/article/358381/9_Hot_Skills_for_2012

¹⁰ Source: <http://careeronestop.org>



JOBS FOR THE FUTURE

TEL 617.728.4446 FAX 617.728.4857 info@jff.org

88 Broad Street, 8th Floor, Boston, MA 02110
122 C Street, NW, Suite 650, Washington, DC 20001

WWW.JFF.ORG

