Global Knowledge®

2020 IT Skills and Salary Report

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Introduction

Welcome to the Global Knowledge 2020 IT Skills and Salary Report. It is the largest worldwide study of professionals in the technology community and has been conducted annually since 2006. In this comprehensive report, you'll find worldwide data, as well as findings by region: North America; Latin America; Europe, the Middle East and Africa (EMEA); and the Asia-Pacific region.

IT professionals, human resources and industry leaders use this report as a guide for salaries, in-demand certifications, tech investment areas, skills gaps, professional development, job satisfaction, and future outlooks.

HOW TO USE THE IT SKILLS AND SALARY REPORT

The data in this report helps answer the following questions:

About salaries

- What are salaries for IT professionals?
- Which industries pay the best?
- What's driving raises and bonuses?

About certification

- Which certifications are most popular?
- Which certifications are associated with the highest salaries?
- What are the individual and organizational benefits of certification?
- What is the value of pursuing certification from multiple tech providers and bodies of knowledge?

From IT decision-makers

- What are the biggest challenges in IT?
- How many IT departments have a shortage of skills?
- What are the causes and impacts of skills gaps?
- How likely are they to promote training for their employees?

About professional development

- Why do IT professionals train?
- How do IT professionals prefer to learn?
- What are the primary reasons IT professionals don't train?

About job satisfaction

- What are the main reasons IT professionals change jobs?
- Does training impact job satisfaction?
- Are IT professionals worried about job security?

Looking forward

- Which technologies do organizations plan to invest in?
- Which tech providers will command the most investment?
- What is the impact of COVID-19 on IT?

PRIMARY FINDINGS

Opportunities exist for bigger paychecks

IT professionals don't lack opportunities to boost their pay. Learning a new skill or earning a certification can result in a raise upwards of $12,000 a year. Seeking a promotion to a management position can also pay off, as some decision-makers make over 25% more than the employees they manage.

More IT professionals are certified this year

Eighty-seven percent of IT professionals have at least one certification, while nearly 40% are already pursuing their next certification. After achieving a certification, IT professionals recognize the benefits immediately, including an increase in work quality, more engagement with their work, and faster job performance.

Cloud and cybersecurity certifications are top-paying

Universally, cloud computing and cybersecurity certifications are associated with the highest IT salaries around the world. Credentials from ISACA, (ISC)[2], AWS and Google Cloud are amongst the top-paying. Cloud and IT security skills are also the most in-demand, as IT decision-makers continue to struggle to hire in these areas.

Skills gaps are stable, but still a significant problem

For the first time since 2016, the percentage of IT skills gaps did not rise year over year. And yet, over 75% of IT decision-makers are dealing with skills gaps. The loss in productivity due to skills gaps can equal 520 hours and $29,000 per employee. Yikes.

Training support is on the upswing

Over 90% of our survey respondents trained in the past year—up seven percent from 2019. This may be due to an increase in manager support. When authorized by the organization, 80% of IT decision-makers approved training for their staff, an improvement of 36% from a year ago.

Workloads are major challenges for both managers and their staff

The amount of day-to-day work for the average IT professional is untenable. It's also exacerbated by skills gaps and unfilled positions on their team. Increasing workloads cause undue stress on employees, which is a problem because an overwhelming number of unsatisfied IT professionals are likely to seek a job change.

IT professionals are leaving dead-end jobs

Job satisfaction is important for tech professionals, as 90% who are dissatisfied will pursue a new job this year. Our survey respondents will not wait out a bad situation. They are eager to grow their careers and will change employers if they don't feel supported.

Microsoft is the top tech focus area

Over half of global IT decision-makers say they expect their organization to invest in Microsoft technology this year. This is the second straight year Microsoft tops the list. AWS and Cisco are also primary technologies for over 30% of organizations.

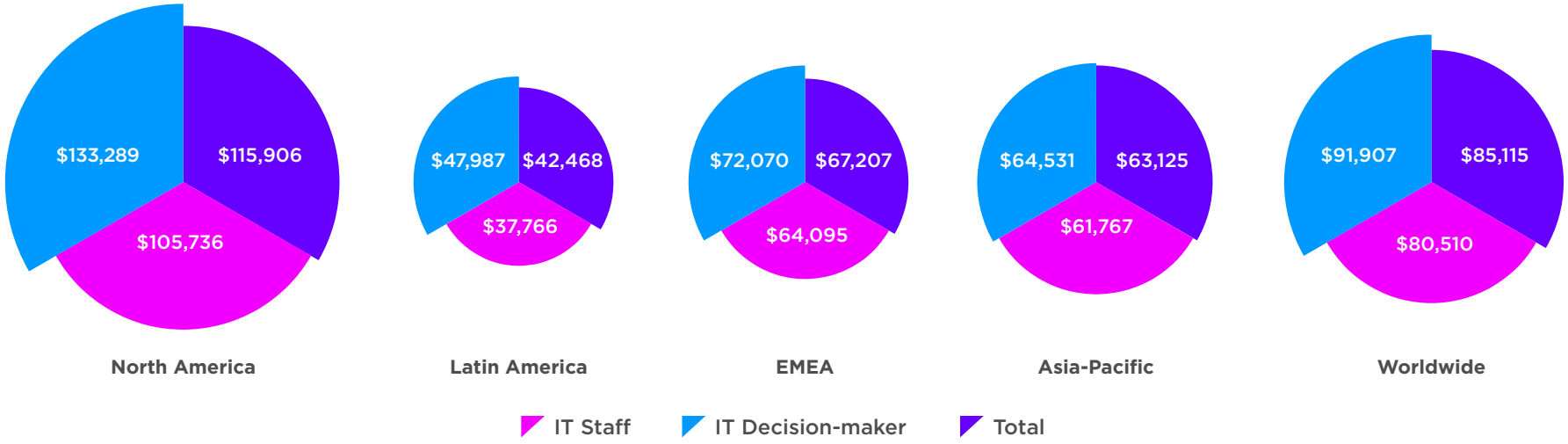
Salary

An individual's salary is determined by a combination of factors, including education, responsibility level, job role, certification, tenure, industry, company size and location. In the 2020 IT Skills and Salary Survey, we asked respondents about these factors and discovered variations around the globe, starting with base salaries. Participants were required to convert their salaries into U.S. dollars while taking the survey to enable relevant comparisons.

BASE SALARY

The average annual salary for global IT professionals is $85,115.

North American IT professionals earn $115,906 annually, which is 36% higher than the worldwide average. The U.S. average salary is $120,491. By region, EMEA is second in average salary ($67,207), followed by Asia-Pacific ($63,125) and Latin America ($42,468). Compared to 2019, wages are marginally up in North America and Latin America, and slightly down in EMEA and Asia-Pacific.



Another variance between all regions is the salary discrepancy between decision-makers and the employees they manage. The largest salary gap between managers and staff is in Latin America (27%) and North America (26%), while decision-makers in Asia-Pacific only earn four percent more than their employees.

RAISES AND BONUSES

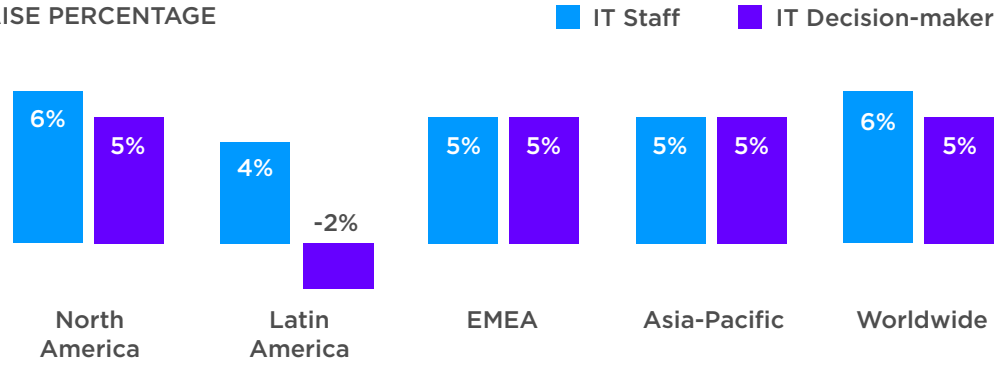
Nearly 60% of IT professionals received a raise in the past year. Raise percentages were consistent across all regions—four to six percent. The only outlier is decision-makers in Latin America whose salaries, on average, dropped two percent year over year.

Reasons for a raise

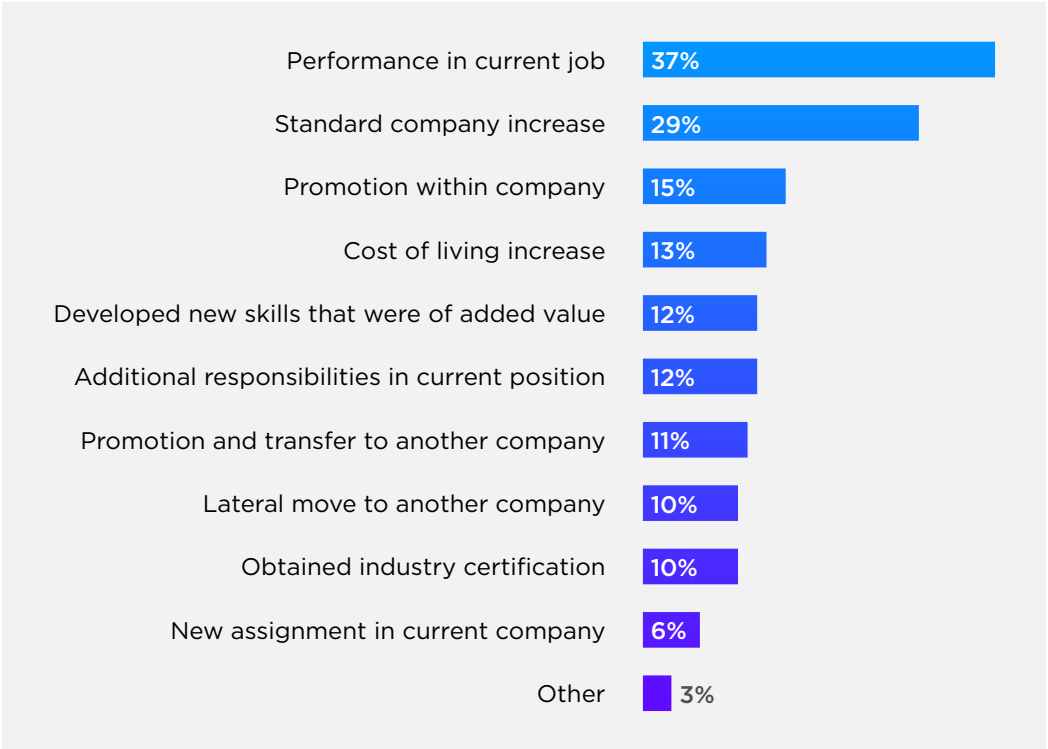
Thirty-seven percent of IT professionals who received a raise attribute it to job performance, while nearly 30% received a pay bump as part of a standard company increase. Fifteen percent saw their salary increase as part of a promotion.

The reason for a raise impacts the amount of the raise. Twelve percent of individuals who received a raise attribute it to new skills—those same respondents earned nearly $12,000 more this year. IT professionals who obtained a new certification saw their salary increase nearly $13,000. Both of these numbers are strong indications that training pays off.

RAISE PERCENTAGE

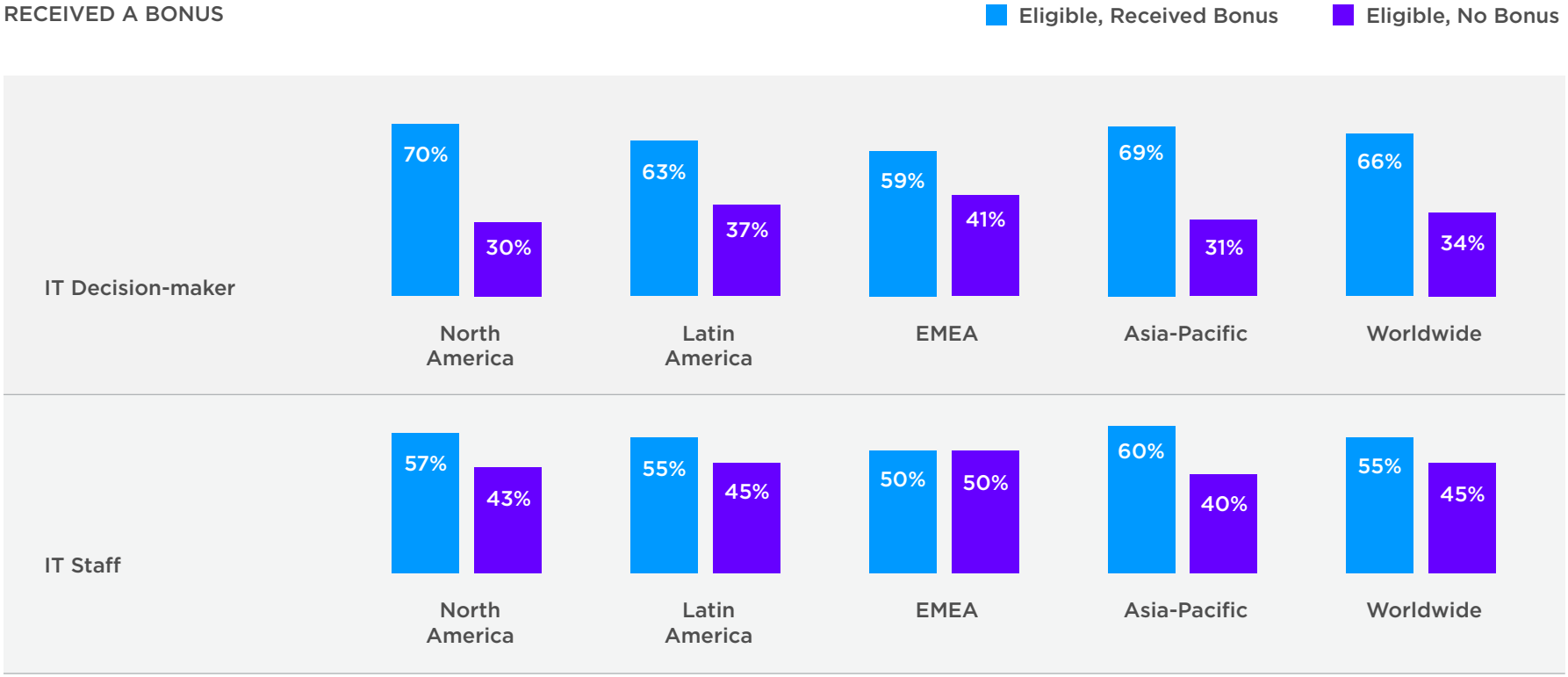


FACTORS FOR INCREASED SALARY



Received a bonus

Worldwide, 66% of eligible decision-makers and 55% of staff earned a bonus this year—both are up noticeably from 2019. In North America, 70% of decision-makers and 57% of staff received bonuses. EMEA had the lowest numbers in this category, as only half of the eligible staff received a bonus.



RESPONSIBILITY LEVEL

We compared respondents' compensation data to their levels of responsibility, ranging from non-management to executive.

Non-management IT staff (specialists, analysts, associates, level 1, etc.) account for 60% of this report. Average non-management salaries range from $37,766 in Latin America to $105,736 in North America, with a worldwide average of $80,510.

Popular job roles:

- Cloud architect
- Network engineer
- IT auditor

Mid-level professionals (managers and team leads) make up one-quarter of our respondent base. The average salary for these professionals is $79,180, which strangely is lower than the worldwide average for non-managers. Mid-level pros earn $115,599 annually in North America.

Popular job roles:

- Project manager
- Information security
- Infrastructure manager

Senior-level professionals account for 13% of this year's report. The average salary at this level is $108,576. Senior-level pros in North America earn $152,924, while those in EMEA make $82,083 a year.

Popular job roles:

- Director
- Chief Security Officer (CSO)
- Program manager

Executives make up the smallest portion of our report—two percent. These organizational leaders earn $143,397 worldwide, $119,197 in the Asia-Pacific region and over $200,000 in North America.

Popular job roles:

- Chief Executive Officer (CEO)
- Chief Information Officer (CIO)
- Chief Technology Officer (CTO)

SALARY BY RESPONSIBILITY LEVEL

Level	Average	Count	Percent
North America			
Non-management	$105,736	2,480	63
Mid	$115,599	870	22
Senior	$152,924	498	13
Executive	$201,735	82	2
Total	$115,906	3,930	100%
Latin America			
Non-management	$37,766	304	54
Mid	$45,838	167	30
Senior	$49,154	73	13
Executive	$62,398	19	3
Total	$42,468	563	100%
EMEA			
Non-management	$64,095	1,989	61
Mid	$64,090	799	25
Senior	$82,083	382	12
Executive	$110,138	67	2
Total	$67,207	3,237	100%
Asia-Pacific			
Non-management	$61,767	903	51
Mid	$55,107	584	33
Senior	$77,572	246	14
Executive	$119,197	42	2
Total	$63,125	1,775	100%
Worldwide			
Non-management	$80,510	5,676	60
Mid	$79,180	2,420	25
Senior	$108,576	1,199	13
Executive	$143,397	210	2
Total	$85,115	9,505	100%

CAREER EXPERIENCE

Unsurprisingly, more tenured IT professionals have the highest salaries. Those with 26 or more years of experience earn $120,098 a year—that's more than double the average salary for first-year IT professionals.

In North America, IT professionals cross the $100,000 threshold in years 11 to 15. The most tenured earn almost $140,000 a year.

Among our respondents, the highest percentage has between six and 15 years of experience. Only one percent are in their first year, while 13% have worked in tech for over a quarter of a century.

CAREER EXPERIENCE

YEARS	NORTH AMERICA		LATIN AMERICA		EMEA		ASIA-PACIFIC		WORLDWIDE	
	Average	Percentage	Average	Percentage	Average	Percentage	Average	Percentage	Average	Percentage
< 1	$63,274	1%	$22,256	1%	$39,578	2%	$56,247	1%	$51,301	1%
1-5	$82,799	13%	$32,808	15%	$45,227	15%	$52,342	14%	$60,091	14%
6-10	$98,802	16%	$36,165	29%	$56,561	22%	$43,887	26%	$65,525	21%
11-15	$113,402	18%	$42,670	23%	$67,325	22%	$56,537	25%	$79,483	21%
16-20	$121,941	18%	$53,040	17%	$74,415	18%	$80,669	18%	$94,199	18%
21-25	$135,983	16%	$57,709	9%	$86,060	11%	$90,719	8%	$111,116	12%
26+	$137,920	18%	$46,251	6%	$95,034	10%	$100,449	8%	$120,098	13%

JOB FUNCTION

Salaries vary considerably by job function. The following functional areas make up nearly two-thirds of this year's respondent base:

- Infrastructure, Networking and Telecommunications (20%)
- Audit / IT Compliance (16%)
- Cybersecurity / IT Security (13%)
- IT Architecture and Design (11%)

SALARY BY JOB FUNCTION

FUNCTIONAL AREA	NORTH AMERICA		LATIN AMERICA		EMEA		ASIA-PACIFIC		WORLDWIDE		
	Average	Respondents	Average	Respondents	Average	Respondents	Average	Respondents	Average	Respondents	Total
Application Development / Programming	$110,234	146	$35,006	28	$62,170	147	$44,110	82	$74,021	403	4%
Audit / IT Compliance	$115,308	726	$46,428	66	$67,985	389	$62,620	324	$88,713	1,505	16%
Business Analysis	$94,445	65	$31,800	5	$74,095	26	$70,092	11	$84,069	107	1%
Business Operations	$101,328	32	$42,833	3	$73,088	28	$62,169	13	$81,916	76	1%
Cloud Computing	$153,655	161	$43,802	30	$85,140	164	$75,755	89	$105,310	444	5%
Cybersecurity / IT Security	$128,726	554	$41,662	56	$74,004	359	$74,886	300	$96,675	1,269	13%
Data, Analytics and Business Intelligence	$111,132	93	$40,342	21	$64,663	89	$55,844	41	$78,799	244	2%
DevOps	$114,361	52	$31,677	9	$62,854	72	$52,510	38	$74,578	171	2%
Executive (C-level, VP, or Director)	$161,483	214	$56,204	24	$105,105	93	$106,078	52	$133,674	383	4%
IT Architecture and Design	$128,441	321	$43,610	72	$73,215	489	$85,767	170	$85,705	1,052	11%
Infrastructure, Networking and Telecom	$94,650	662	$36,162	151	$53,803	732	$48,737	334	$65,876	1,879	20%
Other	$105,657	215	$35,350	23	$63,577	180	$68,420	80	$81,218	498	5%
Project and Program Management	$122,529	159	$73,935	12	$73,112	102	$75,525	67	$96,726	340	4%
Risk Management	$131,195	176	$59,906	16	$89,328	98	$73,888	76	$104,969	366	4%
Sales and Marketing	$153,664	83	$62,647	24	$83,498	85	$70,939	22	$107,082	214	2%
Service Desk and IT Support	$64,567	271	$29,850	23	$40,579	184	$47,030	76	$52,753	554	6%
Total	$115,906	3,930	$42,468	563	$67,207	3,237	$63,125	1,775	$85,115	9,505	100%

Aside from executives, the highest global salaries belong to IT professionals who work in sales and marketing ($107,082), followed closely by cloud computing ($105,310) and risk management ($104,969).

Global Knowledge's Global Product Director for Cybersecurity Brad Puckett isn't surprised to see high-risk management salaries, as the demand for this particular skill set is growing.

"Managing risk is the single greatest cybersecurity goal among highly vulnerable business sectors, specifically finance, banking, retail, healthcare, and supply chain management," Puckett said. "Salaries continue to rise for professionals who can adequately display competencies in this skill."

Cloud professionals in the U.S. and Canada earn 33% more than the North American average and 24% more than the worldwide average.

For the second straight year, the most popular job role amongst all survey respondents is network engineer/analyst/technician, making up six percent of our total base.

INDUSTRY

IT professionals who work in the pharmaceutical, medical and biotech industry earn the highest global salaries at $113,031 annually while IT software professionals earn the most in the U.S. and Canada ($141,258).

The top-paying industry in Latin America (with a minimum of 10 respondents) and EMEA is insurance, real estate and legal, while the highest salaries in Asia-Pacific are in government: military and homeland security.

The most popular industry is IT consulting, making up nearly 20% of our worldwide respondents.

SALARY BY INDUSTRY

INDUSTRY	NORTH AMERICA		LATIN AMERICA		EMEA		ASIA-PACIFIC		WORLDWIDE	
	Average	Respondents	Average	Respondents	Average	Respondents	Average	Respondents	Average	Respondents
Accounting, auditing, banking and finance	$122,448	606	$43,034	79	$73,779	484	$66,701	340	$90,119	1,509
Aerospace and defense	$114,845	84	$22,684	2	$80,396	33	$71,467	13	$100,564	132
Automotive	$99,684	28	$23,694	2	$65,822	31	$34,153	9	$74,092	70
Communications, public relations and advertising	$115,762	21	$22,000	1	$77,786	19	$66,349	12	$89,191	53
Construction, architecture and engineering	$85,850	39	$80,000	4	$63,690	43	$103,110	11	$77,743	97
Education service	$86,008	184	$24,606	8	$50,720	86	$63,943	28	$72,466	306
Government: Military and homeland security	$110,225	146	$35,000	2	$63,790	34	$118,284	12	$101,810	194
Government: Non-defense, state and local	$100,749	292	$37,692	19	$64,455	130	$79,340	52	$86,490	493
Healthcare	$113,979	316	$29,006	15	$65,691	79	$77,435	46	$99,132	456
Hospitality, travel and recreation	$116,152	50	$32,400	2	$65,821	15	$65,033	11	$97,116	78
IT consulting	$120,673	495	$41,962	167	$65,502	831	$54,504	382	$75,730	1,875
IT hardware	$108,545	75	$35,576	19	$59,182	99	$65,817	56	$73,741	249
IT software	$141,258	328	$47,589	43	$73,972	282	$57,985	227	$93,639	880
Insurance, real estate and legal	$115,336	213	$56,282	13	$81,966	80	$77,709	71	$99,132	377
Manufacturing: Consumer and industrial	$112,814	177	$41,347	13	$79,769	113	$54,344	85	$87,986	388
Media, film and music	$117,067	35	$112,500	2	$64,601	24	$59,258	19	$87,484	80
Natural resources: Agriculture, forestry and fishing	$88,436	11	-	-	$42,624	3	$86,187	3	$79,955	17
Natural resources: Mining, oil and gas	$114,720	41	$44,509	9	$61,895	43	$62,171	22	$79,421	115
Nonprofit	$103,768	31	$105,333	3	$59,637	32	$58,341	9	$79,550	75
Other	$119,310	200	$35,325	20	$64,275	161	$58,056	67	$86,622	448
Pharmaceutical, medical and biotech	$128,780	52	$40,000	1	$90,089	16	$78,587	11	$113,031	80
Professional business services	$118,515	84	$33,751	9	$66,631	65	$78,823	43	$89,450	201
Retail	$116,777	88	$48,058	14	$75,349	64	$68,213	22	$91,873	188
System integrators (SI) and VARs	$137,935	60	$42,675	26	$62,006	142	$54,469	74	$73,580	302
Telecommunications	$104,587	150	$42,535	83	$55,327	254	$61,872	123	$67,019	610
Transportation and public utilities	$109,588	107	$42,930	6	$70,331	58	$81,048	22	$92,465	193
Wholesale	$100,905	17	$30,750	1	$62,021	16	$87,545	5	$81,441	39

WOMEN IN TECH

Fourteen percent of our survey respondents this year are women. Forty percent are IT decision-makers, which is the same percentage as male decision-makers, even though the women in our survey tend to be earlier in their careers. Forty-four percent have 10 or fewer years of career experience, compared to 35% of men.

Job roles

Over 40% work in two main job functions: audit/IT compliance and cybersecurity. Twenty-one percent of women IT professionals list their job roles as either IT audit manager of IT auditor. Another seven percent are IT compliance specialists or managers. Three percent work in information security and two percent are a security manager or director.

Salary

A significant shift from 2019 is womens' salaries. The average salary for a female tech professional is $91,373, which is an eight percent increase year over year.

Also of note, female IT professionals have higher average salaries than their male counterparts—nine percent higher, to be exact. In 2019, women earned six percent less than men.

Job function is likely a contributor to higher salaries. While our female respondents predominantly work in auditing and cybersecurity this year, a higher percentage of men work in infrastructure, networking and communications, which has an average salary 27% less than auditing/compliance and 32% less than cybersecurity.

Certifications

Of the women we surveyed, 86% have at least one certification, which is mostly in line with our overall numbers. Since their job roles and functions differ from men, the certificates they pursue also vary.

The CISA certification is the most popular certification for women in IT and the third most popular among all respondents.

Another major variation regards Project Management Professional (PMP®). It is the third most-held certification among women, while it's the 14th most-held by men.

JOB ROLES HELD BY WOMEN IN IT

IT audit manager	11%
IT auditor	10%
IT compliance specialist	4%
IT compliance manager	3%
Information security	3%
Security manager / director	2%
Director	2%
Network engineer / analyst / technician	2%
Project manager	2%
Technical support	2%

CERTIFICATIONS HELD BY WOMEN IN IT

CISA - Certified Information Systems Auditor	194
ITIL® Foundation	180
PMP® : Project Management Professional	72
CISM - Certified Information Security Manager	72
CRISC - Certified in Risk and Information Systems Control	63
CCNA Routing and Switching	51
CompTIA A+	35
CompTIA Security+	33
CISSP - Certified Information Systems Security Professional	30
CompTIA Network+	29
GCP Cloud Architect	26
CCNP Routing and Switching	24
AWS Certified Cloud Practitioner	19
GCP Data Engineer	18
Six Sigma Green Belt	17

U.S. SALARIES

IT professionals in the U.S. have an average annual salary of $120,491. U.S. decision-makers earn $138,200 a year.

While tenure, job function and industry affect pay, geography is also a major salary influencer. The cost of living in the Mid-Atlantic or New England, for example, is higher than the Midwest.

Washington, D.C. has the highest IT salaries in the country at $151,896—a 19% increase from 2019. New Jersey, California, Maryland and New York round out the top five U.S. salaries by state. California had the highest U.S. salaries in 2019.

South Dakota has the lowest average salary ($61,867) this year.

SALARY BY STATE

State	Average
Alabama	$101,647
Alaska	$127,250
Arizona	$112,981
Arkansas	$111,142
California	$138,941
Colorado	$115,352
Connecticut	$132,122
Delaware	$119,375
District of Columbia	$151,896
Florida	$112,316
Georgia	$119,423
Hawaii	$87,824
Idaho	$102,773
Illinois	$124,258
Indiana	$104,586
Iowa	$106,737
Kansas	$112,970
Kentucky	$99,716

State	Average
Louisiana	$89,079
Maine	$98,288
Maryland	$134,814
Massachusetts	$132,739
Michigan	$110,991
Minnesota	$119,007
Mississippi	$84,570
Missouri	$104,950
Montana	$98,333
Nebraska	$102,411
Nevada	$101,942
New Hampshire	$121,321
New Jersey	$145,688
New Mexico	$83,425
New York	$133,745
North Carolina	$112,161
North Dakota	$97,250
Ohio	$113,898

State	Average
Oklahoma	$97,964
Oregon	$114,883
Other U.S. territories	$55,000
Pennsylvania	$116,260
Puerto Rico (U.S. territory)	$75,100
Rhode Island	$117,158
South Carolina	$97,240
South Dakota	$61,867
Tennessee	$108,876
Texas	$122,122
Utah	$110,411
Vermont	$119,060
Virginia	$131,007
Washington	$121,722
West Virginia	$124,079
Wisconsin	$111,931
Wyoming	$89,055

CANADIAN SALARIES

The average annual salary in Canada is $77,580. IT professionals in British Columbia have the highest average salaries in the country at $85,801. The other top-paying Canadian provinces by salary are Quebec ($81,573), Ontario ($78,887), Alberta ($78,040) and Saskatchewan ($70,811).

Provinces with fewer than 10 respondents were omitted from the list.

SALARY BY PROVINCE

Province	Average
Alberta	$78,040
British Columbia	$85,801
Manitoba	$65,803
New Brunswick	$52,254
Nova Scotia	$63,246
Ontario	$78,887
Quebec	$81,573
Saskatchewan	$70,811

EUROPEAN SALARIES

For the second straight year, Switzerland dominates European salaries with an annual average of $133,344. The average annual IT salary in Europe is $71,796.

Germany has the second-highest salary at $88,195. Rounding out the top five is Ireland ($87,154), Belgium ($85,899) and the United Kingdom ($82,792).

European countries with fewer than 30 respondents were omitted from the list.

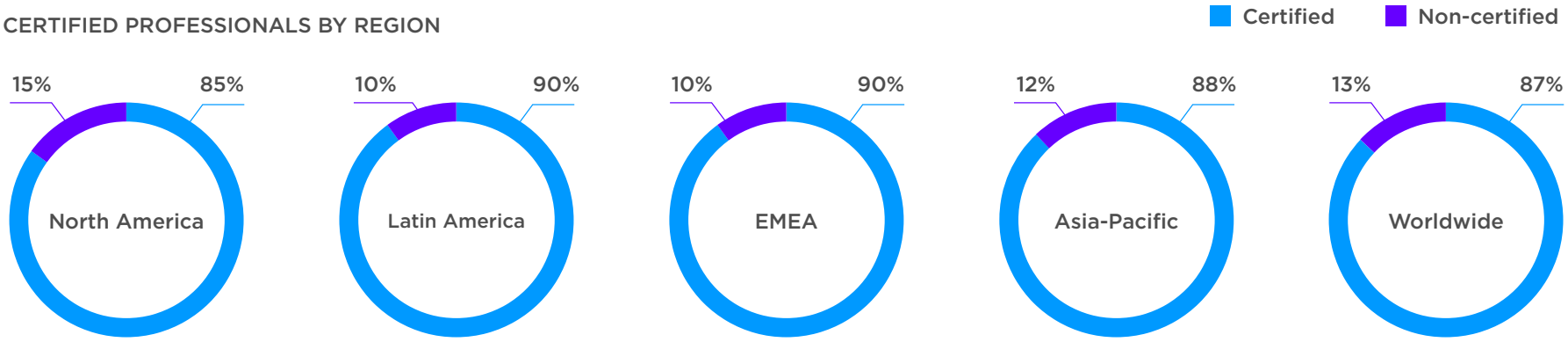
SALARY BY EUROPEAN COUNTRY

Country	Average
Belgium	$85,899
Czech Republic	$49,926
Finland	$81,080
France	$70,753
Germany	$88,195
Greece	$37,101
Hungary	$36,611
Ireland	$87,154
Italy	$51,324
Netherlands	$76,989
Norway	$79,759
Poland	$41,554
Portugal	$44,408
Romania	$37,943
Spain	$54,718
Sweden	$65,917
Switzerland	$133,344
United Kingdom	$82,792

Certifications

Eighty-seven percent of IT professionals hold at least one certification, up from 85% in 2019 and just behind the all-time high of 89% in 2018. Latin America and EMEA have the highest percentage of certified professionals (90%), while North America is below the global average for the second year in a row.

CERTIFIED PROFESSIONALS BY REGION



Nearly 40% of certified IT professionals earned their most recent certification in the last six months, while a similar number are already pursuing their next certification at the time of the survey.

It'll be interesting to see how these numbers fluctuate in our 2021 report as the COVID-19 pandemic may delay certification plans this year.

INDIVIDUAL BENEFITS OF CERTIFICATION

A majority of certified IT professionals experience two main certification benefits: better job performance and higher salaries. (Note: For organizational benefits of certification, see the IT Decision-Maker Insights section of this report)

After training to achieve an IT certification, over half of IT professionals said the quality of their work has improved, while one-third find their work more engaging post-certification. Another 15% say they now make fewer errors.

IT professionals tend to be more effective in their jobs after certification because of the training investment required. Especially with hands-on training, individuals can learn new skills that easily translate to the workplace. These same people make an immediate and meaningful impact in their job, which is why nearly 20% either received a raise or a promotion after getting certified.

An IT certification indicates to employers that an individual is willing to invest a significant amount of time to build important skills. Our respondents also said a certification can help earn the trust of customers.

As for salaries, IT professionals on average earn more than non-certified peers. The biggest discrepancy is in North America, where the salaries of certified professionals are eight percent higher than those with no certifications.

JOB EFFECTIVENESS AFTER CERTIFICATION TRAINING

And the more certifications someone holds, the higher their average salary. An IT professional who has six or more career certifications makes $91,643 a year—eight percent more than the worldwide average. In North America, someone with six or more certifications earns $13,000 more than someone with one certification.

CERTIFICATION CATEGORIES

While cybersecurity certifications are the most popular, cloud computing credentials are associated with the highest salaries. AWS and Google Cloud certainly influence these numbers, as each have some of the top-paying certifications in the world. In North America, Google Cloud certifications are associated with an average salary of $161,484.

Worldwide, enterprise architecture certifications (e.g., TOGAF®) are linked with the top average salary ($107,827). Project management, agile and scrum certifications also have global averages north of $100,000 a year.

Over half of our survey respondents have at least one cybersecurity certification, making it by far the most popular category in 2020. Cisco is second (22%) and Microsoft is third (21%).

SALARY BY CERTIFICATION CATEGORY

CERTIFICATION CATEGORY	NORTH AMERICA		LATIN AMERICA		EMEA		ASIA-PACIFIC		TOTAL	
	Average	Count	Average	Count	Average	Count	Average	Count	Average	Count
Amazon Web Services (AWS)	$138,640	215	$42,801	44	$86,644	190	$69,449	150	$97,781	599
Application development and programming	$139,231	55	$21,518	1	$76,070	75	$61,948	45	$91,887	176
Avaya	$110,789	19	$33,375	4	$63,964	11	$35,092	10	$74,841	44
Blockchain	$131,000	4	$41,750	4	$80,895	19	$54,547	13	$73,428	40
Business analysis	$113,705	39	$50,000	5	$76,733	42	$72,187	30	$86,835	116
Business process	$129,960	84	$48,069	7	$79,700	62	$80,562	48	$99,808	201
Cisco	$101,709	668	$36,335	178	$55,343	887	$55,386	360	$68,532	2,093
Citrix	$110,918	228	$39,517	59	$62,756	359	$50,992	140	$72,887	786
Cloud Credential Council	$168,250	4	$36,000	1	$91,250	4	$70,222	9	$94,778	18
CompTIA	$93,786	561	$34,259	25	$59,238	157	$77,260	55	$83,985	798
CWNP	$119,605	33	$37,269	7	$56,790	10	$102,778	9	$96,623	59
Cybersecurity	$122,317	2,150	$41,729	264	$71,598	1,504	$71,248	966	$92,242	4,884
Data center	$142,243	36	$36,959	8	$67,652	50	$68,785	27	$88,068	121
Database	$131,584	48	$46,790	16	$72,256	97	$74,681	55	$84,171	216
Dell EMC	$119,037	57	$65,768	9	$62,211	78	$54,230	19	$81,348	163
DevOps	$131,100	10	$36,185	7	$125,245	20	$67,020	18	$95,919	55
Enteprise architecture	$149,838	37	$69,315	10	$101,046	80	$87,607	31	$107,827	158
Google Cloud	$161,484	190	$49,593	41	$85,043	210	$70,867	139	$104,181	580
Help desk	$101,069	30	$21,000	3	$54,871	11	$37,972	10	$75,525	54
HP	$114,192	52	$36,990	13	$52,034	104	$55,429	26	$68,059	195
IBM	$126,845	63	$40,028	23	$61,460	79	$56,657	45	$77,699	210
ITIL and IT service management	$120,617	499	$43,059	114	$70,195	676	$67,691	392	$82,738	1,681
Juniper Networks	$120,557	29	$40,461	19	$57,135	75	$42,607	41	$62,786	164
Microsoft	$105,808	728	$40,118	103	$66,745	847	$61,531	345	$78,557	2,023
Nutanix	$125,904	83	$49,424	46	$64,909	127	$55,834	29	$79,250	285
Other	$120,294	573	$37,324	72	$68,844	366	$62,283	200	$90,231	1,211
Project management, agile and scrum	$132,363	310	$52,318	36	$83,182	299	$83,191	156	$100,830	801
Red Hat / Linux	$119,307	52	$51,029	22	$67,521	96	$56,104	67	$74,125	237
Veeam	$129,427	37	$54,576	15	$64,439	85	$32,401	9	$77,920	146
VMware	$120,839	207	$41,671	48	$67,022	299	$61,630	116	$80,899	670
Web development	$98,529	31	$21,518	1	$78,058	15	$65,600	10	$86,014	57
Wireless	$121,904	41	$29,844	6	$60,445	38	$84,202	15	$87,371	100
Wireshark	$129,408	16	$41,699	4	$75,450	21	$37,028	8	$84,041	49

TOP-PAYING CERTIFICATIONS

We've established that a higher-than-average salary is just one of many certification benefits. So which IT certifications are associated with the highest pay?

Keep in mind that 77% of certified IT professionals hold more than one certification. The salaries indicated on the ensuing lists are not indicative of achieving one certification. They are a culmination of several factors, including relevant skills, job role, tenure, geography and dedication.

North America

Cloud computing and cybersecurity make up the five highest-paying certifications in the U.S. and Canada. Google Certified Professional Cloud Architect and ISACA's Certified Information Security Manager (CISM) are numbers one and two for the second straight year. (Note: For U.S. data only, here's the 15 Top-Paying IT Certifications for 2020.)

Two other ISACA certifications crack the top 10, with Certified in Risk and Information Systems Control (CRISC) ranking fourth and Certified Information Systems Auditor (CISA) coming in eighth.

"The top-tier cybersecurity certifications validate professionals for jobs in cybersecurity senior leadership positions, which are among the highest in-demand," Brad Puckett said. "Cybersecurity leaders who possess accreditation in the proper areas can demand salaries that tend to drive the averages higher due to a lack of inventory of these professionals available."

AWS Certified Solutions Architect – Associate has the third-highest North American salary, up one spot from last year. AWS Certified Cloud Practitioner, which didn't make this list in 2019, ranks seventh ($128,620).

Microsoft Certified: Azure Administrator Associate also makes its debut, coming in 10th.

To be included in the list, a certification must have had at least 75 North American responses.

TOP-PAYING CERTIFICATIONS NORTH AMERICA

Certification	Average	Count
Google Certified Professional Cloud Architect	$169,611	127
CISM - Certified Information Security Manager	$142,585	252
AWS Certified Solutions Architect - Associate	$142,191	141
CRISC - Certified in Risk and Information Systems Control	$141,172	170
CISSP - Certified Information Systems Security Professional	$138,647	203
PMP®: Project Management Professional	$136,236	191
AWS Certified Cloud Practitioner	$128,620	87
CISA - Certified Information Systems Auditor	$128,086	404
VCP6-DCV: VMware Certified Professional 6 - Data Center Virtualization	$125,918	81
Microsoft Certified: Azure Administrator Associate	$122,768	79
CCA-N: Citrix Certified Associate - Networking	$122,313	80
ITIL® Foundation	$120,228	474
Microsoft Certified: Azure Fundamentals	$119,030	92
CCP-V: Citrix Certified Professional - Virtualization	$115,676	79
CCNP Routing and Switching	$113,052	166

Latin America

Project Management Professional (PMP®), which is administered by the Project Management Institute (PMI®), is the highest-paying certification in Latin America. It ranked third last year. PMP® is the most important industry-recognized certification for project managers.

A couple of foundational credentials cracked the top 10 in Latin America: ITIL® Foundation and Microsoft Certified: Azure Fundamentals.

For the second straight year, Cisco has its strongest showing in Latin America, with three now-retired certifications making the list—CCNP Routing and Switching, CCDA Design and CCNA Security.

To be included in the list, a certification must have had at least 25 Latin American responses.

TOP-PAYING CERTIFICATIONS LATIN AMERICA

Certification	Average	Count
PMP®: Project Management Professional	$55,273	27
CISA - Certified Information Systems Auditor	$50,568	39
AWS Certified Solutions Architect - Associate	$48,015	28
CISM - Certified Information Security Manager	$45,925	25
CCA-N: Citrix Certified Associate - Networking	$43,509	27
ITIL® Foundation	$43,442	108
Microsoft Certified: Azure Fundamentals	$42,872	35
CCNP Routing and Switching	$42,065	65
CCDA Design	$41,218	31
CCNA Security	$40,785	32

EMEA

(ISC)²'s Certified Information Systems Security Professional (CISSP) is the top-paying certification in EMEA and the only certification outside of North America to eclipse an average salary of $100,000.

"The mandate of GDPR and other regulations has driven a need for top-tier cyber professional leadership to implement solutions, watch for compliance violations and mitigate overall risk to reduce liability in EMEA," Puckett said. "Certifications like CISSP drive those position requirements."

GCP Data Engineer ranks second, while TOGAF® 9.1 is third. GCP Cloud Architect, which ranked first last year, comes in fifth.

While EMEA had a strong showing in project management last year, they're trending similar to North America this year, with 80% of the list made up of cloud and cybersecurity credentials.

To be included in the list, a certification must have had at least 50 EMEA responses.

TOP-PAYING CERTIFICATIONS EMEA

Certification	Average	Count
CISSP - Certified Information Systems Security Professional	$100,538	60
Google Certified Professional Data Engineer	$99,516	61
TOGAF® 9.1	$95,054	65
AWS Certified Solutions Architect - Associate	$92,636	119
Google Certified Professional Cloud Architect	$91,669	107
CRISC - Certified in Risk and Information Systems Control	$89,783	89
COBIT 5 Foundation	$86,453	61
CCIE Routing and Switching	$86,080	80
CISM - Certified Information Security Manager	$85,986	195
Microsoft Certified: Azure Solutions Architect Expert	$85,149	75

Asia-Pacific

CISSP ranks first in Asia-Pacific salary, while CRISC and PMP® rank second and third, respectively.

Asia-Pacific has two Microsoft certifications in the top 10: Microsoft Certified: Azure Fundamentals and Microsoft Certified: Azure Solutions Architect Expert. It is the second straight year that Microsoft has its strongest showing in this particular part of the world.

Higher Asia-Pacific salaries lean toward cybersecurity again this year, three of the top five revolve around information security.

To be included in the list, a certification must have had at least 40 Asia-Pacific responses.

Worldwide

CISSP has the highest global salary in 2020, rising two spots from 2019. AWS Certification Solutions Architect – Professional, which ranked first last year, just barely missed our respondent threshold and would have ranked ninth.

ISACA has three on the list this year.

"(ISC)² and ISACA continue to provide some of the highest level credentialing of general cybersecurity leadership professionals," Puckett said. "Administrative and management professionals can be assured of significant salary increases once obtaining these types of accreditations."

To be included in the list, a certification must have had at least 100 worldwide responses.

TOP-PAYING CERTIFICATIONS ASIA-PACIFIC

Certification	Average	Count
CISSP - Certified Information Systems Security Professional	$91,631	73
CRISC - Certified in Risk and Information Systems Control	$90,762	52
PMP®: Project Management Professional	$87,721	67
Google Certified Professional Cloud Architect	$85,845	81
CISM - Certified Information Security Manager	$85,158	134
Microsoft Certified: Azure Fundamentals	$79,059	59
AWS Certified Solutions Architect - Associate	$76,154	104
CISA - Certified Information Systems Auditor	$73,515	274
Microsoft Certified: Azure Solutions Architect Expert	$69,181	43
ITIL® Foundation	$68,819	364

TOP-PAYING CERTIFICATIONS WORLDWIDE

Certification	Average	Count
CISSP - Certified Information Systems Security Professional	$119,170	352
Google Certified Professional Cloud Architect	$116,289	344
Google Certified Professional Data Engineer	$114,636	182
CRISC - Certified in Risk and Information Systems Control	$113,995	332
CGEIT - Certified in the Governance of Enterprise IT	$113,738	118
PMP®: Project Management Professional	$110,646	343
CISM - Certified Information Security Manager	$107,708	615
TOGAF 9.1	$106,435	126
AWS Certified SysOps Administrator - Associate	$104,123	103
AWS Certified Developer - Associate	$103,358	116

MOST POPULAR CERTIFICATIONS

ITIL® Foundation is the most widely-held certification this year. Seventeen percent of our respondent base holds this credential.

ITIL Foundation validates an understanding of the ITIL framework and how it can be used to enhance IT service management. It is uniquely different from most certifications mentioned in this report as it remains one of the few that focuses on the intersection of IT and the needs of the business.

The most popular certification category is cybersecurity. Among certified cybersecurity professionals, 21% have earned the CISA certification and 13% have their CISM.

Here are the 10 most widely-held certifications worldwide:

1. ITIL® Foundation
2. Cisco Certified Network Associate (CCNA) Routing and Switching
3. CISA - Certified Information Systems Auditor
4. Cisco Certified Network Professional (CCNP) Routing and Switching
5. CompTIA A+
6. CISM - Certified Information Security Manager
7. CompTIA Security+
8. CompTIA Network+
9. CCA-V: Citrix Certified Associate - Virtualization
10. AWS Certified Solutions Architect – Associate

"Thirty percent of the top 10 list is cybersecurity-related," Puckett said. "This reflects the continued growing financial emphasis and investment into risk reduction and security-related defense to reduce liability."

This list illustrates the growing importance of cybersecurity. Organizations are realizing the essential nature of IT security, whereas it may not have been a top priority in the past.

MOST PURSUED CERTIFICATIONS

When looking to the future, many IT professionals are planning to acquire more cloud skills, mainly because organizations have ramped up their adoption and implementation of cloud technologies. That's why it's no surprise that three AWS cloud certifications are in the top five most-pursued IT certifications of 2020, including AWS Certified Solutions Architect – Associate, which is number one on the list.

The second most-pursued certification of 2020 is CISSP, which proves that cybersecurity, along with cloud, will again be the preeminent investment areas in IT.

Here are the top 10 certifications that IT professionals plan to pursue this year:

1. AWS Certified Solutions Architect – Associate
2. CISSP – Certified Information Systems Security Professional
3. AWS Certified Solutions Architect – Professional
4. CCNP Routing and Switching
5. AWS Certified Cloud Practitioner
6. CISM – Certified Information Security Manager
7. Microsoft Certified: Azure Solutions Architect Expert
8. Microsoft Certified: Azure Administrator Associate
9. CRISC – Certified in Risk and Information Systems Control
10. AWS Certified Security – Specialty

MOST DIFFICULT CERTIFICATION

This year we asked IT professionals about the most difficult certification they've earned. Almost every certification mentioned in this report was listed by at least one respondent.

Regarding specific certifications, CISSP and CISA were mentioned most often. One respondent said, "CISSP and CISA are equally difficult due to the breadth of material covered by each exam."

CISM was another popular choice as the most difficult, and most cited the exam's length as the reason. PMP® and Nutanix were also recurring answers.

Over 200 individuals mentioned a Microsoft certification as the most difficult to earn. Many noted that there's "a lot of ground to cover" for the Microsoft Azure exams, in particular.

Over 100 respondents listed a Cisco certification, with CCNP Routing and Switching and CCNP Security as the most common answers.

CROSS-CERTIFICATION

Generally speaking, the more certifications one holds, the better. Cross-certification is one way to boost compensation. The thinking is that the training and preparation that goes into certification will result in an enhanced IT skill set. This translates to higher associated salaries.

One way to diversify your skills, and boost your pay, is cross-certification, which involves pursuing certification across multiple technologies or bodies of knowledge.

Cross-certifying with a cybersecurity certification is universally a great way to improve your salary. And it's not a niche topic—all IT professionals should have at least a fundamental understanding of cybersecurity. So pursuing cybersecurity certification should be a goal for anybody working in tech.

We've found that pairing a cybersecurity credential with a certification in another topic or technology can improve salary up to 11%. CompTIA-certified professionals earn an average salary of $83,984. When those same individuals add a cybersecurity certification, their salary increases nearly $10,000 a year. AWS-certified professionals, who already have some of the highest salaries in the world at $97,781, see their pay increase six percent when they earn a cybersecurity certification.

"The continued migration of business operations to cloud-based technologies provides an opportunity that is unique to the industry in that cloud professionals now must provide an eye toward security in all aspects of their tasks," Puckett said. "This includes everything from cloud architecture, implementation, migration, maintenance and support. Each cloud professional is much better suited to their role with a supplemental emphasis on securing and protecting their cloud environment in each phase of the cloud instance."

CYBERSECURITY CROSS-CERTIFICATION

Certification	Average Salary	Average with AWS Certification	% Increase
AWS	$97,781	$103,936	6%
Cisco	$68,532	$71,193	4%
CompTIA	$83,984	$93,331	11%
ITIL® and IT service management	$82,738	$89,326	8%
Microsoft	$78,557	$84,011	7%

In terms of a specific certification, PMP® has a similar salary-boosting effect as a cybersecurity certification. Pairing this project management credential with other popular certifications can have a significant impact on your paycheck.

"As many IT professionals routinely work on projects, and not in IT operations, the PMP® credential signifies a professional's ability to deliver projects on schedule, scope and budget targets," said Dan Stober, Global Knowledge's global product director for project management.

IT professionals with their CompTIA A+ certification see a 36% salary increase when they add PMP®. Similar increases are documented for individuals who have earned Microsoft Certified: Azure Fundamentals (26%), ITIL® Foundation (19%), Certified ScrumMaster (8%) and CISSP (8%).

PMP® CROSS-CERTIFICATION

Certification	Average Salary	Average with PMP® Certification	% Increase
CompTIA A+	$83,948	$114,351	36%
Microsoft Certified: Azure Fundamentals	$84,481	$106,494	26%
ITIL® Foundation	$82,777	$98,273	19%
Certified ScrumMaster	$100,809	$108,711	8%
CISSP - Certified Information Systems Security Professional	$119,170	$128,330	8%

Certification Resources

The benefits of certification are abundantly clear. Certified professionals are more engaged in their work, make fewer errors and are generally paid more than their non-certified IT peers.

To help IT professionals plan for and achieve certification, we have a collection of resources to help you navigate your own certification journey.

Not sure where to start?
Find out How to Select the Right Certification for You.

Looking for a proven certification with staying power?
Check out 18 IT and Business Certifications Worth Having.

Learn more about certifications in these areas

Before you embark on your certification journey, make sure you're fully aware of the courses and exam prep available, and what's required or optional. We've listed some of the material below.

- AWS
- Business Analysis
- Blockchain
- Cisco
- Citrix
- CompTIA
- Cybersecurity
  - (ISC)²
  - EC-Council
  - F5
  - ISACA
  - Palo Alto Networks
  - SonicWall
  - and more
- DevOps
- Google Cloud
- ITIL®
- Microsoft
- Nutanix
- Project Management
- Red Hat
- TOGAF®
- Veeam
- VMware
- Wireshark

IT Decision-Maker Insights

IT decision-makers guide the use of resources (e.g., people, technology, budgets, etc.) to meet organizational needs. To ensure success, they must address challenges such as skills gaps, budget constraints, hiring and professional development.

In this year's IT Skills and Salary Report, 40% of our respondents (3,829 professionals) hold some degree of managerial responsibility over IT efforts.

Most surveyed decision-makers oversee smaller teams, as 73% manage teams of 10 or fewer. Only three percent manage a workforce of 100 or more.

KEY CHALLENGES

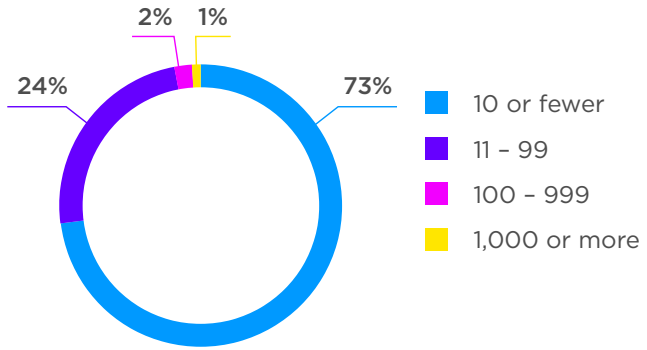
Talent recruitment and retention, and workload, are the biggest challenges for IT leaders this year.

For the second straight year, nearly half of the managers we surveyed have struggled to hire and keep skilled professionals. Within IT, there are particular areas that present greater hiring challenges, and we'll dive into those momentarily.

As for workloads, decision-makers and the employees they manage share similar sentiments—the number of assignments they have is growing and untenable. For many, workloads impact the quality of their work and impinge on their ability to dedicate formal time to professional development.

Resource and budget constraints are also obstacles faced by 42% of IT decision-makers, while 37% wished they could develop stronger teams.

NUMBER OF EMPLOYEES RESPONSIBLE FOR



KEY CHALLENGES FOR IT LEADERS

IT DEPARTMENT BUDGETS

Not all IT decision-makers manage a budget, but those who do in the U.S. and Canada are not as optimistic as in previous years. In North America, 39% of managers predict their budget will increase this year—that number was over 50% in 2019. And don't forget, these individuals were surveyed before the COVID-19 pandemic, which has forced many IT decision-makers to either decrease or freeze spending, at least at the time of this report's publication.

Other regions are a bit more hopeful, as 57% of managers in Asia-Pacific and 55% in Latin America expect a budget increase.

Worldwide, 47% of IT decision-makers expect their budget to grow while 42% expect no change. Only 11% expect a budget decrease.

FORECASTED IT BUDGET CHANGE (EXCLUDING SALARIES)

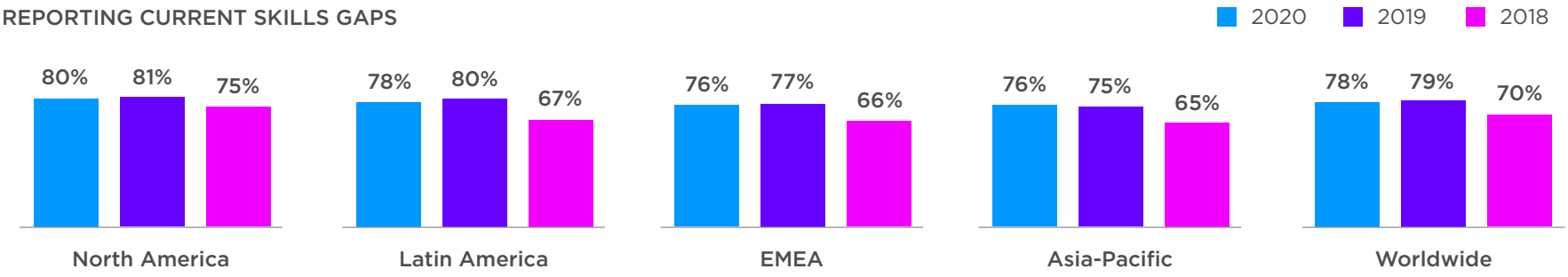
	NORTH AMERICA			LATIN AMERICA			EMEA			ASIA-PACIFIC		
	2020	2019	2018	2020	2019	2018	2020	2019	2018	2020	2019	2018
Increase	39%	52%	41%	55%	49%	44%	49%	46%	36%	57%	56%	41%
Decrease	13%	17%	23%	9%	16%	27%	11%	18%	25%	9%	17%	22%
No Change	49%	31%	35%	37%	35%	29%	40%	35%	39%	34%	27%	36%

SKILLS GAPS

In 2020, 80% of North American managers and 78% worldwide report skills gaps. The good news, if there is any, is that these percentages are down a tick from 2019, suggesting that the IT skills shortage may have hit their absolute breaking point and organizations had to invest in closing the gaps to keep projects moving forward.

We started surveying IT decision-makers about skills gaps in 2015. That first year, 36% reported a lack of necessary skills on their teams. Unfortunately, that percentage rose quickly and appreciably in the ensuing years.

REPORTING CURRENT SKILLS GAPS



Still, a majority of IT decision-makers say their teams don't have the skills required to meet current or future needs. When asked to assess the level of risk that skills gaps pose to their team objectives, 77% said the risk is medium to high. Only one percent said skills gaps pose "no risk."

Skills gaps remain a challenge and they will not disappear on their own. Sixty-eight percent of IT decision-makers anticipate new skills gaps in the next two years. Action must be taken immediately to prioritize skills development.

What causes IT skills gaps?

Skills gaps would be easier to manage if there was a single source. There's not.

IT decision-makers cite a number of reasons behind skills gaps, the foremost being that the rate of technological change is outpacing skills development. Even if IT professionals have training programs in place, they may not be robust enough to keep up with the rate of change in technology.

Another common cause is difficulty hiring qualified job candidates. Managers expecting to hire their way out of skills problems have faced a harsh reality—the candidate pool, especially in areas like cybersecurity and cloud, is much more shallow than anticipated.

Over a quarter of decision-makers say they cannot pay what candidates demand, which is just another reason why the hiring process has become such a headache for IT leadership.

So if managers can't hire skilled employees, they have to develop the skills of their current staff—but even that comes with challenges. Thirty-five percent of IT decision-makers say their organization doesn't invest enough in skills training. Another 21% are skeptical about the effectiveness of current training programs.

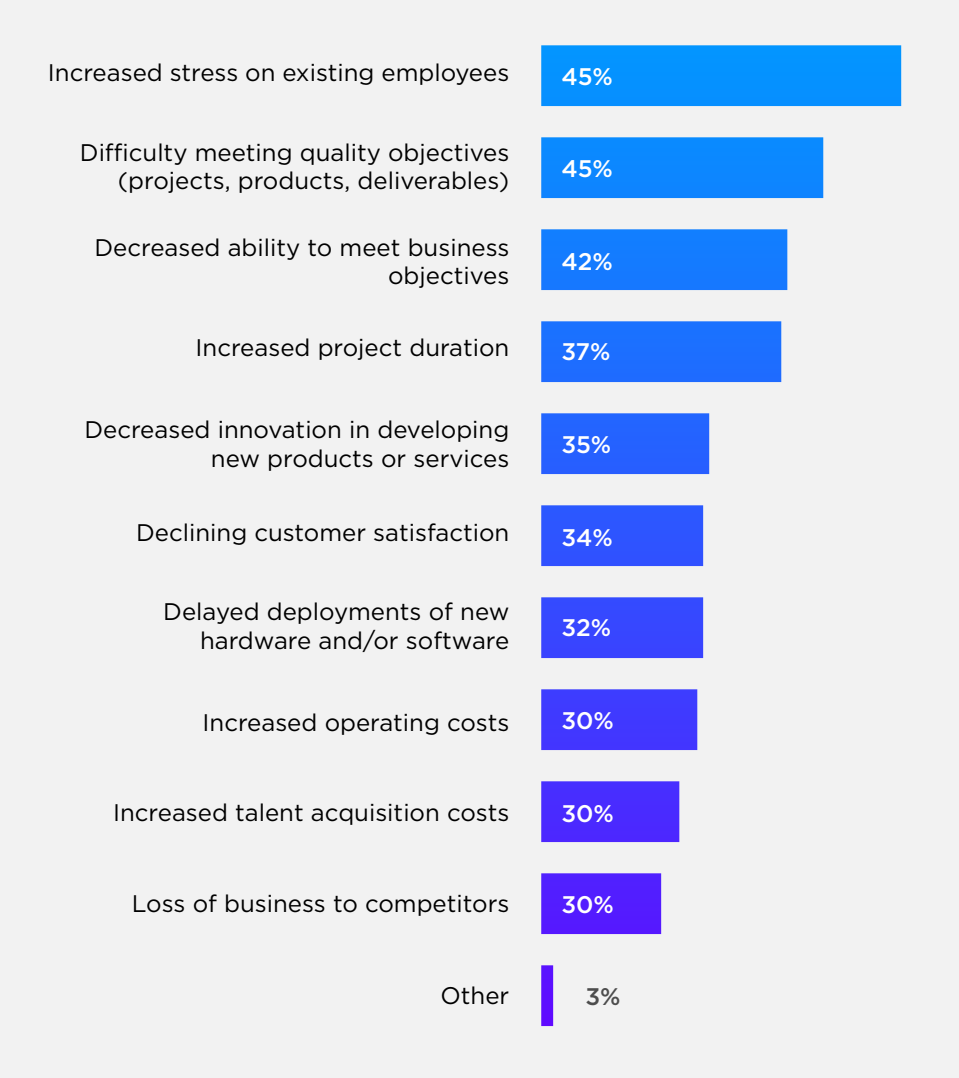
To learn more about identifying and closing skills gaps, download our free e-book, **Mind the Gap: A Six Step Guide to Organizational Success**.

REASONS BEHIND SKILLS GAPS

The costs of skills gaps

The number one impact of skills gaps is increased employee stress. Other costs include lower quality work, decreased ability to meet business objectives, increased project duration and a decline in innovation.

IMPACT OF SKILLS GAPS ON THE ORGANIZATION



According to Happify Health, 80% of American workers are stressed by at least one thing at work. Long hours and heavy workloads are leading stressors, and both are exacerbated by team skill shortages.

Many organizations will take a financial hit as a result of skills gaps. Research from the International Data Corporation (IDC) predicts that by 2022, the monetary losses resulting from IT skills gaps will be $775 billion worldwide.[1] To put that in perspective, IDC estimated the financial impact of skills gaps in 2019 to be $302 billion. That's an increase of 157% in three years.

In terms of productivity, 67% of IT decision-makers believe skills gaps cost their employees between three and nine hours of work per week. Twelve percent say the cost is north of 10 hours per employee, per week. If an IT professional is losing an average of 10 productivity hours per week to skills gaps, that's equivalent to 520 hours per year. With the average North American IT salary at $115,906, that's nearly $29,000 wasted per employee. Add in the opportunity costs of not training employees to overcome business challenges and the losses are even more substantial.

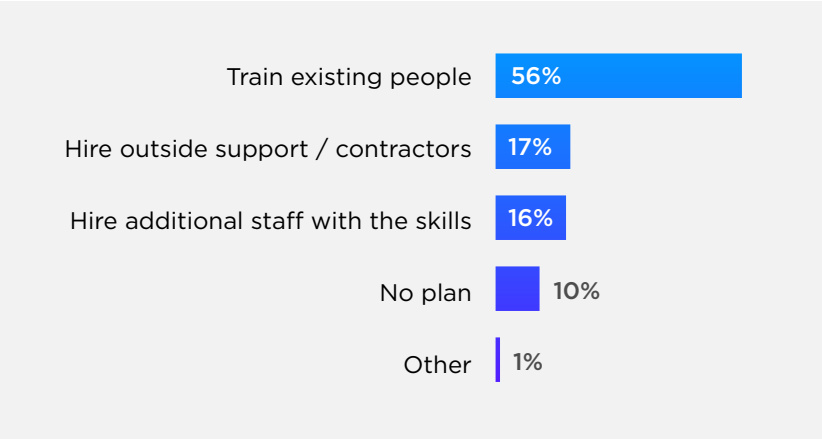
[1] IDC FutureScape: Worldwide Services 2020 Predictions, Doc# US44800319, Oct. 2019

SKILLS GAP RESPONSE

When asked how they'll respond to rising skills gaps, 56% of IT decision-makers said they'll train their existing staff. This is an increase of 17% from last year, signaling that many may be starting to understand that hiring isn't a viable solution to skill shortages.

Upskilling current employees reduces the need to go outside your organization for new talent, plus it's a great way to invest in your team. Of course, some vacant positions can only be filled with a job search. But when a specific skill is needed, managers should evaluate the benefits of hiring versus training a current team member.

HOW MANAGERS PLAN TO HANDLE SKILLS GAPS



In a positive trend, more IT decision-makers are preemptively planning to combat skills gaps than in recent years. This type of preparation requires forethought and strategy to eliminate. To not plan for a skills shortage really sets the team and department up for failure. Ignoring skills gaps and hoping they will disappear on their own is adding more roadblocks, not removing them. Budgets and organizational support may be limited, but that's no excuse to deprioritize professional development opportunities for the team. We will outline a number of low-cost and free learning resources later in this report. This type of informal training is an option if more formal training isn't approved.

HIRING

For the fifth year in a row and by a wider margin than usual, IT decision-makers have the most difficulty hiring cybersecurity talent. Forty-three percent worldwide struggle to fill IT security openings, up from 38% a year ago.

Demand is already high for cybersecurity professionals. According to an (ISC)[2] study, the cybersecurity workforce gap is nearly 500,000 in the U.S. and 4.07 million globally.[2] There simply aren't enough security professionals to keep organizations safe.

"The cybersecurity skills shortage is alarming in that unfilled cybersecurity jobs means a gap in the security matrix designed to protect critical infrastructure, financial institutions, point of sale organizations, healthcare and others," Puckett said.

Cloud computing is the second most difficult hiring area, according to 29% of managers. Cloud adoption rates are outpacing training, so decision-makers are struggling to find the right individuals to keep up with evolving technology needs. This is troubling because organizations have already invested heavily in cloud programs and services, and they need cloud architects, administrators and other experts to ensure those investments pay off.

Around the world, hiring challenges are also prevalent in analytics and big data, AI and machine learning, systems and solution architecture, and DevOps.

[2] Strategies for Building and Growing Strong Cybersecurity Teams, (ISC)2 Cybersecurity Workforce Study, 2019

TOP 10 CHALLENGE AREAS FOR FINDING QUALIFIED TALENT

Certification	North America	Latin America	EMEA	Asia-Pacific	Worldwide
Cybersecurity	43%	47%	41%	44%	43%
Cloud Computing	27%	29%	31%	30%	29%
Analytics and Big Data	20%	24%	23%	23%	22%
AI and Machine Learning	14%	19%	19%	26%	19%
Systems and Solution Architects	14%	17%	21%	17%	17%
DevOps	14%	22%	18%	18%	17%
Leadership and Management	16%	14%	15%	14%	16%
Networking and Wireless	14%	20%	16%	14%	15%
Data Policy and Governance	15%	8%	14%	14%	14%
Project Management	14%	10%	14%	12%	13%

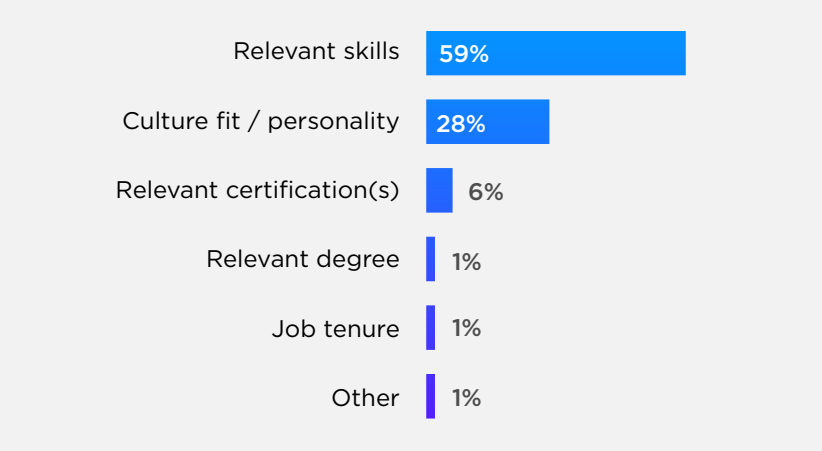
Many IT positions have gone unfilled as a result of the inability to find qualified job candidates or pay what they demand. Almost all decision-makers had at least one job they couldn't fill over the past year. Fifty-five percent have two or three open positions, while 24% have four or more.

When it comes to hiring, one thing stands out above everything else—skills. Nearly 60% of IT decision-makers say "relevant skills" are the most important hiring qualification. Twenty-eight percent are more focused on a job candidate's personality and whether or not they're a culture fit.

A relevant degree is the main focus of only two percent of IT managers. This falls in line with a renewed emphasis on **degree deflation**, which suggests that relevant training and certification should be emphasized more highly during the hiring process. Without diminishing the value of higher education, hiring managers can instead elevate the importance of skills. Also, what's the benefit of evaluating applicants based on a college degree that may not be relevant to the job they're applying for?

Requiring a college degree has likely eliminated strong job candidates in the past. This is troubling given how desperately IT managers need to fill open positions in critical job roles.

MOST IMPORTANT HIRING QUALIFICATION



THE VALUE OF TRAINING

Sixty-three percent of IT decision-makers say their organization provides formal training for employees, up four percent from last year.

Another positive trend is that more training was authorized in the last 12 months. When formal training was provided by the company, 80% of decision-makers authorized it. Last year, only 59% of managers approved training.

When formal training is available, managers must do everything in their power to ensure employees have the opportunity to build necessary skills because it benefits not just the employee, but them as well.

Rising workloads have put some managers in the difficult position of not authorizing their staff to train for even a day or two because they can't spare them. It's a tough position to be in, but if there are concerns about the productivity lost from having an employee "away from their desk" to perform better at their job, imagine the productivity that will be lost due to skills gaps.

If IT decision-makers don't approve training now, they'll pay for it later in the form of ill-prepared employees for new projects or deployments, risks to internal and external customer service, increased employee stress and turnover, which all can lead to lost revenue. Investing in professional development signals to your staff that you're invested in their future, which is also an investment in the company's future.

If budget constraints are the main reason for not authorizing training, the cost of replacing an employee is much higher than training them. The Center for American Progress reports the cost of replacing a staff member is roughly 21% of their salary.[3] Since the average non-management salary in North America is $105,736, it would cost over $22,000 to replace that employee.

Need help convincing your manager to approve training?
This guide will help.

THE VALUE OF CERTIFICATION

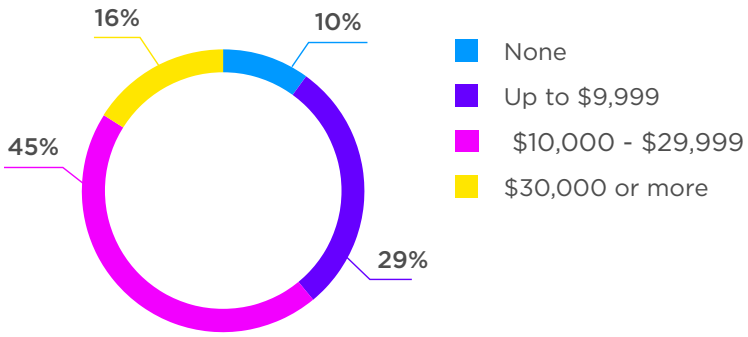
For the IT decision-makers who authorized training, 70% did so for purposes of certification or recertification.

Certification value is nearly unanimous—94% of decision-makers worldwide say that certified team members provide added value above and beyond the cost of certification. To put a number on it, over half of those surveyed estimate the annual economic benefit of a certified employee is more than $10,000. Sixteen percent estimate the benefit is $30,000 or higher.

The skills gained in certification prep provide a tremendous amount of transferrable value to teams and organizations. If budget is the main reason training isn't authorized, IT decision-makers must make the case that certified employees will more than cover the initial investment.

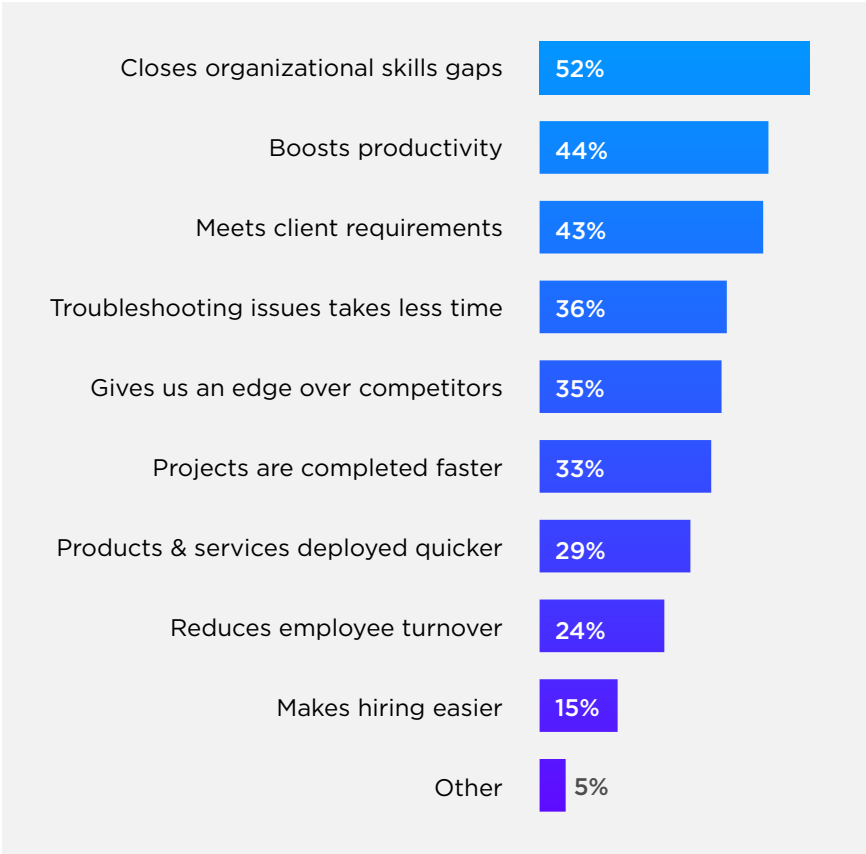
[3] There Are Significant Business Costs to Replacing Employees, Center for American Progress, Nov. 2012

ESTIMATED ANNUAL ECONOMIC BENEFIT OF CERTIFIED EMPLOYEES



The main benefit of certified personnel is their ability to close organizational skills gaps. Certified employees are also more productive, meet client requirements, troubleshoot issues quickly, provide an edge over competitors, and complete projects faster.

BENEFITS OF A CERTIFIED STAFF



Professional Development

Professional development includes formal and informal learning—everything from researching a topic online to attending an instructor-led training course. It can be a short process, perfect for when you need a quick skill refresher or require a greater investment, like a multi-day certification prep course.

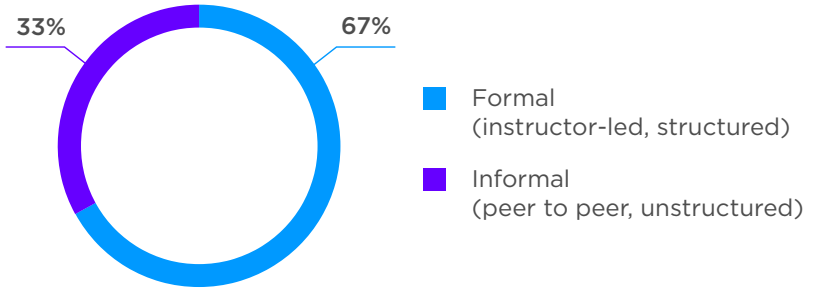
A majority of the IT professionals we surveyed prefer a more structured approach to learning. When the outcome of their work depends on their skills, 67% of IT professionals prefer formal training over informal, the same percentage as last year.

It's also important to understand that professionals do not have to choose between one or the other. The most effective training strategy is a combination of formal and informal methods. All learning types have value, whether you're asking a peer for assistance or attending a live virtual class. Make sure you know what type of skill you're looking to add, and how critical the skill need is before you select your training method.

Not sure which training type to use?

The Global Knowledge Skills Development Index™ matches the optimal training modality with specific skill needs.

PREFERRED METHOD TO LEARN



FORMAL TRAINING

There's a disparity in training preference and effectiveness, and how IT professionals actually train. Nearly half of our respondents would choose classroom training over all other options. On-demand, or self-paced training, is the second most preferred method of formal training.

This aligns with perceived training effectiveness, as 69% of IT professionals say classroom training is "very effective" or "extremely effective." Fifty-one percent feel the same way about on-demand training.

But in reality, the type of training these professionals are participating in does not match their preferences. Sixty-six percent attended on-demand training last year while only 39% trained in a classroom.

TRAINING TYPES PARTICIPATED IN OR ATTENDED IN LAST 12 MONTHS

Training Type	North America	Latin America	EMEA	Asia-Pacific	Worldwide
Web-based, on-demand session (self-paced, e-learning, subscription-based)	71%	66%	62%	61%	66%
Classroom training (out-of-office)	37%	37%	41%	42%	39%
Informal training session at work (impromptu, peer-to-peer)	39%	36%	34%	33%	36%
Live instructor-led online training	31%	29%	22%	20%	26%
Formal training session at work (expert-led)	24%	22%	25%	25%	24%
None	9%	7%	10%	9%	9%
Other	3%	2%	2%	2%	2%

It's no surprise why the learner prefers classroom training. There are fewer distractions in the classroom, as opposed to training at home or in the office. Plus, you get to interact in real time with instructors and classmates. When you need to add critical skills that are a high priority for the business, nothing beats instructor-led training.

On-demand training, on the other hand, provides greater flexibility. As we explored in the IT decision-maker section, IT workloads are a real problem. Managers are hesitant to approve training and even more reluctant to allow team members to be away from the desks to attend a course. That's likely why on-demand is the most-used training type, even though it's not the most preferred.

For IT professionals who said their company offered formal training this year, 66% took part in online training (e.g., virtual classroom) while 62% attended a course with an outside training provider. Fifty-eight percent said their company provides internal IT training.

Due to the COVID-19 pandemic, most in-person classroom training sessions had to be moved to a virtual format. Though virtual classroom training was only the top choice for eight percent of our respondent base, many were not familiar with it until recently. We're interested to see what the data shows us in our 2021 survey.

Virtual training is not a new concept for established training organizations who already invest heavily in the virtual training experience. From Global Knowledge's post-course surveys, many professionals have been pleasantly surprised by the quality and convenience of virtual training. Our streaming virtual classrooms have all the advantages of in-person classroom training. They're taught by the same certified instructors and provide access to the same courseware and labs that our in-person classes provide. Our online platform delivers a live and interactive environment, allowing for real-time discussions.

Never trained virtually before?

Take an online tour of our virtual classroom and experience the interactivity and collaboration for yourself.

INFORMAL TRAINING

Informal learning is a key component of professional development. IT professionals have a wealth of resources available to help them build less critical skills and fill in knowledge gaps between formal trainings.

Referencing books, textbooks and manuals, and researching a topic online are the most preferred informal learning resources. Looking something up, whether in a book or on the internet, is the most efficient way to gain knowledge about a particular skill. It's also become so instinctual that it probably doesn't feel like "learning." But filling in even the smallest skills gap can be helpful.

Over half of worldwide IT professionals also attended a webinar, downloaded a white paper or attended a seminar, luncheon or conference in the past year.

LEARNING RESOURCES USED IN THE LAST 12 MONTHS

Training Type	North America	Latin America	EMEA	Asia-Pacific	Worldwide
Books, textbooks, manuals	58%	72%	64%	55%	60%
Researched a topic online	67%	51%	59%	49%	60%
Attended a webinar	65%	53%	56%	49%	58%
Downloaded a white paper or technical guide	58%	59%	59%	50%	57%
Attended a seminar, luncheon or technical conference	56%	41%	48%	46%	51%
Joined an online community (e.g., blogs, Reddit, CNET)	26%	25%	27%	22%	26%
Posted to or followed someone on social media	18%	21%	22%	18%	20%
Podcasts	23%	18%	18%	13%	19%
Other	11%	11%	10%	7%	10%
None	2%	2%	2%	4%	3%

WHY PROFESSIONALS TRAIN

Globally, 91% of IT professionals took some form of training last year—up from 85% in 2019. The main reason most seek training is to build new skills. Seventy-eight percent of both IT staff and decision-makers train to improve their skill set.

Another 45% said they trained to prepare for a certification, while 37% wanted to be ready for a new technology or product migration.

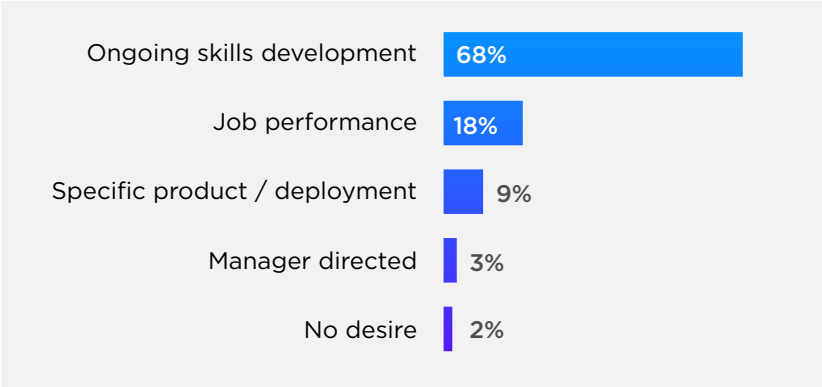
REASONS TO TRAIN

Reason	IT Staff	IT Decision-maker	Overall
Build new skills	78%	78%	78%
Prepare for a career certification or specialist exam	50%	38%	45%
Prepare the organization for a new technology or product migration/deployment/upgrade	35%	41%	37%
Salary increase	38%	30%	34%
Prepare to qualify for a different job	33%	30%	32%
Meet employer's requirement	32%	27%	29%
Evaluate new technology and products for possible purchase	24%	28%	25%
Other	4%	5%	4%

The IT professionals who said they train to "build new skills," we asked what their main driving force is. Nearly 70% mentioned the importance of ongoing professional development. Eighteen percent said it was motivated by job performance, while nine percent had a specific product or deployment to prepare for.

The IT professionals who trained to achieve a certification, we asked how it impacted their job effectiveness. Over half (52%) noticed the quality of their work improve post-certification. Another 36% said they are now more engaged in their work, while 31% said they perform their duties faster.

MAIN TRAINING DRIVER



POST-CERTIFICATION EFFECTIVENESS

TRAINING INHIBITORS

Many IT professionals said they aren't getting the support they need from management or their organization. The fact that nine out of every 10 tech professionals took some form of training in the last 12 months shows their grit.

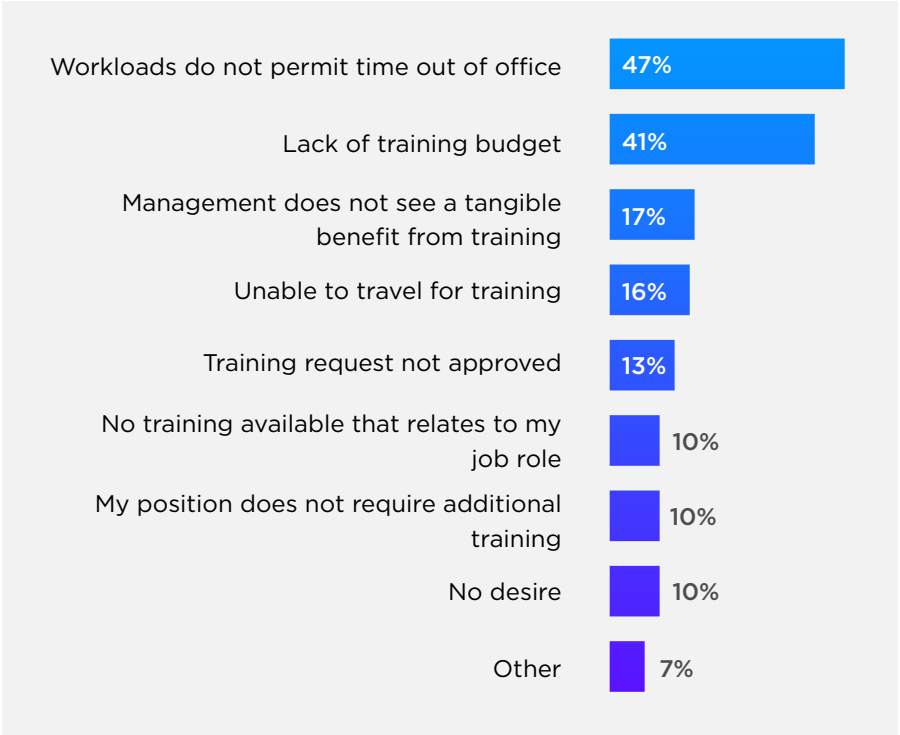
Workload is a main challenge for IT leaders and is also the foremost reason why IT professionals don't train. Forty-seven percent say their day-to-day job duties prevent them from being out of the office.

According to one respondent, "planned training time is now used to catch-up on work instead."

Many IT professionals say they are reluctant to train on nights and weekends because they don't want to encroach on their personal time. Work-life balance is growing increasingly important with our respondents.

Another 41% said a lack of a training budget is their biggest training inhibitor, while 17% cite a lack of support from management. The fact that some managers don't see a tangible benefit of training highlights how identifying training objectives and outlining what success looks like are critical steps. They cannot be skipped or deprioritized. Building a learning culture is the best way to ensure organizational goals are met and new skill sets continue to evolve.

TRAINING INHIBITORS



Job Satisfaction

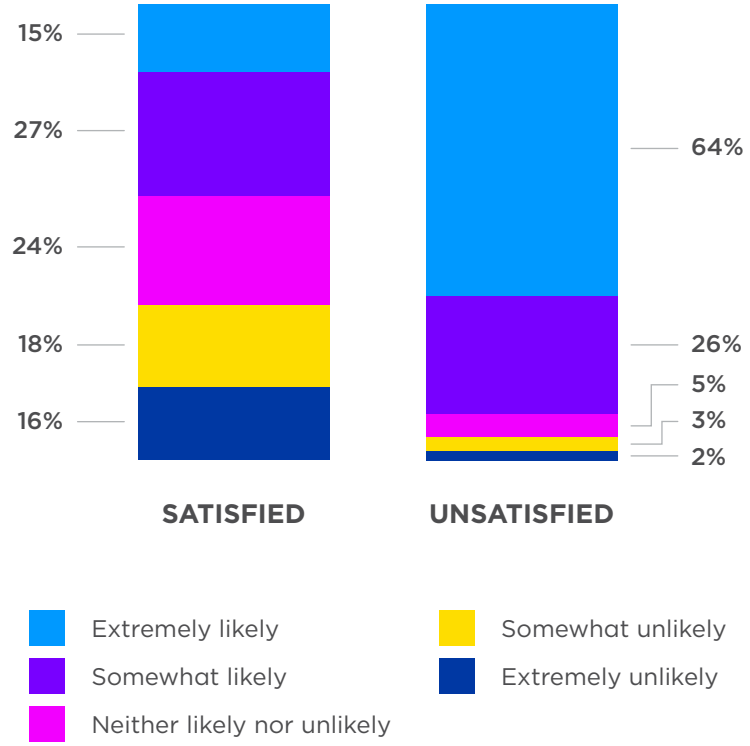
Seventy-two percent of IT professionals are at least somewhat satisfied in their job, the same percentage as last year. Keeping employees fulfilled and effectively managing stress levels are crucial because dissatisfied IT professionals won't hesitate to seek alternative employment.

Ninety percent of dissatisfied IT professionals are likely to pursue a new job this year, compared to 42% who are satisfied with their current position. This is a major issue, as we've documented that talent recruitment and retention are the top challenges for IT leaders. Our survey respondents have made it abundantly clear—they will not wait out a bad work situation. If they are overwhelmed, unhappy or believe the company isn't investing enough in their development, they will pursue other opportunities.

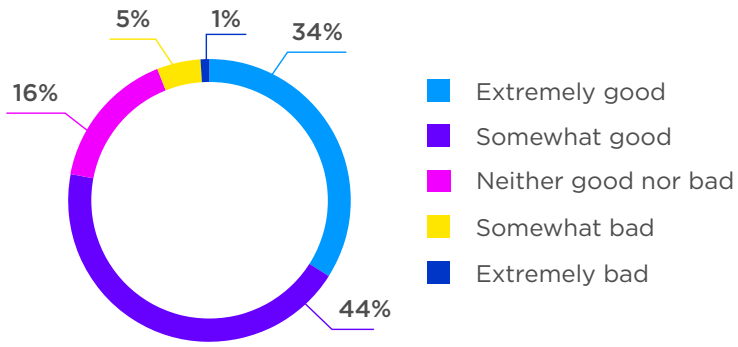
JOB SECURITY

Most IT professionals are confident about their job security. Seventy-eight percent feel somewhat or extremely good about their job status, versus six percent who feel somewhat or extremely bad. Keep in mind, this survey was conducted well before the U.S. unemployment rate reached 14.7% in April 2020. Before the pandemic, a strong majority of IT professionals did not worry about being laid off. If IT professionals changed employers—and 20% did in the last 12 months—then it was likely a decision by the employee, not the employer.

JOB SATISFACTION AND LIKELIHOOD TO PURSUE A NEW POSITION



JOB SECURITY



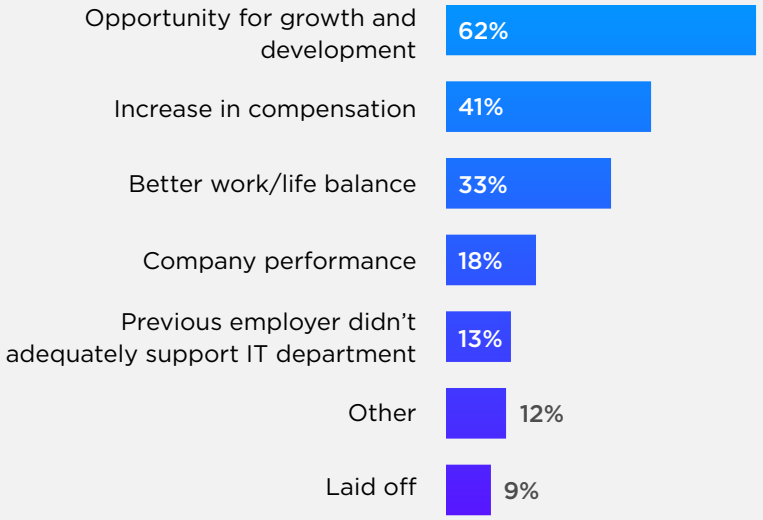
EMPLOYEE TURNOVER

One out of five IT professionals around the world changed employers in the last year. That's a huge deal for managers who are struggling to hire qualified candidates to fill open positions.

For the second straight year, these individuals who changed employers told us that growth and development opportunities were the biggest reason why. Higher salary was the second biggest reason, while better work/life balance the third most important.

It's not always about salary. Sure, most IT professionals would welcome a larger paycheck. But for the most part, they value career growth more. IT professionals want to constantly learn and enhance their skills. That's part of the excitement of working with technology—it drives users and adopters to constantly evolve with it.

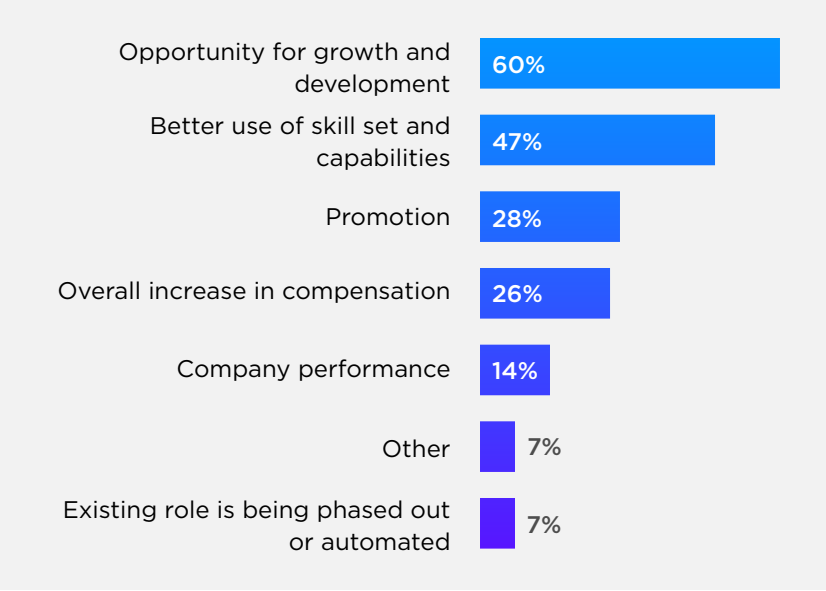
FACTORS FOR CHANGING EMPLOYER



IT professionals also cited other factors for changing employers in the open-field section of our survey, including "toxic boss," "emotional well-being" and "previous manager overlooked me for a due promotion."

This year, we also surveyed IT professionals who changed job roles, not necessarily employers. While 31% changed roles, their main driver was the same as those who changed companies—more opportunity for growth. Only 26% changed job roles because of a compensation increase.

FACTORS FOR CHANGING JOB ROLES



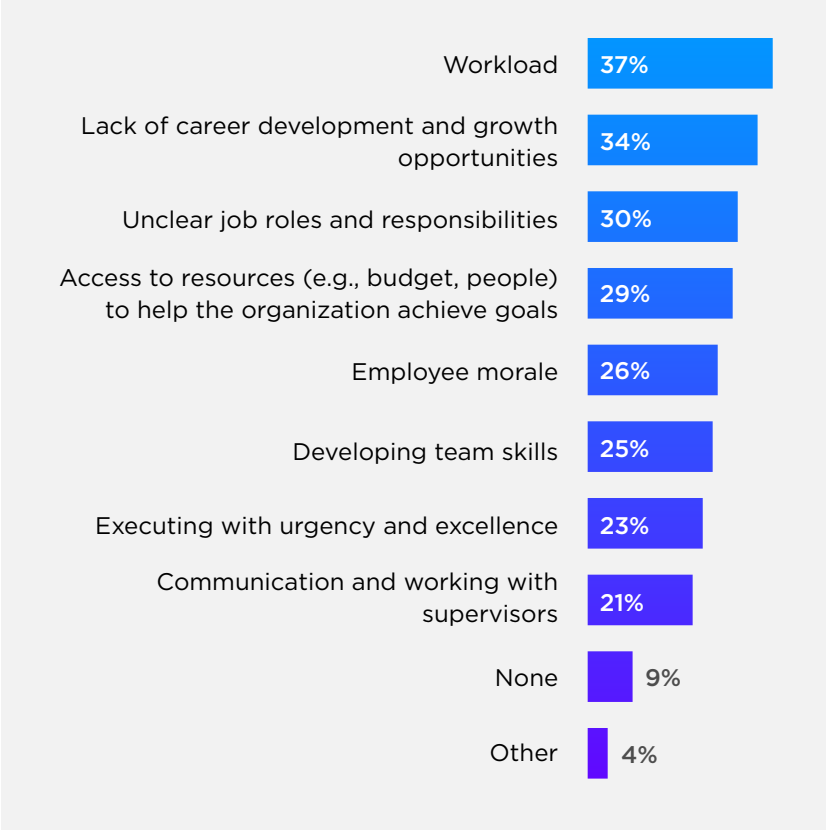
WORKPLACE CHALLENGES

IT staff and decision-makers are on the same page about their biggest challenge this year—workloads. Thirty-seven percent of all survey respondents said the workload is an issue across their department. Echoing the sentiments of those who changed jobs in the past year, 34% of IT professionals said they lack career development opportunities.

Thirty percent said their role and responsibility is unclear, while 29% said they don't have enough access to resources.

Employee morale and skills development are also challenges experienced by at least one out of every four IT professionals.

CURRENT WORKPLACE CHALLENGES



Looking Forward

It's imprudent to discuss the future of IT without first contemplating the impact of COVID-19 and the economic slowdown. The short-term effects are already being felt, while long-term consequences are more difficult to predict. Before we dive into results from our global survey, let's examine how the technology sector has responded to the global pandemic and explore predictions about IT spending and growth.

IMPACT OF COVID-19

In terms of IT education, we've seen the demand for virtual classroom training increase. Only 26% of our survey respondents participated in virtual training in the past year, and we expect that number to skyrocket for next year's report as in-person training has been halted. Virtual classroom training has all of the advantages of a physical classroom (e.g., instructor-led, real-time interaction, live labs). We are confident that any IT professional who is fervent about training in-person will quickly realize the benefits and similarities of a live virtual classroom.

As for the IT education market, IDC forecasts that the demand for training in North and South America will decline by 13.5%. Growth in EMEA and Asia-Pacific won't suffer as much.

IDC also estimates that software spending, which has been strong for several years, will decline 1.5% before rebounding quickly.[4] When it comes to spending on IT services, what was predicted to be a growth of more than four percent in November 2019 has swung to an anticipated drop of over six percent worldwide.

Predicted areas of growth

While IT will not be spared from the pandemic's impact, growth is still projected in certain tech areas, such as cloud and infrastructure. During an economic slowdown, organizations will look to the cloud to drive digital strategies. This will likely require an even stronger emphasis on cloud vendor management and a better understanding of how the cloud can serve customers. Internally, more remote work and less travel will also increase the focus on secure access to cloud services.[5]

Also, IDC predicts that infrastructure spending will post moderate growth as businesses will continue to fund cloud deployments and maybe even accelerate cloud projects.[6]

Cybersecurity is also an area that cannot be ignored, even as budgets tighten. Without proper security professionals, sensitive data and information is ripe for the taking. Cybercriminals and hackers aren't going to put their computers away just because there's a pandemic. Cyberattacks will continue to grow in frequency and intensity. In fact, during the COVID-19 pandemic, the number of phishing attacks increased by 667%.[7]

"Large-scale disruptions to everyday life are viewed as opportunities to cybercriminals," Brad Puckett said. "Changes in position, posture or circumstance mean possible open doors and expose vulnerabilities while workforce and infrastructure are strained and distracted. Cybersecurity careers become increasingly secure and positions valued as uncertainty grows in the enterprise."

Want to know if your job is recession-proof? **These 10 IT roles have proven to be essential** during times of crisis.

[4] IDC, Worldwide and U.S. IT Education and Training Services Forecast, 2020–2024, May 2020, Doc #US46330917. [5] IDC, Post-COVID-19: A CIO Recovery Guide — The CIO as Business Strategist, Doc #US46264620, May 2020. [6] IDC Lowers Forecast for Worldwide IT Spending to a Decline of 5.1% in 2020, but Cloud Spending Remains Relatively Resilient, May 2020. [7] Coronavirus phishing attacks up 667% since February, research finds, CIO Dive, March 26, 2020

TOP INVESTMENT AREAS

Cloud computing has been the top IT investment area since 2017—until this year, that is. As we look ahead to 2021, 51% of IT decision-makers say cybersecurity will be a priority for their team, while cloud computing is a key investment area for 43% of decision-makers.

Not coincidentally, cybersecurity and cloud are also the two most difficult hiring areas, so managers probably feel more pressure to invest in domains that are lacking in skilled professionals.

Governance and compliance, an offshoot of cybersecurity, is the third biggest investment area this year, while data management is a priority for 30% of worldwide decision-makers.

CURRENT WORKPLACE CHALLENGES

Area	North America	Latin America	EMEA	Asia-Pacific	Worldwide
Cybersecurity	51%	52%	51%	52%	51%
Cloud computing	42%	43%	43%	43%	43%
Governance and compliance	40%	27%	31%	35%	35%
Big data / data management	26%	33%	32%	31%	30%
Infrastructure and systems	26%	28%	30%	26%	28%
AI, cognitive computing and machine learning	21%	32%	28%	34%	27%
GDPR and data privacy	24%	17%	25%	23%	24%
Internet of Things (IoT)	14%	25%	24%	24%	20%
Virtualization	15%	20%	19%	16%	17%
Networking and wireless LAN	13%	21%	17%	14%	15%
Business process management	16%	12%	13%	10%	13%
Service management	12%	10%	14%	12%	13%
Software development	11%	12%	14%	8%	11%
Blockchain	7%	14%	12%	15%	11%
Containers	9%	14%	11%	9%	10%

EXISTING SKILL SETS

When asked to analyze their team's acumen in certain technology areas, 69% of IT decision-makers said their blockchain skills are low. Other emerging technologies, such as AI, machine learning and Internet of Things (IoT), are some of the weaker skill sets, most likely because many organizations have yet to adopt or are early stages of integrating these newer technologies into their business.

While it's a major priority area, 36% of IT managers classified their team's cloud skills as weak. Twenty-six percent said the same thing about cybersecurity skills.

The 10 weakest IT skill sets are in the following areas:

1. Blockchain
2. AI, cognitive computing and machine learning
3. Containers
4. Internet of Things
5. Big data
6. Mobile app development and deployment
7. Cloud computing
8. GDPR and data privacy
9. Customer relationship management
10. Web development

IT decision-makers are most confident in their team's expertise in the following areas: networking and wireless LAN (58%), infrastructure and systems (50%), virtualization (47%) and software development (45%).

TOP TECHNOLOGY PROVIDER FOCUS AREAS

More than half of our survey respondents expect Microsoft to be a focus area for their organization this year. Fifty-two percent say Microsoft is of interest to their business, with EMEA showing the highest level of investment (56%). Microsoft is the leader in all regions.

For the second straight year, AWS is the second most mentioned tech provider focus area, while Cisco is ranked second in both Latin America and EMEA.

TOP 10 TECHNOLOGY FOCUS AREAS FOR 2020

Area	North America	Latin America	EMEA	Asia-Pacific	Worldwide
Microsoft	51%	47%	56%	51%	52%
AWS	40%	34%	30%	44%	37%
Cisco	25%	44%	37%	29%	31%
VMware	25%	31%	32%	27%	28%
Google Cloud Platform	18%	20%	24%	29%	22%
Oracle	15%	16%	19%	15%	16%
SAP	13%	19%	18%	16%	16%
Red Hat	12%	18%	14%	18%	14%
ServiceNow	21%	5%	8%	12%	14%
Citrix	13%	15%	15%	14%	14%

Conclusion

Year over year, many positive trends have emerged in the Global Knowledge 2020 IT Skills and Salary Report. Ninety-one percent of worldwide IT professionals trained in the past year (up seven percent from 2019) and 87% have earned at least one career certification (up two percent from 2019).

Maybe the most promising trend of the report is the surge in manager support for staff development. When formal training was approved by the company, 80% of IT decision-makers authorized it, an increase of an astonishing 36% from a year ago. This indicates that the consequences of skills gaps and challenges of hiring are no longer being ignored. Upskilling current staff is the best and most economical approach to combating skill shortages on a team.

IT professionals have a wealth of opportunities to boost their pay. Learning a new skill or earning a certification makes you more valuable to your organization, and thus the opportunity for a raise or bonus is enhanced.

Similar to previous years, cybersecurity and cloud computing are the top IT investment areas. They are also associated with higher-than-average salaries and some of the top-paying certifications in the world. On the flip side, decision-makers are struggling to find qualified job candidates in these fields. There's plenty of opportunities for IT professionals in cloud and cybersecurity, but there are also plenty of pitfalls for organizations that don't employ skilled employees in these roles.

While skill shortages in cloud and cybersecurity don't appear to be going way, skill gaps, in general appear to have plateaued after increasing substantially every year since 2016. Still, nearly 80% of IT departments face critical skill shortages, which results in lost productivity and, unavoidably, lost revenue.

We like the upward training trend and believe it will have encouraging short- and long-term effects on skills gaps. Continual training is the solution to many of the challenges faced by our survey respondents. Workloads, employee morale, hiring and innovation all benefit when IT professionals are educated, motivated and have access to the necessary resources.

In terms of certification, the numbers don't lie—there are major advantages to earning certifications across multiple technologies and topics. This type of cross-certification not only expands your expertise and quite possibly your paycheck, it also makes you more desirable to IT leadership. Making yourself indispensable in your job is the best way to achieve the growth and development opportunities that so many IT professionals covet.

With all that said, there is no way to predict how the COVID-19 pandemic will affect IT going forward. Many plans have already been delayed and budgets may have a lot of uncertainty factored into them. We hope that all of the positive momentum in the IT space will not be undone by an economic slowdown. Many areas, such as cloud computing, are safer than others, though it is likely that IT won't be totally recession-proof. Know that no matter the circumstances, there are types of training to match any situation (e.g., virtual classroom for when you are working from home) and learning methods to fit any budget (e.g., webinars, white papers, online communities). IT decision-makers must get creative to infuse skills into their teams, especially if budget is an issue. Informal or free learning resources are better than no training at all.

SURVEY METHODOLOGY

The 2020 IT Skills and Salary Survey was conducted online from September 2019 through November 2019 using the Qualtrics XM Platform. Global Knowledge and technology companies distributed survey invitations to millions of professionals around the world, primarily in their databases. The survey was made available in web articles, online newsletters and social media. The survey yielded 9,505 completed responses. The survey was tabulated using the Qualtrics XM Platform.

If you would like to participate in distributing the annual survey, please see page 49 for contact information.

THANKS TO OUR PARTNERS

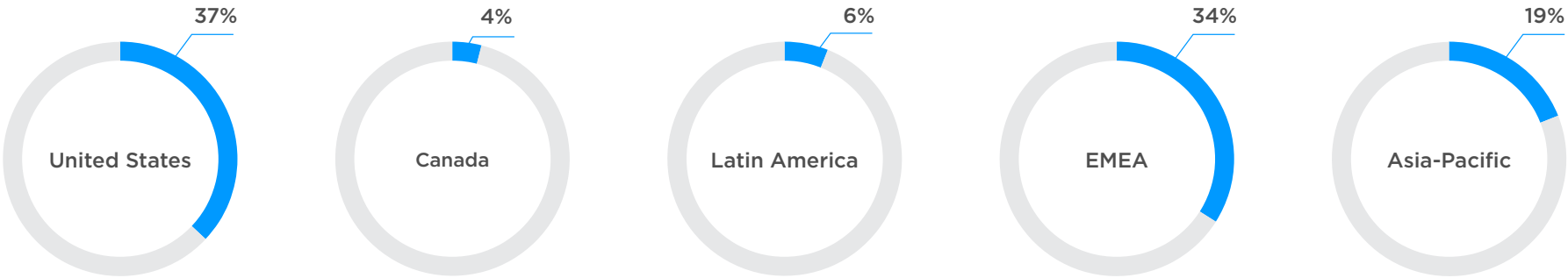
Global Knowledge extends a special thank you to our partners for helping make this year's survey possible:

Additional support from:

- AXELOS
- CWNP
- F5
- Red Hat

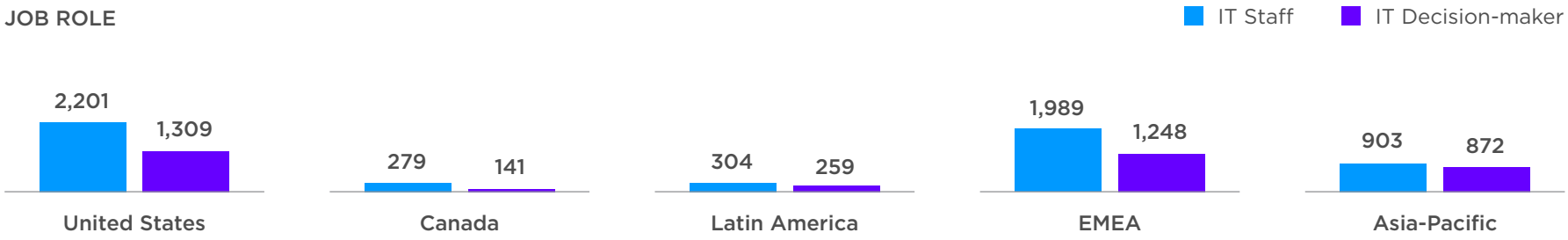
DEMOGRAPHICS

RESIDING COUNTRY OR REGION

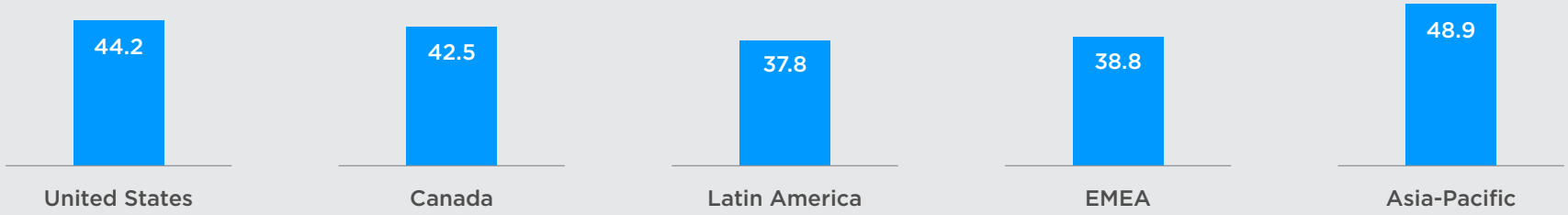


DEMOGRAPHICS

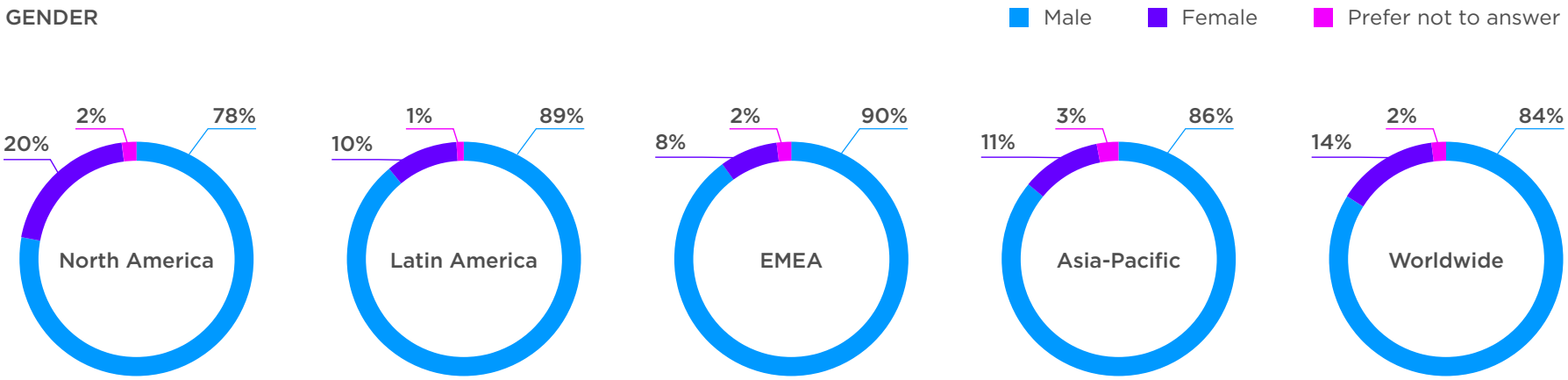
JOB ROLE



AVERAGE AGE

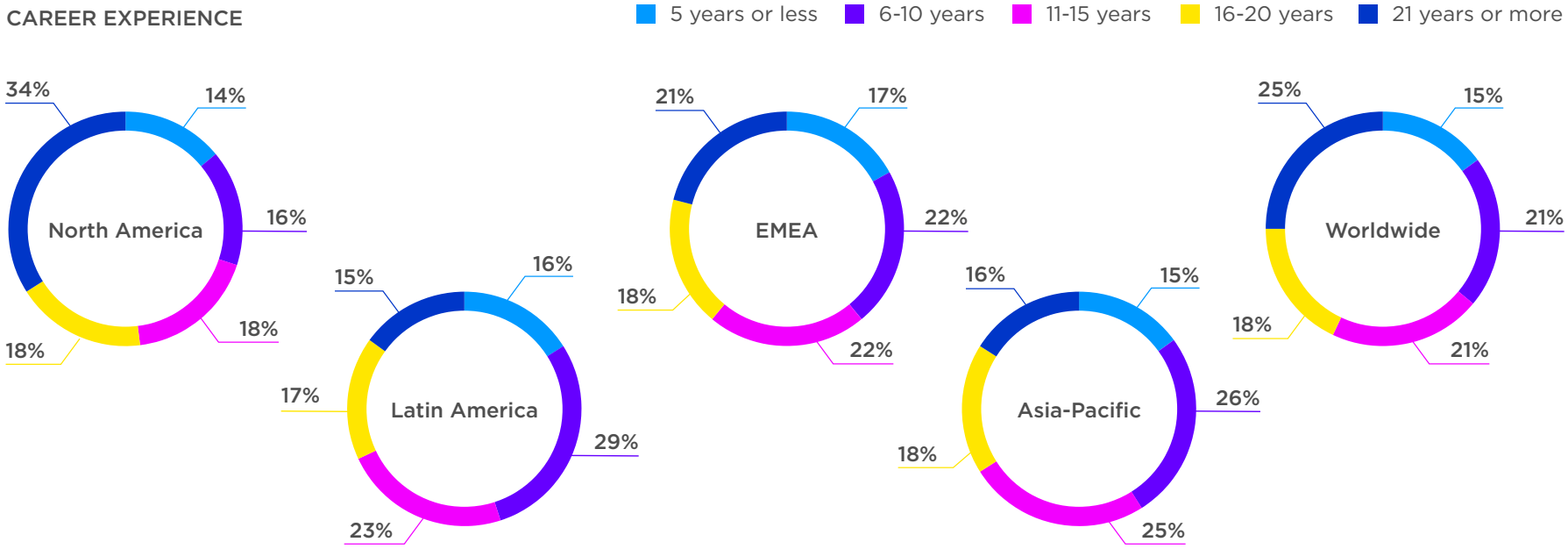


GENDER

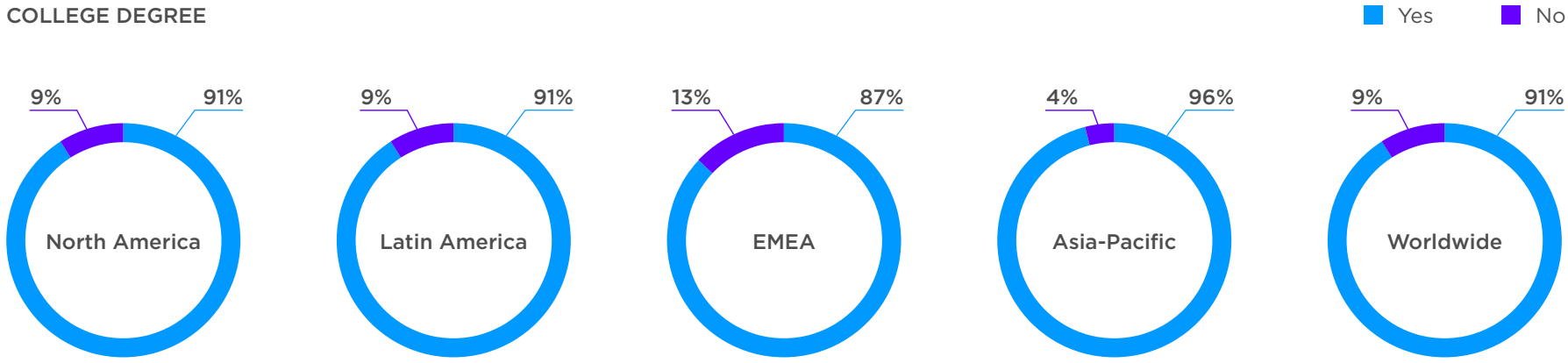


DEMOGRAPHICS

CAREER EXPERIENCE



COLLEGE DEGREE



About Global Knowledge

Global Knowledge builds skills that enable success.

Global Knowledge is a world leading technology skills training provider, supporting major enterprises and IT professionals with innovative and flexible learning solutions, including authorized content from major technology providers.

Training is delivered in multiple modalities, including digital, virtual and physical classrooms, blended formats, and customized on-site training. Both directly and through a worldwide partner network.

Global Knowledge has its corporate headquarters in Cary, North Carolina, and a network of international offices and training facilities.

www.globalknowledge.com

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