

TABLE 128
Impact of producing cloud-based computing systems and applications or goods or services with cloud-based computing systems and applications on skill level of workforce, by industry: 2016–18
 (Number and percent)

Industry	NAICS code	Companies (number)	Number of workers			Skill level of workers			STEM skills of workers											
			Increased	Decreased	Did not change	Increased	Decreased	Did not change	Increased	Decreased	Did not change	Did not employ								
All industries	11, 21–23, 31–33, 42–81	152,252	16.3	3.6	80.1	31.6	1.3	67.1	23.8	0.8	44.3	31.1								
Manufacturing industries	31–33	3,553	19.5	7.2	73.3	32.6	1.6	65.8	26.6	1.7	47.1	24.7								
Food	311	241	14.5	r	D	70.1	19.9	r	D	64.7	13.7	r	D	49.4	21.6					
Beverage and tobacco products	312	74	14.9	r	D	79.7	31.1		D	63.5	18.9		D	58.1	16.2					
Textile, apparel, and leather products	313–16	136	16.2	r	D	78.7	26.5		D	69.1	16.2	r	D	26.5	52.2					
Wood products	321	99	r	20.2	r	D	33.3	r	17.4	r	0.0	82.6	22.4	0.0	56.2	r	21.4	r		
Paper	322	6		D		0.0	83.3		D		0.0	83.3		D		0.0	83.3		0.0	
Printing and related support activities	323	603	17.5	r	6.0	76.5	30.5		D	69.5	19.1	r	D	47.8	33.1					
Petroleum and coal products	324	0	0.0		0.0	0.0	0.0		0.0		0.0		0.0	0.0	0.0					
Chemicals	325	173	13.3	r	D	83.2	8.1		0.0	91.9	10.6	r	0.0	81.2	8.2	r				
Pesticide, fertilizer, and other agricultural chemical manufacturing	3253	48	r	0.0		0.0	100.0		0.0	0.0	100.0		0.0	0.0	100.0	0.0				
Pharmaceuticals and medicines	3254	18	35.3		0.0	64.7	r	D	0.0	83.3	r	57.9	r	0.0	42.1	0.0				
Soap, cleaning compound, and toilet preparation manufacturing	3256	26	0.0		0.0	100.0		D	0.0	88.5		D		0.0	42.3	46.2				
Other chemicals	other 325	80	22.5	r	D	71.3	8.9		0.0	91.1	8.8		0.0	87.5	D					
Plastics and rubber products	326	118	r	9.3	r	D	88.1	16.0	r	0.0	84.0	9.3	r	D	79.7	D				
Nonmetallic mineral products	327	85	18.6		9.3	r	72.1	16.5		D	83.5	9.2	r	0.0	42.5	48.3				
Primary metals	331	5	80.0		0.0	D	80.0		0.0	D	D		0.0	D	0.0					
Fabricated metal products	332	290	24.5	r	D	75.2	41.2	r	0.0	58.8	30.7	r	0.0	31.7	r	37.6	r			
Machinery	333	298	33.6	r	D	66.4	56.5		D	43.5	57.9		D	19.0	r	23.1	r			
Computer and electronic products	334	527	24.3		3.6	72.1	37.0		D	61.9	34.7		D	55.0	8.5					
Communications equipment	3342	111	19.8		D	78.4	25.4		0.0	74.6	22.7		0.0	65.5	11.8	r				
Semiconductor and other electronic components	3344	38		D	23.7	r	76.3	16.2	r	0.0	83.8		D	D	68.4	D				
Navigational, measuring, electromedical, and control instruments	3345	225	23.3		3.1	r	73.6	41.3		D	56.9	39.6		D	51.6	7.1	r			
Other computer and electronic products	other 334	154	35.1		D	64.3	43.8		0.0	56.2	43.2		0.0	49.7	7.1					
Electrical equipment, appliances, and components	335	114	41.2		0.0	58.8	62.9		0.0	37.1	59.6		0.0	36.8	D					
Transportation equipment	336	99	11.1		D	83.8	33.3	r	D	62.6	38.4	r	D	45.5	14.1	r				
Automobiles, bodies, trailers, and parts	3361–63	65	13.8	r	D	76.9	44.6	r	D	49.2	r	49.2	r	D	41.5	r	D			
Aerospace products and parts	3364	17	0.0		0.0	100.0	0.0		0.0	100.0	0.0		0.0	82.4	D					
Other transportation	other 336	18		D		0.0	100.0		D		0.0	72.2	r	D		0.0	27.8	r	44.4	r
Furniture and related products	337	125	3.2	r	13.6	r	83.2	17.6	r	D	82.4	13.5	r	D	57.1	29.4				

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Miscellaneous	339	561	14.3	r	12.3	r	73.5	33.4	r	0.0		66.6	22.4	r	0.0		46.1	31.5	
Medical equipment and supplies	3391	238	5.9		D		85.3	26.4	r	0.0		73.6	26.3	r	0.0		37.9	35.8	r
Other miscellaneous manufacturing	3399	324	20.7	r	D		64.5	38.8	r	0.0		61.2	19.8	r	0.0		51.5	28.7	r
Nonmanufacturing industries	11, 21–23, 42–81	148,700	16.2		3.5		80.3	31.6		1.2		67.2	23.8		0.8		44.2	31.3	
Agriculture, forestry, fishing, and hunting	11	204	0.0		0.0		100.0	0.0		0.0		100.0	0.0		0.0		60.8	D	
Mining, extraction, and support activities	21	40	0.0		0.0		100.0	23.1	r	0.0		76.9	23.7	r	0.0		63.2	13.2	r
Utilities	22	14	38.5	r	0.0		61.5	r	71.4	r	0.0		D		0.0		D	D	
Construction	23	7,818	15.0		5.2		79.8		28.6		1.7	r	69.7	21.8		D	41.1	36.6	
Wholesale trade	42	7,828	12.8		5.1		82.1		28.7		D		70.6	20.0		0.7	r	49.8	29.5
Retail trade	44–45	10,439	12.7		6.3		81.0		19.8		4.5		75.7	16.4		2.4		37.5	43.8
Transportation and warehousing	48–49	2,155	23.3		3.1	r	73.6		29.5		1.3	r	69.2	13.2		0.0		40.5	46.4
Information	51	10,288	25.5		3.3		71.2		40.4		0.5		59.1	36.1		0.7	r	45.2	18.0
Publishing	511	3,934	27.1		1.8		71.1		45.0		0.5	r	54.5	38.7		0.2	r	48.7	12.5
Newspaper, periodical, book, and directory publishers	5111	315	13.7		5.7		80.5		39.0		D		60.3	18.4		D		47.9	32.7
Software publishers	5112	3,618	28.2		1.4		70.4		45.6		0.5	r	53.9	40.4		D		48.8	10.7
Telecommunications	517	1,243	20.6		7.2		72.2		31.1		0.7	r	68.2	24.4		3.1	r	38.4	34.1
Data processing, hosting, and related services	518	3,829	27.5		3.3		69.2		40.7		0.7	r	58.6	39.4		0.6	r	44.1	15.9
Other information	other 51	1,282	19.8		4.1		76.1		34.5		D		65.4	30.1		D		44.5	25.3
Finance and insurance	52	8,355	20.0		2.6		77.4		33.8		D		65.4	19.7		D		39.9	39.5
Real estate and rental and leasing	53	5,069	10.9		3.7		85.4		20.9		D		78.2	9.3		0.0		45.7	45.1
Lessors of nonfinancial intangible assets (except copyrighted works)	533	D	0.0		0.0		D		0.0		0.0		D	0.0		0.0		D	0.0
Other real estate and rental and leasing	other 53	5,068	10.9		3.7		85.4		20.9		D		78.2	9.3		0.0		45.6	45.1
Professional, scientific, and technical services	54	60,394	16.7		2.6		80.7		36.5		0.6		62.9	29.9		0.5		47.4	22.2
Legal services	5411	4,086	11.2		6.8		82.0		25.1		D		72.8	13.2		0.0		29.1	57.7
Accounting, tax preparation, bookkeeping, and payroll services	5412	7,179	16.2		2.7		81.1		29.3		1.0	r	69.7	16.2		1.1	r	54.5	28.2
Architectural, engineering, and related services	5413	4,304	14.1		1.5		84.4		29.9		0.9	r	69.2	29.0		0.9	r	56.9	13.2
Specialized design services	5414	1,106	9.4	r	7.9	r	82.7		25.9		D		73.9	20.2		0.0		43.5	36.3
Computer systems design and related services	5415	31,736	17.4		1.9		80.7		39.9		0.4		59.7	34.9		0.5		48.7	16.0
Management, scientific, and technical consulting services	5416	8,132	19.7		1.5		78.8		41.0		D		58.5	33.0		D		41.5	24.9
Scientific research and development services	5417	548	25.5		1.6	r	72.9		45.6		0.0		54.4	43.0		0.0		49.4	7.5
Advertising, public relations, and related services	5418	1,556	14.4		7.6	r	78.0		34.2		1.1		64.7	26.3		0.6	r	42.1	31.0
Other professional, scientific, and technical services	5419	1,751	14.6		D		81.4		31.8		0.0		68.2	26.7		0.0		49.1	24.2

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Management of companies and enterprises	55	55	r	0.0	0.0	100.0	0.0	0.0	100.0	0.0	0.0	D	D			
Administrative and support and waste management and remediation services	56	6,923		17.4	3.3	79.3	28.9	D	70.5	18.8	D	40.6	40.0			
Educational services	61	2,242		26.6	5.7	r	67.7	41.2	D	57.0	27.2	0.0	34.4	38.4		
Health care and social assistance	62	14,288		15.2	3.0		81.8	28.4	1.0	70.6	17.9	1.0	44.2	37.0		
Health care services	621–23	13,152		14.6	3.0		82.4	28.1	1.1	70.8	19.1	0.8	r	45.4	34.8	
Social assistance	624	1,136		22.7	D		73.4	31.1	D	68.7	D	D	30.6	61.9		
Arts, entertainment, and recreation	71	1,183		D	0.0		99.6	7.3	r	0.0	92.7	7.3	r	0.0	36.5	56.2
Accommodation and food services	72	5,872		12.9	5.9		81.2	22.1	4.2	73.7	12.9	2.7	30.1	54.3		
Other services	81	5,527		8.1	4.0	r	87.9	24.1	2.4	73.5	15.4	0.0	48.0	36.5		

D = withheld to avoid disclosing data for individual companies; data are included in higher-level totals. r = relative standard error > 50%.

NAICS = 2017 North American Industry Classification System; STEM = science, technology, engineering, and mathematics.

Note(s):

Detail may not add to total because of rounding or unavailable NAICS detail for select records beyond the 4-digit industry classification. Industry classification is based on dominant establishment payroll. Statistics are representative of companies located in the United States.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, 2019 Annual Business Survey: Data Year 2018.