

TABLE 96

Impact of artificial intelligence technology on worker types, by industry: 2016–18

(Number and percent)

Industry	NAICS code	Companies (number)	Production workers				Nonproduction workers				Supervisory workers				Nonsupervisory workers														
			Increased	Decreased	Did not change	Did not employ	Increased	Decreased	Did not change	Did not employ	Increased	Decreased	Did not change	Did not employ	Increased	Decreased	Did not change	Did not employ											
All industries	11, 21–23, 31–33, 42–81	141,159	9.8	3.3	52.5	34.4	7.1	3.8	63.6	25.5	7.6	2.6	66.5	23.3	8.3	3.5	65.9	22.3											
Manufacturing industries	31–33	6,327	14.1	8.7	67.1	10.1	11.1	4.7	75.1	9.1	8.3	3.8	79.8	8.1	9.8	5.9	74.8	9.5											
Food	311	323	14.7	r	18.4	62.9	4.0	r	28.3	r	1.5	63.6	6.6	r	9.6	r	D	84.8	4.0	r	9.0	r	10.5	r	73.0	7.4	r		
Beverage and tobacco products	312	120	19.0		15.7	53.7	11.6	r	25.0		10.0	r	60.0	D	16.4	r	0.0	73.7	9.8	r	11.7	r	15.8		66.7	D			
Textile, apparel, and leather products	313–16	156	9.0	r	D	84.6	6.4		31.9	r	4.5	r	63.6	D	7.7		D	89.7	0.0		3.8		4.5	r	90.4	D			
Wood products	321	191	8.4	r	3.1	88.4	0.0		D		D		95.3	2.6	r	D	D	97.9	D		D		3.1		94.8	D			
Paper	322	18	D		D	72.2	D		D		0.0		100.0	0.0		D	0.0	100.0	0.0		D		D		77.8	0.0			
Printing and related support activities	323	385	5.7		6.0	84.2	4.2		4.9		5.5	r	71.4	18.3	r	3.4		D	88.6	6.8		4.4		D		88.8	5.7		
Petroleum and coal products	324	4	D		0.0	D	0.0		D		0.0		D	0.0		D		D	0.0	0.0		D		0.0		D	0.0		
Chemicals	325	262	19.1		8.4	r	58.8	13.7	r	13.8		13.8	r	64.0	8.4	r	23.8	r	2.7	r	65.1	8.4	r	19.1		D	71.0	8.4	r
Pesticide, fertilizer, and other agricultural chemical manufacturing	3253	0	0.0		0.0	0.0	0.0		0.0		0.0		0.0	0.0		0.0		0.0	0.0		0.0		0.0		0.0		0.0	0.0	
Pharmaceuticals and medicines	3254	40	D		0.0	77.5	12.5	r	D		D		77.5	10.0	r	0.0		D	77.5	10.0	r	D		0.0		80.0	10.0	r	
Soap, cleaning compound, and toilet preparation manufacturing	3256	48	10.4	r	D	45.8	r	D		D		0.0	64.6	D	18.8	r	0.0	54.2	r	D	10.4	r	0.0		60.4	D			
Other chemicals	other 325	174	23.6		8.6	r	57.5	D	16.7	r	19.5	r	60.3	D	30.5	r	D	64.4	D	23.6		D		71.8	D				
Plastics and rubber products	326	236	20.2	r	5.9	69.7	4.2	r	23.8	r	5.4		67.5	3.3	r	15.8	r	2.1	r	77.9	4.2	r	23.5	r	4.7		66.4	5.5	r
Nonmetallic mineral products	327	131	5.3	r	D	87.8	D		6.9	r	3.8		84.7	D	8.4	r	D	87.0	D	8.4	r	D		85.5	D				
Primary metals	331	50	10.0		D	80.0	D		16.0	r	D		76.0	D	D		D	86.0	D	10.0		D		80.0	D				

TABLE 96

Impact of artificial intelligence technology on worker types, by industry: 2016–18

(Number and percent)

Industry	NAICS code	Companies (number)	Production workers				Nonproduction workers				Supervisory workers				Nonsupervisory workers				
			Increased	Decreased	Did not change	Did not employ	Increased	Decreased	Did not change	Did not employ	Increased	Decreased	Did not change	Did not employ	Increased	Decreased	Did not change	Did not employ	
Fabricated metal products	332	1,517	18.1	10.3	r 62.6	9.0	r 5.3	2.1	85.2	7.4	6.5	r 2.4	r 85.6	5.5	5.8	r 6.4	r 77.8	10.0	
Machinery	333	887	7.7	2.7	76.3	13.3	r 9.4	r 1.4	r 81.7	7.6	r 4.4	r 1.2	r 80.2	14.2	r 11.0	1.6	r 68.2	19.2	r
Computer and electronic products	334	442	15.2	6.1	r 62.7	16.1	19.7	5.9	r 64.8	9.5	13.0	2.3	r 74.7	10.0	r 17.1	3.8	r 68.9	10.2	r
Communications equipment	3342	55	D	0.0	80.0	14.5	r D	D	56.4	D	0.0	D	85.5	D	D	D	85.5	D	
Semiconductor and other electronic components	3344	111	7.3	r 10.9	r 62.8	19.1	r 11.7	D	77.5	3.6	r 11.6	r 0.0	69.7	18.7	r 8.1	r D	72.1	D	
Navigational, measuring, electromedical, and control instruments	3345	194	28.4	7.2	r 53.1	11.3	25.5	r 4.1	r 60.2	10.2	r 21.6	r 4.6	r 67.5	D	31.4	5.2	r 57.7	D	
Other computer and electronic products	other 334	83	D	0.0	72.3	24.1	r 15.9	r 0.0	63.4	20.7	r D	0.0	91.6	D	D	0.0	79.5	18.1	r
Electrical equipment, appliances, and components	335	212	28.3	r D	56.6	7.1	r 14.5	r 4.7	r 68.6	12.2	10.8	4.7	r 76.5	8.0	r 17.9	r D	67.5	8.0	r
Transportation equipment	336	349	11.5	r 1.7	58.3	28.6	r 11.2	r D	59.6	28.7	r 8.9	r D	62.2	28.1	r 10.9	r D	70.8	17.2	r
Automobiles, bodies, trailers, and parts	3361–63	293	10.9	r D	56.7	32.1	r 11.6	r D	55.3	32.4	r 10.2	r D	57.3	32.1	r 10.6	r D	70.0	19.1	r
Aerospace products and parts	3364	35	22.9	D	71.4	D	14.7	0.0	85.3	0.0	D	0.0	94.3	0.0	14.3	0.0	85.7	0.0	
Other transportation	other 336	19	D	D	57.9	r D	0.0	0.0	73.7	r D	0.0	0.0	73.7	r D	D	0.0	63.2	r D	
Furniture and related products	337	382	15.4	32.3	48.3	3.9	r 11.3	28.2	r 56.6	3.9	r 10.7	27.5	r 58.9	D	7.6	r 28.3	r 59.6	4.5	r
Miscellaneous	339	666	13.1	7.1	r 68.0	11.8	6.2	1.1	r 82.8	9.9	7.1	4.7	r 81.1	7.1	9.0	4.5	r 80.0	6.5	
Medical equipment and supplies	3391	284	16.3	r 10.8	r 62.4	10.5	r 6.3	r D	78.5	13.7	r 9.9	r D	75.4	6.0	r 6.0	r D	83.1	D	
Other miscellaneous manufacturing	3399	383	11.1	4.4	71.8	12.7	r 6.3	D	86.2	7.3	r 5.2	D	85.9	7.8	r 11.5	2.6	r 78.1	7.8	r

TABLE 96

Impact of artificial intelligence technology on worker types, by industry: 2016–18

(Number and percent)

Industry	NAICS code	Companies (number)	Production workers				Nonproduction workers				Supervisory workers				Nonsupervisory workers			
			Increased	Decreased	Did not change	Did not employ	Increased	Decreased	Did not change	Did not employ	Increased	Decreased	Did not change	Did not employ	Increased	Decreased	Did not change	Did not employ
Other real estate and rental and leasing	other 53	8,541	6.6	1.5	r 46.3	45.6	5.5	D	57.0	36.6	5.3	D	58.2	35.5	5.5	2.9	56.2	35.4
Professional, scientific, and technical services	54	38,008	9.4	1.0	47.5	42.1	7.8	2.2	62.0	28.0	6.9	0.9	63.4	28.8	8.1	1.4	63.6	26.9
Legal services	5411	5,965	5.1	0.5	r 42.1	52.3	3.5	2.5	r 60.2	33.8	5.0	0.0	62.3	32.7	4.0	1.6	r 63.3	31.1
Accounting, tax preparation, bookkeeping, and payroll services	5412	4,980	10.1	1.1	r 41.9	46.9	4.5	3.8	r 68.1	23.6	2.1	r 1.5	r 66.1	30.3	5.0	1.9	r 72.0	21.1
Architectural, engineering, and related services	5413	3,046	15.8	1.4	42.9	39.8	14.6	2.9	r 52.8	29.7	9.6	2.0	r 60.4	28.0	10.2	1.0	61.7	27.1
Specialized design services	5414	1,174	D	D	52.0	47.6	D	D	61.9	33.5	0.0	0.0	65.8	34.2	0.0	D	62.3	37.6
Computer systems design and related services	5415	11,681	10.5	1.5	54.0	34.0	8.6	2.1	64.7	24.6	8.4	0.9	r 68.8	21.9	9.5	1.2	66.9	22.4
Management, scientific, and technical consulting services	5416	6,676	9.8	D	49.1	40.9	9.8	0.3	r 60.5	29.4	10.1	1.2	r 54.5	34.2	11.9	0.9	r 54.4	32.8
Scientific research and development services	5417	861	11.7	1.4	r 45.8	41.0	19.2	1.5	63.3	16.1	11.6	1.3	r 69.8	17.3	17.4	1.5	60.8	20.2
Advertising, public relations, and related services	5418	1,365	7.6	r 1.8	45.9	44.8	11.3	1.0	53.6	34.1	5.8	0.7	60.0	33.5	7.8	0.9	62.3	29.0
Other professional, scientific, and technical services	5419	2,263	9.1	D	40.7	48.4	4.6	r 3.8	r 60.5	31.1	4.1	r D	60.2	35.6	5.7	r 3.6	r 60.6	30.1
Management of companies and enterprises	55	91	r 0.0	0.0	D	D	D	0.0	41.8	r 0.0	D	0.0	41.8	r 0.0	0.0	0.0	100.0	0.0
Administrative and support and waste management and remediation services	56	7,687	11.9	2.9	47.8	37.4	8.0	5.2	60.4	26.4	8.6	2.9	64.3	24.2	11.2	2.4	r 63.4	23.0

TABLE 96

Impact of artificial intelligence technology on worker types, by industry: 2016–18

(Number and percent)

Industry	NAICS code	Companies (number)	Production workers				Nonproduction workers				Supervisory workers				Nonsupervisory workers										
			Increased	Decreased	Did not change	Did not employ	Increased	Decreased	Did not change	Did not employ	Increased	Decreased	Did not change	Did not employ	Increased	Decreased	Did not change	Did not employ							
Educational services	61	1,564	8.0	r	D	38.7	50.4	6.4	r	D	51.7	36.4	9.9		D	62.7	24.6	16.8	r	10.9		52.2	20.1		
Health care and social assistance	62	16,796	7.8		3.0	52.0	37.2	2.6		3.4	67.8	26.2	5.0		2.3	68.1	24.6	5.6		4.5		69.2	20.7		
Health care services	621–23	15,746	7.0		2.7	53.3	37.0	2.8		3.4	68.2	25.6	4.5		2.2	68.9	24.4	5.7		4.0		69.7	20.6		
Social assistance	624	1,051	19.7		D	32.6	39.5	0.0		D	60.6	35.2	12.0	r	D	56.3	27.3	D		12.4	r	60.1	23.5		
Arts, entertainment, and recreation	71	1,442		D	D	49.2	50.6	0.6		D	61.6	37.7		D	3.6	r	71.8	21.8	3.5	r	6.8	r	67.9	21.8	
Accommodation and food services	72	8,936	15.1		8.2	57.9	18.8	6.4		10.2	61.3	22.1	9.9		6.3	68.1	15.7	7.8		8.2		64.7	19.3		
Other services	81	6,055	5.1		3.3	r	56.9	34.7	3.8	r	3.2	r	60.7	32.3	3.1	r	2.8	65.4	28.7	2.2	r	3.5	r	66.7	27.6

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.

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.