TABLE 134

Impact of producing robotics or goods or services with robotics 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	15,043	16.1	5.9	78.0	30.6	2.6	66.8	28.5	1.4 r	43.9	26.2
Manufacturing industries	31–33	2,968	19.4	11.2	69.4	46.0	1.9 r	52.1	45.9	D	43.1	10.6
Food	311	50	D	D	82.0	10.0 r	D	86.0	12.0 r	0.0	54.0 r	D
Beverage and tobacco products	312	9	D	D	D	D	0.0	77.8	D	0.0	77.8	0.0
Textile, apparel, and leather products	313–16	17 r	D	D	D	D	D	D	D	D	0.0	D
Wood products	321	72 r	D	D	30.6 r	D	0.0	95.8	D	0.0	73.6 r	D
Paper	322	11	0.0	D	81.8	D	0.0	81.8	50.0	0.0	50.0	0.0
Printing and related support activities	323	56	D	D	76.8	48.2	D	44.6	21.8 r	0.0	38.2 r	40.0 r
Petroleum and coal products	324	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chemicals	325	49	D	D	67.3 r	17.0 r	0.0	83.0	20.4 r	0.0	71.4	D
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
Pharmaceuticals and medicines	3254	D	D	D	0.0	D	D	0.0	D	D	0.0	0.0
Soap, cleaning compound, and toilet preparation manufacturing	3256	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other chemicals	other 325	44	0.0	D	68.2 r	D	0.0	86.4	D	0.0	79.5	D
Plastics and rubber products	326	217	3.2 r	53.7 r	43.1 r	47.2 r	0.0	52.8 r	64.4	0.0	9.6	26.0 r
Nonmetallic mineral products	327	13	D	0.0	53.8 r	69.2	D	D	D	0.0	53.8 r	0.0
Primary metals	331	56 r	D	D	92.9 r	D	0.0	98.2 r	D	0.0	94.6 r	0.0
Fabricated metal products	332	539	19.4 r	7.6 r	73.0	45.1	D	48.2	51.3	0.0	40.2	8.5 r
Machinery	333	1,047	31.4	1.6	67.0	58.7	0.0	41.3	55.2	0.0	38.8	6.0 r
Computer and electronic products	334	316	20.0 r	6.6 r	73.4	37.3	D	61.4	32.6	D	59.8	6.6 r
Communications equipment	3342	8 r	D	0.0	50.0 r	D	0.0	50.0 r	D	0.0	50.0 r	0.0
Semiconductor and other electronic components	3344	77	10.4 r	D	83.1	27.3 r	D	70.1	9.1 r	D	80.5	D
Navigational, measuring, electromedical, and control instruments	3345	214	21.0 r	D	71.0	41.9	0.0	58.1	40.3	0.0	51.8	7.8 r
Other computer and electronic products	other 334	16	33.4 r	0.0	66.6 r	D	0.0	81.3	D	0.0	81.3	0.0
Electrical equipment, appliances, and components	335	91	23.1	D	74.7	35.6	0.0	64.4	36.6	0.0	53.7	9.7 r
Transportation equipment	336	149	5.4	22.1 r	72.5	35.4 r	0.0	64.6 r	33.8 r	0.0	50.0 r	16.2 r
Automobiles, bodies, trailers, and parts	3361–63	121	4.1	25.8 r	70.0 r	33.6 r	0.0	66.4 r	33.1 r	0.0	49.6 r	17.4 r
Aerospace products and parts	3364	25	D	D	80.0	50.0 r	0.0	50.0 r	46.2 r	0.0	53.8 r	0.0
Other transportation	other 336	D	0.0	0.0	D	0.0	0.0	D	0.0	0.0	D	D
Furniture and related products	337	86 r	D	D	88.4	72.1 r	D	25.6 r	69.8 r	0.0	23.3 r	D

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Miscellaneous	339	186	4.8 r	D	89.2	43.0 r	D	57.0	41.7 r	0.0	48.2	10.1 r
Medical equipment and supplies	3391	157	3.8 r	D	88.5	48.4 r	D	50.3 r	48.7 r	0.0	41.6 r	9.7 r
Other miscellaneous manufacturing	3399	30	D	0.0	93.3	D	0.0	93.3	D	0.0	76.7	D
Nonmanufacturing industries	11, 21–23, 42–81	12,076	15.3	4.6	80.1	26.9	2.8	70.3	24.2	1.7 r	44.0	30.0
Agriculture, forestry, fishing, and hunting	11	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mining, extraction, and support activities	21	D	0.0	0.0	D	D	0.0	D	D	0.0	D	0.0
Utilities	22	D	0.0	0.0	D	D	0.0	D	D	0.0	D	0.0
Construction	23	744	17.5 r	D	77.3	26.6	D	62.2	29.7	D	23.9	41.0
Wholesale trade	42	2,288	9.9	2.5 r	87.6	20.7	0.4 r	78.9	18.3	0.0	52.7	29.0
Retail trade	44–45	1,725	17.6	11.8	70.6	21.7	D	74.5	11.3 r	D	51.8	34.5
Transportation and warehousing	48–49	69 r	15.9 r	D	78.3 r	24.6 r	0.0	75.4 r	15.9 r	0.0	D	78.3 r
Information	51	332	24.1 r	D	73.8	46.1 r	0.0	53.9	34.3 r	D	59.6	5.7
Publishing	511	63	57.1 r	D	34.9 r	65.6 r	0.0	34.4 r	65.6 r	0.0	34.4 r	0.0
Newspaper, periodical, book, and directory publishers	5111	D	D	0.0	0.0	D	0.0	0.0	D	0.0	0.0	0.0
Software publishers	5112	59	54.2 r	D	37.3 r	63.3 r	0.0	36.7 r	63.3 r	0.0	36.7 r	0.0
Telecommunications	517	14 r	D	0.0	D	D	0.0	D	D	D	D	0.0
Data processing, hosting, and related services	518	54	56.4	0.0	43.6 r	56.4	0.0	43.6	27.3 r	0.0	72.7	0.0
Other information	other 51	201 r	4.0	0.0	96.0	37.1 r	0.0	62.9 r	25.2 r	0.0	65.3 r	9.4 r
Finance and insurance	52	178	30.3 r	D	69.7	30.5 r	0.0	69.5	29.8 r	0.0	48.9 r	D
Real estate and rental and leasing	53	183 r	D	0.0	77.0	D	0.0	77.0	D	0.0	77.0	0.0
Lessors of nonfinancial intangible assets (except copyrighted works)	533	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other real estate and rental and leasing	other 53	183 r	D	0.0	77.0	D	0.0	77.0	D	0.0	77.0	0.0
Professional, scientific, and technical services	54	2,729	18.8	1.5	79.7	34.2	0.6 r	65.2	35.8	D	50.2	13.9
Legal services	5411	D	0.0	0.0	D	0.0	0.0	D	0.0	0.0	0.0	D
Accounting, tax preparation, bookkeeping, and payroll services	5412	5	D	0.0	D	D	0.0	D	D	0.0	D	0.0
Architectural, engineering, and related services	5413	1,314	19.2	2.1 r	78.7	26.8	D	72.2	31.9	D	63.3	4.6 r
Specialized design services	5414	5	0.0	D	D	0.0	D	D	0.0	0.0	100.0	0.0
Computer systems design and related services	5415	783	19.2	D	80.2	31.6	0.0	68.4	26.6	0.0	51.2	22.2
Management, scientific, and technical consulting services	5416	321	12.8 r	D	86.9	65.0	0.0	35.0 r	68.8	0.0	21.2 r	D
Scientific research and development services	5417	159	34.6	D	62.3	53.5	D	44.7	57.2	D	37.1	4.4 r
Advertising, public relations, and related services	5418	12	D	0.0	75.0	66.7	0.0	33.3 r	D	0.0	D	D
Other professional, scientific, and technical services	5419	79 r	D	0.0	D	D	0.0	D	D	0.0	0.0	D

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Management of companies and enterprises	55	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Administrative and support and waste management and remediation services	56	772	19.6	0.0	80.4	17.7 r	0.0	82.3	7.4 r	0.0	40.5	52.1
Educational services	61	170 r	0.0	0.0	100.0	D	0.0	75.9	0.0	0.0	50.6 r	D
Health care and social assistance	62	1,188	15.0	0.0	85.0	42.6	0.0	57.4	32.3	0.0	29.6	38.2
Health care services	621−23	1,146	15.5	0.0	84.5	40.5	0.0	59.5	29.8	0.0	30.6	39.5
Social assistance	624	D	0.0	0.0	D	D	0.0	0.0	D	0.0	0.0	0.0
Arts, entertainment, and recreation	71	179 r	0.0	0.0	100.0	D	0.0	74.3	D	0.0	D	0.0
Accommodation and food services	72	754	D	22.0 r	64.5	D	22.0	64.5	21.1	D	D	49.1
Other services	81	757	D	D	87.1	21.0	0.0	79.0	27.1	0.0	38.2	34.7

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.