

TABLE 139

## Factors adversely affecting production of artificial intelligence or goods or services that included artificial intelligence, by industry: 2016–18

(Number and percent)

Industry	NAICS code	Companies (number)	This technology was too expensive	The technology was not mature	Lacked access to required data	Required data not reliable	Lacked access to required human capital and talent	Laws and regulations	Concerns regarding safety and security (physical and/or cybersecurity)	Lacked access to capital	Technology not applicable to this business	No factors adversely affected the adoption of this technology
All industries	11, 21–23, 31–33, 42–81	4,805,151	5.4	1.1	0.5	0.3	0.7	0.4	0.6	0.8	48.0	43.2
Manufacturing industries	31–33	217,565	9.2	1.1	0.6	0.3	1.8	0.3	0.5	1.9	43.4	43.5
Food	311	18,250	9.2	1.1	0.4 r	0.3 r	1.0	0.3 r	0.6 r	1.4	47.2	40.5
Beverage and tobacco products	312	7,723	7.7	1.1	0.9 r	0.3	1.3	0.3	0.2	1.7	40.1	47.9
Textile, apparel, and leather products	313–16	10,554	10.0	0.6	0.4	0.2	1.6	0.1 r	0.6 r	1.5	43.5	43.0
Wood products	321	11,012	7.6	0.4	0.5 r	0.2 r	0.9	D	0.1 r	0.6 r	45.2	43.4
Paper	322	2,117	8.3	0.6	D	0.3 r	1.2 r	0.0	1.3 r	3.1 r	53.3	37.5
Printing and related support activities	323	20,851	8.1	0.6	0.2	0.2	0.8	0.1 r	0.4	1.0	44.1	44.9
Petroleum and coal products	324	583	8.7 r	D	D	D	0.7	4.5 r	3.8 r	0.0	41.5	52.0
Chemicals	325	7,522	9.9	1.3	0.8 r	0.6 r	2.1	0.4	0.3	2.9	41.4	44.0
Pesticide, fertilizer, and other agricultural chemical manufacturing	3253	593	7.3 r	1.9 r	0.0	0.0	0.0	0.0	D	D	46.5	44.2
Pharmaceuticals and medicines	3254	1,365	8.1	1.3	D	D	0.8	0.3 r	D	3.6	44.5	41.9
Soap, cleaning compound, and toilet preparation manufacturing	3256	1,636	12.1	0.2	0.8 r	0.4 r	5.3	0.2	0.4	6.4	37.7	45.8
Other chemicals	other 325	3,927	9.9	1.7 r	1.1 r	0.8 r	1.5 r	0.5	0.4	1.5 r	41.1	44.0
Plastics and rubber products	326	8,087	13.0	2.0	0.7	0.2 r	4.7	0.2 r	1.1 r	4.7	40.5	40.5
Nonmetallic mineral products	327	7,749	6.8	0.5	0.3	0.3	0.8	0.3 r	0.1	1.3	48.6	42.2
Primary metals	331	2,537	9.5	1.4	1.2 r	0.3	1.3	0.4 r	0.7	1.4	39.1	45.4
Fabricated metal products	332	48,472	10.3	1.0	0.4	0.2 r	1.8	0.3	0.5	2.2	42.6	43.9
Machinery	333	18,558	8.9	1.3	1.1 r	0.2	3.6	0.3	0.7 r	1.7	43.9	42.2
Computer and electronic products	334	9,036	7.1	2.7	1.6	0.9	2.3	1.0	1.1	3.3	40.6	46.0
Communications equipment	3342	974	7.4	0.6 r	2.1 r	D	1.6 r	2.0 r	2.1 r	4.0	41.9	46.0
Semiconductor and other electronic components	3344	2,796	6.9	3.9	1.4 r	1.5 r	2.5	0.2 r	0.7	2.3	41.8	44.0
Navigational, measuring, electromedical, and control instruments	3345	3,909	7.3	2.8	1.8	0.5	2.7	1.5 r	1.1	4.4	39.5	46.7
Other computer and electronic products	other 334	1,359	6.8	1.1 r	1.1 r	0.5	1.3 r	D	0.9	1.8 r	40.5	47.8
Electrical equipment, appliances, and components	335	4,000	9.1	1.7	1.5 r	0.4	3.0 r	0.3 r	1.1	1.7	41.7	43.5
Transportation equipment	336	7,175	9.6	1.1	1.0 r	0.9 r	3.3	0.4	1.0 r	2.0	41.8	44.4
Automobiles, bodies, trailers, and parts	3361–63	4,565	10.7	1.0	1.3 r	1.2 r	4.3	0.4	1.2 r	1.8	39.9	44.7

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Aerospace products and parts	3364	985	7.7	2.3	1.1	0.5	2.3	D	1.5 r	3.8	39.4	48.4
Other transportation	other 336	1,625	7.8	0.7 r	D	0.4	0.9 r	0.5	0.0	1.6 r	48.4	41.2
Furniture and related products	337	12,647	9.2	1.0	0.4	0.2	2.2	0.1	0.4	2.0	43.1	43.0
Miscellaneous	339	20,669	8.9	1.6	0.4	0.4 r	1.3	0.4	0.3	1.7	43.0	44.3
Medical equipment and supplies	3391	8,060	10.9	1.6	0.3 r	0.1 r	0.8	0.5 r	0.2	2.3 r	42.1	43.2
Other miscellaneous manufacturing	3399	12,608	7.7	1.6 r	0.4	0.5 r	1.6 r	0.3 r	0.3 r	1.3	43.6	44.9
Nonmanufacturing industries	11, 21–23, 42–81	4,587,586	5.2	1.1	0.5	0.3	0.7	0.4	0.6	0.8	48.3	43.2
Agriculture, forestry, fishing, and hunting	11	21,606	4.0	0.4 r	D	D	D	0.5 r	0.4 r	0.7 r	54.5	38.9
Mining, extraction, and support activities	21	14,969	3.9	0.8	1.0 r	0.1	0.8 r	0.1	0.4 r	0.6	48.7	44.3
Utilities	22	2,684	4.1 r	0.7	0.2 r	0.2	0.7 r	0.2	0.6	0.7 r	49.7	43.3
Construction	23	613,110	4.5	0.4	0.3	0.2	0.5	0.2	0.3	0.5	51.9	41.2
Wholesale trade	42	257,153	6.4	1.0	0.6	0.2	0.8	0.3	0.5	0.9	47.6	42.5
Retail trade	44–45	560,952	6.6	0.6	0.5	0.2	0.6	0.2	0.4	0.8	48.8	42.2
Transportation and warehousing	48–49	152,463	6.0	0.9	0.4	0.3	0.5	0.9	0.6	0.8	47.3	42.5
Information	51	61,638	4.6	3.2	1.2	0.7	2.1	0.4	0.6	2.0	41.9	46.6
Publishing	511	17,590	5.1	3.9	1.8	0.4	2.3	0.5	0.6	2.4	39.9	48.0
Newspaper, periodical, book, and directory publishers	5111	9,761	5.0	0.8	0.4	0.1	1.0	0.4 r	0.7 r	1.1 r	45.3	46.3
Software publishers	5112	7,828	5.3	7.7	3.5	0.7	3.8	0.5 r	0.5	4.0	33.4	50.1
Telecommunications	517	7,164	6.7	1.5	0.9 r	0.9	1.3 r	0.5 r	0.8	2.0	40.9	47.3
Data processing, hosting, and related services	518	8,918	5.3	5.8	2.4	1.3	4.3	0.6	0.7	3.8	34.7	48.6
Other information	other 51	27,965	3.6	2.4	0.6	0.6	1.6	0.2	0.5	1.2	45.6	45.0
Finance and insurance	52	200,857	3.7	1.1	0.5	0.2	0.7	1.1	1.1	0.7	41.2	50.3
Real estate and rental and leasing	53	255,783	3.3	1.0	0.4	0.4	0.3	0.4	0.3	0.6	48.2	45.6
Lessors of nonfinancial intangible assets (except copyrighted works)	533	1,812	D	9.3 r	D	D	D	0.0	0.0	10.9	36.5	46.1
Other real estate and rental and leasing	other 53	253,970	3.3	0.9	0.4	0.4	0.3	0.4	0.3	0.5	48.3	45.6
Professional, scientific, and technical services	54	695,672	4.3	2.3	0.7	0.4	1.2	0.5	0.8	1.1	45.5	45.3
Legal services	5411	152,243	3.1	1.4	0.5	0.3	0.7	0.3	0.8	0.6	50.6	42.3

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Accounting, tax preparation, bookkeeping, and payroll services	5412	106,634	5.2	1.9	0.3	0.4	0.6	0.8	1.5	0.6	40.7	48.8
Architectural, engineering, and related services	5413	88,491	4.2	2.0	0.6	0.3	1.2	0.2	0.6	1.1	49.9	42.2
Specialized design services	5414	26,282	4.4	1.1	0.3 r	D	0.7	D	0.3 r	0.9	55.3	38.0
Computer systems design and related services	5415	95,950	6.0	5.9	1.7	1.0	3.1	0.8	1.4	2.9	35.1	49.8
Management, scientific, and technical consulting services	5416	132,989	3.7	2.1	0.5	0.3	1.1	0.4	0.4	1.0	45.0	46.7
Scientific research and development services	5417	9,798	4.5	4.1	1.7	1.1	2.2	0.5	1.1	2.6	43.8	43.2
Advertising, public relations, and related services	5418	27,677	4.3	1.5	0.5	0.3 r	0.9	0.2 r	0.4	1.2	47.0	45.8
Other professional, scientific, and technical services	5419	55,569	4.5	1.1	0.4	0.1 r	0.9	0.5	0.5	0.7	48.1	43.9
Management of companies and enterprises	55	2,409	D	D	D	0.0	D	0.0	0.0	0.0	38.9	57.1
Administrative and support and waste management and remediation services	56	287,807	5.4	0.8	0.4	0.3	0.6	0.3	0.6	0.8	49.3	42.5
Educational services	61	53,912	3.4	0.6	0.2 r	0.3 r	0.5	D	0.5	1.0	52.3	41.9
Health care and social assistance	62	519,556	5.4	1.5	0.5	0.3	0.6	0.8	0.9	0.8	48.9	42.1
Health care services	621–23	459,855	5.5	1.7	0.5	0.3	0.6	0.8	1.0	0.8	48.5	42.5
Social assistance	624	59,700	4.8	0.6	0.2 r	0.3 r	0.5	0.4	0.8	0.9	52.2	39.0
Arts, entertainment, and recreation	71	88,831	3.2	0.4	0.2	D	0.3	D	0.4	0.3	50.5	44.7
Accommodation and food services	72	453,059	7.0	0.9	0.6	0.3	0.6	0.3	0.5	0.8	47.9	42.2
Other services	81	345,125	5.8	0.5	0.4	0.2	0.5	0.3	0.5	0.8	49.8	41.9

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

NAICS = 2017 North American Industry Classification System.

**Note(s):**

Detail may not add to total because of rounding. Detail may exceed total because companies could select more than one response. 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.