

TABLE 22

**Companies with domestic R&D paid for by the company and others and performed by the company in the artificial intelligence technology focus area, by industry and company size: 2021**

(Millions of U.S. dollars and number of companies)

Industry and company size	NAICS code	Domestic R&D		Artificial intelligence R&D											
		Companies <sup>a</sup> (number)	Amount	Total		Paid for by the company		Paid for by others							
				Companies <sup>a</sup> (number)	Amount	Companies <sup>a</sup> (number)	Amount	Companies <sup>a</sup> (number)	Amount						
All industries	21-23, 31-33, 42-81	31,490	602,499	3,790	i	28,875	i	3,380	i	25,267	i	610	i	3,609	i
Manufacturing industries	31-33	15,620	326,060	1,220	i	10,716	i	1,180	i	10,079	i	90		637	
Food	311	890	5,266	40	i	48		40	i	47		10		1	
Beverage and tobacco products	312	190	1,247	0		0		0		0		0		0	
Textile, apparel, and leather products	313-16	310	829	10	r	16	r	10	r	16	r	0		0	
Wood products	321	150	444	10		0 - 28		10		0 - 28		0		0	
Paper	322	120	1,139	10	i	32	i	10	i	32	i	0		0	
Printing and related support activities	323	170	204	i	10	0 - 28		10		0 - 28		0		0	
Petroleum and coal products	324	110	957	0		0		0		0		0		0	
Chemicals	325	2,250	109,490	60	i	448	i	50	i	444	i	10		4	
Basic chemicals	3251	250	2,713	10		15		10		12		10		3	
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	130	1,389	i	10	0 - 36	i	10		0 - 36	i	0		0	
Pesticide, fertilizer, and other agricultural chemicals	3253	100	1,157	10		1		10		1		0		0	
Pharmaceuticals and medicines	3254	1,210	100,220	30		397	i	20		397	i	10		*	
Soap, cleaning compound, and toilet preparations	3256	290	2,740	10		1		10		1		0		0	
Paint, coating, adhesive, and other chemicals	3255, 3259	300	1,271	30	i	0 - 37		30	i	0 - 36		10		1	
Plastics and rubber products	326	920	3,144	20		6		20		6		10	i	*	i
Nonmetallic mineral products	327	340	1,533	20	i	37	i	20	i	37	i	0		0	
Primary metals	331	260	912	10		0 - 28	i	10		0 - 28	i	0		0	
Fabricated metal products	332	2,310	4,291	300	i	72		300	i	72		0		0	
Machinery	333	2,170	17,730	170	i	834		170	i	817		10		17	
Agricultural implement	33311	150	1,867	30	i	54		30	i	54		0		0	
Semiconductor machinery	333242	60	5,349	20	i	581		20	i	572		10		10	
Engine, turbine, and power transmission equipment	3336	80	1,374	20	i	27	i	20	i	24	i	10		2	
Other machinery	other 333	1,900	9,140	120	i	172		120	i	167		10		5	
Computer and electronic products	334	2,130	101,063	400	i	6,874	i	380	i	6,522	i	40	i	352	
Communications equipment	3342	280	12,557	20		68 - 207		20		69		10	i	137	
Semiconductor and other electronic components	3344	660	47,396	140	i	4,115	i	130	i	3,907	i	30	i	208	
Navigational, measuring, electromedical, and control instruments	3345	960	13,644	200	i	441 - 580		200	i	434	i	20		145	
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	180	3,087	40	i	195	i	40	i	188	i	10		7	
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	190	5,301	50	i	203		50	i	65 - 204		10		0 - 137	

TABLE 22

## Companies with domestic R&amp;D paid for by the company and others and performed by the company in the artificial intelligence technology focus area, by industry and company size: 2021

(Millions of U.S. dollars and number of companies)

Industry and company size	NAICS code	Domestic R&D		Artificial intelligence R&D										
		Companies <sup>a</sup> (number)	Amount	Total		Paid for by the company		Paid for by others						
				Companies <sup>a</sup> (number)	Amount	Companies <sup>a</sup> (number)	Amount	Companies <sup>a</sup> (number)	Amount					
Other measuring and controlling devices	other 3345	600	5,256	120	i	43 - 183	i	120	i	41 - 181	i	10		2
Other computer and electronic products	other 334	240	27,465	50	i	2,111 - 2,236		50	i	2,112		10		0 - 124
Electrical equipment, appliances, and components	335	580	5,494	90	i	321	i	90	i	236	i	10	i	85
Transportation equipment	336	1,150	50,760	50		1,525		50	i	1,350		10		175
Motor vehicles, bodies, trailers, and parts	3361-63	570	26,391	30		1,147		30		1,129		10		18
Aerospace products and parts	3364	350	21,468	20	i	373	i	20	i	215	i	10	i	157
Aircraft, aircraft engine, and aircraft parts	336411-13	310	19,845	20	i	372	i	20	i	214	i	10	i	157
Guided missile, space vehicle, and related parts	336414-15, 336419	40	1,623	10	i	1		10	i	1		0		0
Military armored vehicle, tank, and tank components	336992	20	21 - 25	0		0		0		0		0		0
Other transportation	other 336	220	2,875 - 2,880	20	i	5		20	i	5		0		0
Furniture and related products	337	230	426	10	i	1	i	10	i	1	i	0		0
Miscellaneous	339	1,450	21,133	100	i	480 - 509		90	i	477 - 506		20	i	3
Medical equipment and supplies	3391	820	18,438	90	i	481		80	i	477		20	i	3
Other miscellaneous manufacturing	3399	640	2,695	10		0 - 28		10		0 - 28		0		0
Nonmanufacturing industries	21-23, 42-81	15,880	276,439	2,570	i	18,159	i	2,210	i	15,188	i	520	i	2,971
Mining, quarrying, oil and gas extraction, and support activities	21	180	1,260 - 1,334	20	i	16		20	i	16		0		0
Utilities	22	40	168 - 17,997	10		23		10		23		0		0
Wholesale trade	42	1,810	1,745 - 1,855	20	i	6	i	20	i	6	i	0		0
Electronic shopping and electronic auctions	454111-12	180	5,936 - 24,040	10	i	0 - 1,769	i	10	i	0 - 1,769	i	0		0
Transportation and warehousing	48-49	80	7,208	10		0 - 1,769		10		0 - 1,769		0		0
Information	51	3,450	147,855	910	i	9,982	i	870	i	9,868	i	80	i	114
Publishing	511	1,420	39,152	400	i	2,364		380	i	2,316		50	i	48
Newspaper, periodical, book, and directory publishers	5111	60	103	10		1		10		1		0		0
Software publishers	5112	1,370	39,049	390	i	2,364		380	i	2,316		50	i	48
Telecommunications	517	170	3,835	80	i	338		80	i	270 - 339		10		0 - 67
Data processing, hosting, and related services	518	1,700	45,192	420	i	2,901	i	400	i	2,833 - 2,902	i	30	i	0 - 67
Other information	other 51	180	59,676	30		4,379	i	30		4,311 - 4,380	i	10		0 - 67

TABLE 22

**Companies with domestic R&D paid for by the company and others and performed by the company in the artificial intelligence technology focus area, by industry and company size: 2021**

(Millions of U.S. dollars and number of companies)

Industry and company size	NAICS code	Domestic R&D		Artificial intelligence R&D							
				Total		Paid for by the company		Paid for by others			
		Companies <sup>a</sup> (number)	Amount	Companies <sup>a</sup> (number)	Amount	Companies <sup>a</sup> (number)	Amount	Companies <sup>a</sup> (number)	Amount		
Finance and insurance	52	530	r 20,947	120	r 853	120	r 847	10		6	
Real estate and rental and leasing	53	50	2,096	10	0 - 1,769	10	0 - 1,769	0		0	
Lessors of nonfinancial intangible assets (except copyrighted works)	533	10	5 - 8	0	0	0	0	0		0	
Other real estate and rental and leasing	other 53	40	2,088 - 2,091	10	0 - 1,769	10	0 - 1,769	0		0	
Professional, scientific, and technical services	54	7,050	66,496	1,460	i 5,487	i 1,130	i 2,636	i 450	i 2,850	i	
Architectural, engineering, and related services	5413	1,430	4,560	160	i 171	i 90	i 75	i 80	i 95		
Computer systems design and related services	5415	3,390	20,409	910	i 1,717	i 780	i 1,158	i 190	i 559	i	
Scientific research and development services	5417	1,370	34,142	i 260	i 2,739	i 160	i 643	i 160	i 2,096	i	
Research and development in nanotechnology	541713	70	228	10	i 13	i 10	i 13	i 10	i *	i	
Research and development in biotechnology (except nanobiotechnology)	541714	310	9,039	20	19	20	11	10	9		
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	980	24,312	i 230	i 2,665	i 130	i 617	i 150	i 2,048	i	
Research and development in the social sciences and humanities	541720	30	563	10	42	10	3	10	40		
Other professional, scientific, and technical services	other 54	870	7,385	140	i 860	i 120	i 760	i 40	i 101		
Health care services	621-23	590	r 2,060 - 2,138	20	i 27	20	i 27	0	0		
Other nonmanufacturing	23, 44-45 (excluding 454111-12), 55-56, 624, 71-72, 81	1,980	2,564 - 3,199	30	0 - 1,769	30	0 - 1,769	0	0		
All companies (number of domestic employees)	-	31,490	602,499	3,790	i 28,875	i 3,380	i 25,267	i 610	i 3,609	i	
Small companies											
10-19 <sup>b</sup>	-	5,690	5,477	910	i 342	i 760	i 273	i 210	i 69	i	
20-49	-	9,210	15,061	1,280	i 779	1,160	i 652	180	i 128	i	
Medium companies											
50-99	-	5,760	14,540	540	i 848	490	i 692	80	i 156		
100-249	-	5,570	24,023	450	i 1,114	400	i 876	80	i 239		
Large companies											
250-499	-	2,050	23,932	190	i 1,436	170	i 858	30	577		
500-999	-	1,290	27,432	120	1,792	120	1,547	10	i 245		
1,000-4,999	-	1,350	94,615	190	2,449	180	2,367	20	82		
5,000-9,999	-	270	62,817	60	3,899	i 60	3,380	i 10	519	i	
10,000-24,999	-	210	104,607	50	3,875	i 40	2,648	i 10	1,227	i	
25,000 or more	-	130	229,995	40	12,341	i 40	11,974	i 10	367		

\* = amount < \$500,000; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%.

NAICS = 2017 North American Industry Classification System.

<sup>a</sup> Beginning in survey year 2018, these statistics include an adjustment to the weight to account for unit nonresponse.

<sup>b</sup> The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

**Note(s):**

Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D and are not comparable with estimates published for years prior to 2018. Companies could report R&D in one, more than one, or no application area. An estimate range may be displayed in place of a single estimate to avoid disclosing operations of individual companies.

**Source(s):**

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2021.