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Public Predictions for the Future of Workforce Automation

A majority of Americans predict that within 50 years, robots and computers will do much of the work currently done by humans – but few workers expect their own jobs or professions to experience substantial impacts

BY Aaron Smith

FOR MEDIA OR OTHER INQUIRIES:

Aaron Smith, Associate Director, Research
Dana Page, Senior Communications Manager

202.419.4372

www.pewresearch.org

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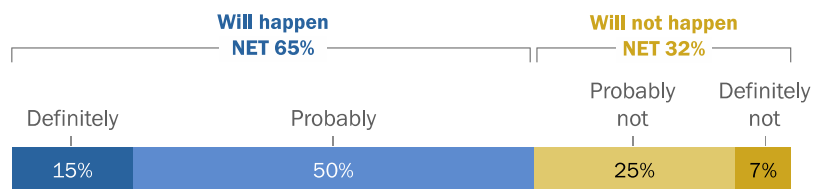
From self-driving vehicles and semi-autonomous robots to intelligent algorithms and predictive analytic tools, machines are increasingly capable of performing a wide range of jobs that have long been human domains. A [2013 study](#) by researchers at Oxford University posited that as many as 47% of all jobs in the United States are at risk of “computerization.” And many respondents in a recent Pew Research Center

[canvassing of technology experts](#) predicted that advances in robotics and computing applications will result in a net displacement of jobs over the coming decades – with potentially profound implications for both workers and society as a whole.

The ultimate extent to which robots and algorithms intrude on the human workforce will depend on a host of factors, but many Americans expect that this shift will become reality over the next half-century. In a national survey by Pew Research Center conducted June 10-July 12, 2015, among 2,001 adults, fully 65% of Americans expect that within 50 years robots and computers will “definitely” or “probably” do much of the

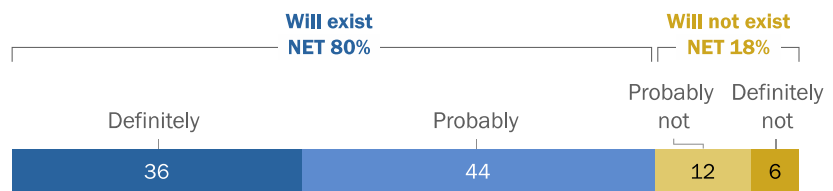
Two-thirds of Americans expect that robots and computers will do much of the work currently done by humans within 50 years ...

% of adults who say that in the next 50 years robots and computers will do much of the work currently done by humans



... but most workers expect that their own jobs will exist in their current forms in five decades

% of workers who say the jobs/professions they work in now will/will not exist in 50 years



Note: Second chart based on those who are currently employed on a full- or part-time basis

Source: Survey conducted June 10-July 12, 2015.

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work currently done by humans.

Yet even as many Americans expect that machines will take over a great deal of human employment, an even larger share (80%) expect that *their own* jobs or professions will remain largely unchanged and exist in their current forms 50 years from now. And although 11% of today’s workers are at least somewhat concerned that they might lose their jobs as a result of workforce automation, a larger number are occupied by more immediate worries – such as displacement by lower-paid human workers, broader industry trends or mismanagement by their employers.

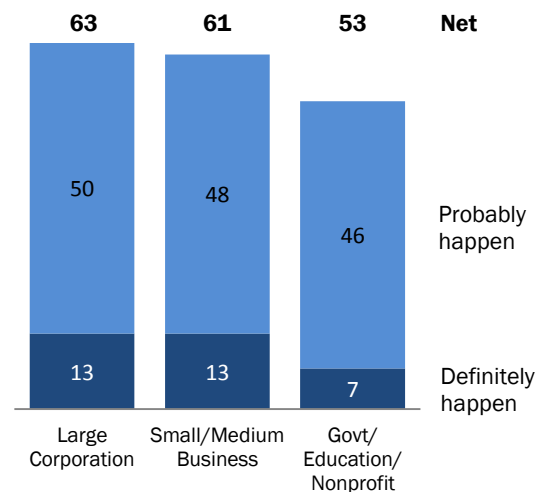
Two-thirds of Americans think it’s likely that in 50 years, robots and computers will do much of the work currently done by humans

When it comes to their general predictions for the future of human employment and workforce automation, roughly two-thirds of Americans expect that within the next 50 years robots and computers will do much of the work currently done by humans. Some 15% of Americans expect that this level of automation will “definitely” happen, while 50% think it will “probably” happen. On the other hand, one-quarter of Americans expect that this outcome will probably not happen, and 7% believe it will definitely not happen.

In general, Americans of various demographic backgrounds have largely similar expectations regarding the future of automation. However, those under the age of 50 – as well as those with relatively high household incomes and levels of educational attainment – are a bit more skeptical than average about the likelihood of widespread workforce automation. Some 35% of 18- to 49-year-olds think it *unlikely* that robots and computers will do much of the work done by humans, compared with 27% of those ages 50 and older. And 37% of those with a college degree think that this outcome is unlikely (compared with 28% of those who have not attended college), as do 38%

Government, education and nonprofit workers are slightly more skeptical about the likelihood of widespread workforce automation

% of workers in each group who say that in 50 years robots and computers will do much of the work currently done by humans



Source: Survey conducted June 10 – July 12, 2015

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of Americans with an annual household income of \$75,000 or more (compared with 27% of those with an annual household income of less than \$30,000 per year).

Similarly, Americans who work in the government, nonprofit or education sectors are a bit more skeptical about the future of workforce automation than are Americans who work for a large corporation, medium-sized company or small business. Just 7% of Americans who work in the government, education or nonprofit sectors expect that robots and computers will definitely take over most human employment in the next 50 years, while 13% of those who work for a large corporation or small business or medium-sized company are certain that this will occur.

Despite their expectations that technology will encroach on human employment in general, most workers think that their own jobs or professions will still exist in 50 years

Yet even as most Americans expect significant levels of workforce and job automation to occur over the next 50 years, most of today's workers¹ express confidence that *their own* jobs or occupations will not be impacted to a substantial degree. Fully 36% of workers anticipate that their current jobs or occupations will “definitely” exist in their current forms five decades from now, while an additional 44% expect that their jobs will “probably” exist in 50 years. Roughly one-in-five workers expect that their current jobs will “probably not” (12%) or “definitely not” (6%) exist in their current forms that far in the future.

Overall there are relatively few differences in these expectations based on workers' demographic characteristics, and the differences that do exist are relatively modest. For instance, younger workers are a bit more likely than older workers to expect that their current jobs will exist 50 years in the future: 84% of workers ages 18 to 29 expect that this will be the case, compared with 76% of workers ages 50 and older.

And as was the case for their predictions for workforce automation in general, workers in government, education and nonprofit sectors are a bit more confident than those in the private sector that their jobs will exist in their current forms 50 years from now: 86% of these workers expect that this will be the case (including 42% who indicate that their current jobs will “definitely” exist), compared with 79% of those who work for a large corporation, medium-sized company or small business.

¹ Throughout this report, the phrase “workers” refers to anyone who reported they were currently employed on a full- or part-time basis at the time of this survey.

Along with these differences based on place of employment, workers' views on this subject also differ somewhat based on the type of work they currently do. For instance, 41% of workers whose jobs involve mostly manual or physical labor expect that their current jobs will "definitely" exist in their current forms in 50 years, as do 34% of those who describe their current occupations as "professional." By contrast, just 23% of those who currently work in a managerial or executive role expect that their current jobs will exist unchanged for the next five decades. But overall, a substantial majority of workers across a range of categories express confidence in the long-term staying power of their current jobs or professions.

One-in-ten workers are concerned about losing their current jobs due to workforce automation, but competition from lower-paid human workers and broader industry trends pose a more immediate worry

Many Americans expect workforce automation to become much more prominent over the coming half-century, but relatively few of today's workers see computers and robots as an imminent threat to their job prospects at the moment.

When asked about a number of issues that might cause them to lose their current jobs, just 11% of workers are at least somewhat concerned that they might lose their jobs because their employer replaces human workers with machines or computer programs. On the other hand, roughly one-in-five express concern that they might lose their jobs because their employer finds other (human) workers to perform their jobs for less money or because their overall industry workforce is shrinking. The most prominent concern is poor management by their own employer, albeit by a narrow margin, among the five evaluated in this survey:

- 26% of workers are concerned that they might lose their current jobs because the company they work for is poorly managed.

Workers in the government, education and nonprofit sectors, as well as those whose jobs involve manual or physical labor, have high expectations for the staying power of their current jobs

% within each group who think their current jobs will definitely/probably exist in 50 years

	Definitely exist	Probably exist	NET
All full- or part-time workers	36%	44%	80%
Place of work			
Large corporation	32	46	79
Small/medium business	36	43	79
Govt/Education/Nonprofit	42	44	86
Type of work			
Mostly involves manual labor	41	41	82
Professional	34	48	82
Manager or executive	23	50	73
Admin, clerical, customer service	29	45	74

Source: Survey conducted June 10-July 12, 2015.

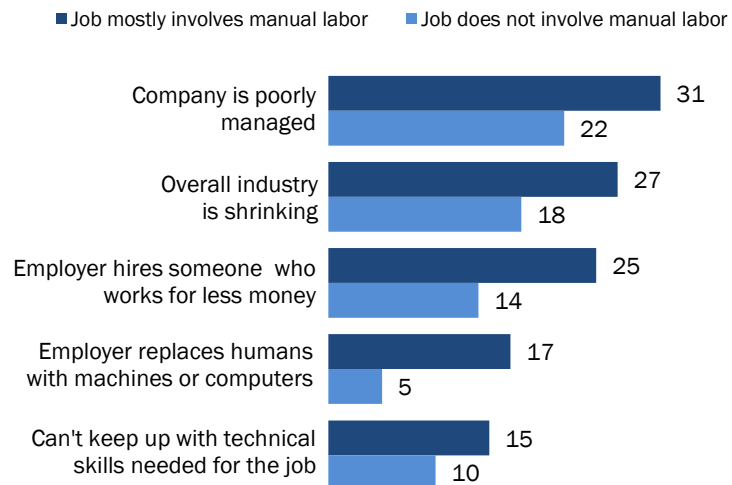
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- 22% are concerned about losing their jobs because their overall industry is shrinking.
- 20% are concerned that their employer might find someone who is willing to do their jobs for less money.
- 13% are concerned that they won't be able to keep up with the technical skills needed to stay competitive in their jobs.
- 11% are concerned that their employer might use machines or computer programs to replace human workers.

Workers whose jobs involve primarily manual or physical labor² express heightened concern about all of these potential employment threats, especially when it comes to replacement by robots or other machines. Fully 17% of these workers are at least somewhat concerned about the threat from workforce automation, with 11% indicating that they are “very concerned.” By contrast, just 5% of workers whose jobs *do not* involve manual labor express some level of concern about the threat of workforce automation.

Workers who perform physical or manual labor more concerned about a number of imminent jobs threats

% of workers in each group who are very/somewhat concerned about losing their current jobs because ...



Note: Based on those who are currently employed on a full- or part-time basis

Source: Survey conducted June 10-July 12, 2015.

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² These workers include those who answered “yes” to the following question: “Would you say that the type of work you do primarily involves manual and physical labor, or not?”

Methodology

The analysis in this report is based on a Pew Research Center survey conducted June 10, 2015, through July 12, 2015, among a national sample of 2,001 adults, 18 years of age or older, living in all 50 U.S. states and the District of Columbia. Fully 701 respondents were interviewed on a landline telephone, and 1,300 were interviewed on a cellphone, including 749 who had no landline telephone. The survey was conducted by interviewers at Princeton Data Source under the direction of Princeton Survey Research Associates International. A combination of landline and cellphone random-digit dial samples were used; both samples were provided by Survey Sampling International. Interviews were conducted in English and Spanish. Respondents in the landline sample were selected by randomly asking for the youngest adult male or female who was at home. Interviews in the cellphone sample were conducted with the person who answered the phone, if that person was 18 years of age or older. For detailed information about our survey methodology, visit: <http://www.pewresearch.org/methodology/u-s-survey-research/>

The combined landline and cellphone samples are weighted using an iterative technique that matches gender, age, education, race, Hispanic origin and nativity, and region to parameters from the 2013 Census Bureau's American Community Survey and population density to parameters from the Decennial Census. The sample also is weighted to match current patterns of telephone status (landline only, cellphone only or both landline and cellphone), based on extrapolations from the 2014 National Health Interview Survey. The weighting procedure also accounts for the fact that respondents with both landline and cellphones have a greater probability of being included in the combined sample and adjusts for household size among respondents with a landline phone. The margins of error reported and statistical tests of significance are adjusted to account for the survey's design effect, a measure of how much efficiency is lost from the weighting procedures.

The following table shows the unweighted sample sizes and the error attributable to sampling that would be expected at the 95% level of confidence for different groups in the survey:

Group	Unweighted sample size	Plus or minus...
Total Sample	2,001	2.5 percentage points
Employed full- or part-time	1,100	3.4 percentage points
Job involves physical or manual labor	446	5.3 percentage points
Job does not involve manual labor	652	4.4 percentage points

Sample sizes and sampling errors for other subgroups are available upon request.

In addition to sampling error, one should bear in mind that question wording and practical difficulties in conducting surveys can introduce error or bias into the findings of opinion polls.

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Topline Questionnaire

EMPLNW Are you now employed full-time, part-time, retired, or are you not employed for pay?

	<u>CURRENT</u>	
%	45	Employed full-time
	13	Employed part-time
	23	Retired
	15	Not employed for pay
	1	(VOL.) Have own business/self-employed
	3	(VOL.) Disabled
	*	(VOL.) Student
	1	(VOL.) Other
	*	(VOL.) Don't know
	*	(VOL.) Refused

EMPTYPE1 How would you describe the place where you work? [READ]

Based on those who are employed [N=1,100]

	<u>CURRENT</u>	
%	32	A large corporation
	16	A medium-size company
	25	A small business
	7	A part of the federal, state or local government
	8	A school or educational institution, OR
	7	A nonprofit organization?
	2	(VOL.) Other
	2	(VOL.) Self-employed/work at home
	1	(VOL.) Don't know
	0	(VOL.) Refused

EMPTYPE2 Would you say that the type of work you do primarily involves manual and physical labor, or not?

Based on those who are employed [N=1,100]

	<u>CURRENT</u>	
%	48	Yes, involves manual and physical labor
	52	No, does not
	*	(VOL.) Don't know
	0	(VOL.) Refused

EMPTYE3 Which of the following best describes the type of work that you do? [READ]

Based on those whose job does not primarily involve manual or physical labor/DK [N=654]

CURRENT		
%	49	Professional
	17	Manager or executive
	2	Government official
	11	Administrative or clerical, OR
	17	Customer service?
	3	(VOL.) Other (SPECIFY)
	1	(VOL.) Don't know
	0	(VOL.) Refused

AUTO1 Next, I'm going to read some reasons why people might worry about losing a job. For each one, please tell me how concerned, if at all, you are about potentially losing your job for this reason. (First/Next), how concerned are you about losing your job because [INSERT ITEMS; RANDOMIZE]? [READ FOR FIRST ITEM THEN AS NECESSARY: Are you very concerned, somewhat concerned, not too concerned or not concerned at all about losing your job for this reason?]

Based on those who are employed [N=1,100]

	VERY CONCERNED	SOME-WHAT CONCERNED	NOT TOO CONCERNED	NOT CONCERNED AT ALL	(VOL.) DK	(VOL.) REF
a. Your employer finds someone who is willing to do your job for less money	8	11	16	63	*	*
b. You aren't able to keep up with the technical skills required to do your job	6	7	16	71	*	*
c. Your employer uses machines or computer programs to replace human workers	6	4	14	75	*	*
d. Your overall industry is shrinking	9	14	16	61	1	*
e. The company that you work for is poorly managed	11	16	16	57	*	*

AUTO2 Thinking about the job or occupation that you work in now, how likely do you think it is that job will exist in its current form in 50 years? Do you think it will definitely exist, probably exist, probably NOT exist, or definitely will NOT exist?

Based on those who are employed [N=1,100]

	<u>CURRENT</u>	
%	36	Definitely will exist
	44	Probably will exist
	12	Probably will NOT exist
	6	Definitely will NOT exist
	2	(VOL.) Don't know
	*	(VOL.) Refused

AUTO3 Overall, how likely do you think it is that in the next 50 years, robots and computers will do much of the work currently done by humans? Do you think this will definitely happen, will probably happen, will probably NOT happen, or will definitely NOT happen?

	<u>CURRENT</u>	
%	15	Definitely happen
	50	Probably happen
	25	Probably NOT happen
	7	Definitely NOT happen
	3	(VOL.) Don't know
	*	(VOL.) Refused