The Automation Divide

By Ipsos Public Affairs and the Center for Business Analytics in the McIntire School of Commerce at the University of Virginia

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The Automation Divide

Change is a constant, and automation represents one of the most sweeping changes happening right now. Automation has touched most industries and doesn't show signs of abating. But what exactly is automation? Experts define automation as "technology that actively selects data, transforms information, makes decisions, or controls processes" (Lee & See, 2004, p. 50).[1] Automation can perform complex, repetitive tasks quickly and often more accurately and reliably than humans. It includes everything from online shopping and self-checkouts to drones and self-driving cars.

As automation is taking over tasks that used to be performed by people, it is freeing them up to do other things. But how are consumers and employees viewing these changes and what do they think about automation? Ipsos and the Center for Business Analytics at the University of Virginia's McIntire School of Commerce recently conducted a research program to explore attitudes around automation, including two online surveys of U.S. adults.[1,2] For the full results of the surveys, go to http://bit.ly/2gD4EX2

Clifford Young, President, Ipsos U.S. Public Affairs at the 2017 Analytics Colloquium at the McIntire School of Commerce

[1] Lee, J. D., & See, K. A. (2004). Trust in automation: Designing for appropriate reliance. Human Factors, 46, 50–80.
[2] 1,008 U.S. adults aged 18–64; surveyed May 24 – 25, 2017

Big Picture Views

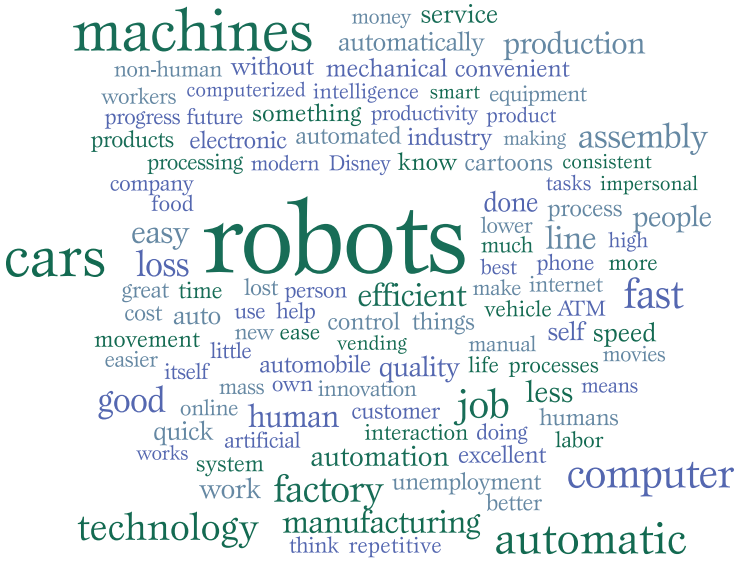
The first thing that most people associate with automation is "robots," followed by machines, cars, computers, technology, and speed.[2] As a general concept, Americans tend to feel favorably towards automation.[1] When it comes to specific applications, they particularly like online shopping and banking, self-checkouts, and wearable electronics. However, they feel less favorably towards certain uses of automation like self-driving cars, automated voice phone menus, and drones.

Not surprisingly, usage breeds familiarity and favorability. The more consumers use automated technology, the more familiar they are with it. The more familiar they are with it, the more they like it. The most common automation applications used by U.S. consumers facilitate commercial transactions and communications: online shopping and banking (currently used by 87% of adults), self-check-out/ordering kiosks (73%), automated voice menus (63%), customer service online chat boxes (58%), and voice recognition assistance (50%). Consumers also like these applications the most, with the exception of automated voice phone menus which they find irritating. The technology they like the least is the technology with which they are least familiar, including self-driving cars and drones.[3] These applications are not yet widely used and tend to make consumers feel "hesitant" or "worried."

People view increased ease, comfort, speed, and time savings as the biggest benefits of automation. The biggest drawbacks include increased laziness, loss of jobs, reduced human interaction, malfunctions, and usage difficulties. Beyond these big-picture trends, the research shows great variation in usage, familiarity, and feelings towards automation across demographic groups.

Consumers: Autophiles vs. Autophobes

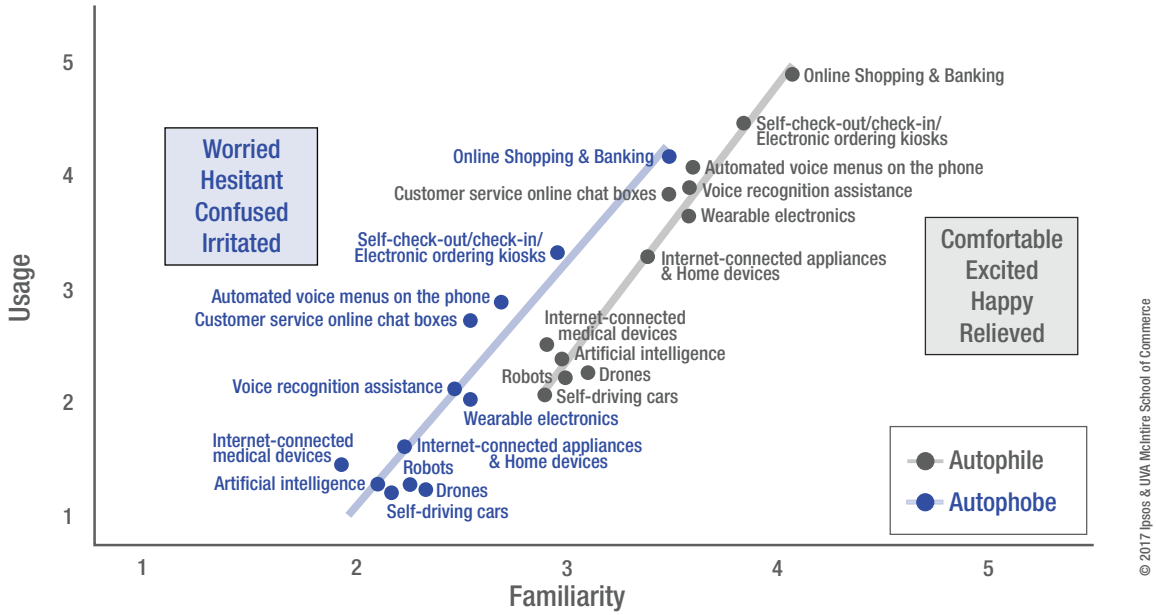
A deep dive in the data reveals that consumers generally fall into one of two groups when it comes to automation. We refer to them as "autophiles" and "autophobes."[3] Autophiles are those who support automation and generally feel positively about it. They skew male, younger, more affluent, and more educated. Autophobes are those who resist automation and generally feel negatively about it. They lean female, older, less affluent, and less educated. Autophiles tend to be more avid users of a variety of automated technology than autophobes.



[1] Lee, J. D., & See, K. A. (2004). Trust in automation: Designing for appropriate reliance. Human Factors, 46, 50–80.
[2] 1,008 U.S. adults aged 18–64; surveyed May 24 – 25, 2017
[3] 2,982 U.S. adults aged 18+; surveyed June 29 – July 3, 2017

Automation: Consumer Perspective

Familiarity and Usage: The Automation Divide?



Autophiles are not only more familiar with automation, they also tend to view it more positively. They believe automation has resulted in desirable outcomes, such as making life easier and more interesting, improving the accessibility and quality of products and services, producing more accurate health diagnoses, and improving the shopping experience. On the other hand, autophobes believe that automation does more harm than good. They believe it destroys more jobs than it creates, isolates people more than brings them together, and they worry about their safety when using automated devices.

What is most notable about autophiles and autophobes is the extent of the divide between the two groups. Autophiles use wearables, chat bots, and voice recognition more than autophobes use any automated technology, with the exceptions of online shopping and banking. Among autophobes, online shopping and banking is much more prevalent than usage of any other type of automated technology. It is possible that for many of them e-shopping and e-banking is more a necessity than a choice, especially if they live in more rural areas, where access to stores and bank branches is limited. This notion is consistent with prior research on technology adoption in "out of necessity" contexts, which notes that users' perceptions of usefulness, ease of use, and likelihood of adopting technology are significantly different in situations where status quo alternatives are less viable.[4]

These findings align with those of the recent Ipsos Canada Next[5] study which showed that consumers can be easily categorized as either supportive of technology or resistant to it. Supporters of technology believe the benefits outweigh the costs. Those who are resistant to technology believe it will result in more negative outcomes, such as a loss of privacy.

One thing that autophobes and autophiles have in common: Both worry about data security when using automated devices. In fact, data security was viewed as the biggest drawback of automation, with 70% of respondents considering it to be a concern.[3]

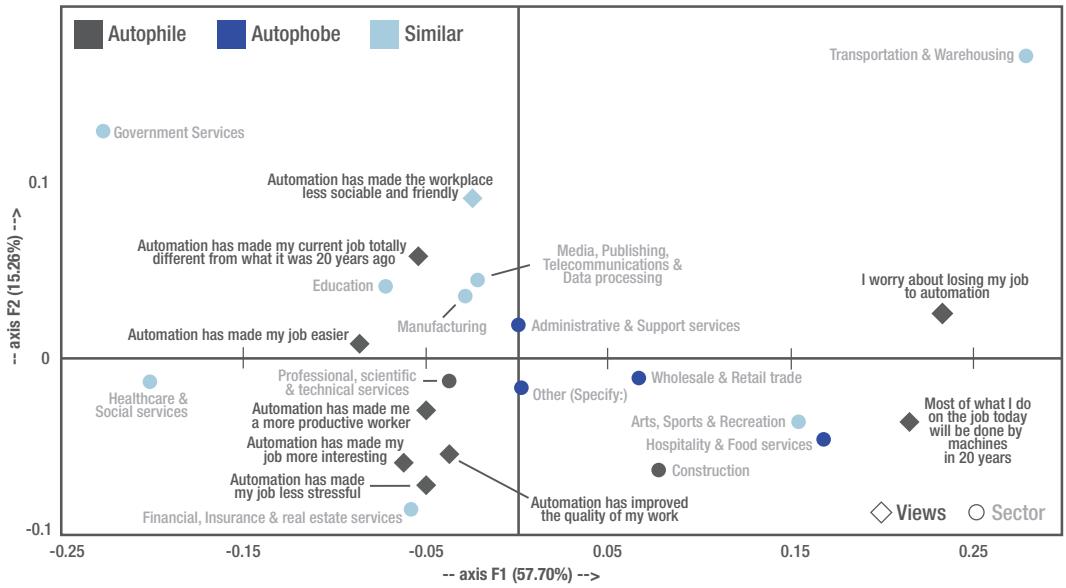
[3] 2,982 U.S. adults aged 18+; surveyed June 29 – July 3, 2017
[4] Brown, S. A., Massey, A. P., Montoya-Weiss, M. M., & Burkman, J. R. (2002). Do I really have to? User acceptance of mandated technology. European journal of information systems, 11(4), 283–295.
[5] https://www.ipsos.com/sites/default/files/ct/publication/documents/2017-09/IpsosCanadaNext-2017-9-18v4.pdf

Workplace Perspective: Experience, Expectations and Exposure to Automation

The automation divide breaks out slightly differently when it comes to the workplace. Autophobes and autophiles tend to agree on the drawbacks and benefits of workplace automation.[6] Both groups view job loss as the most common drawback and productivity as the most common benefit. However, differences emerge along the lines of decision-making authority. For those who aren't decision-makers in their jobs, the risk-reward of automation becomes amplified. Non-decision makers are 35% more likely than decision-makers to cite job loss as the biggest cost. On the other hand, non-decision-makers are also 33% more likely to view productivity as the biggest benefit.[7] Overall, decision-makers are much more likely to agree that automation has had a beneficial impact on their job.

Automation Divide: Workplace Perspective

Views about Automation in the Workplace by Sector



Q. To what extent do you agree or disagree with each of the following? Base (total): ca. 1,676 employed U.S. adults aged 18+ interviewed online June 29 - July 3, 2017

Experience, expectations, and exposure to automation also vary by industry. When looking at how these three variables intersect, employees of various sectors cluster in three main groups: 1) the "Unprepared," 2) the "Survivors," and 3) the "Unaffected."

[6] 1,676 employed U.S. adults aged 18+; surveyed June 29 – July 3, 2017

[7] 40% of decision makers and 54% of non-decision makers considered job loss the biggest cost, while 15% of decision makers and 20% of non-decision makers considered productivity the biggest benefit.

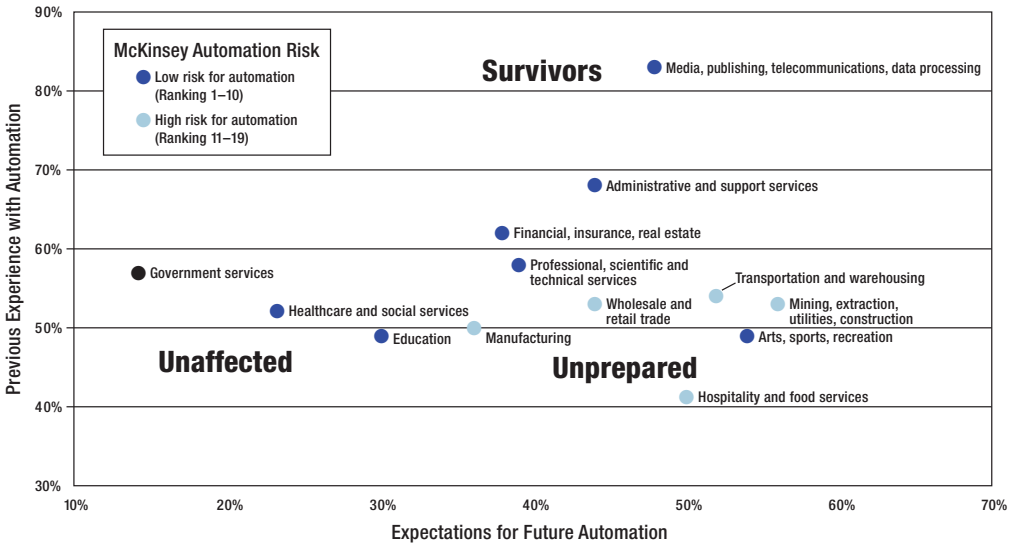
Industries where workers are most likely to be "Unprepared" are those that have not yet experienced as much job disruption due to automation as some other sectors, but are nevertheless expected to be transformed the most by automation in the future, according to a McKinsey report.[6] Relative to the magnitude of change that experts are predicting, employees from these sectors tend to have a fairly low level of expectation that the task they are doing today will be fully automated. These industries include manufacturing, wholesale/retail trade, transportation/warehousing, hospitality/food services, and mining/extraction/utilities/construction. For instance, only 36% of those in manufacturing believe that their job will be done by machines in 20 years, and yet this industry is ranked #2 at risk for getting automated.[6] In addition, manufacturing workers are relatively unconcerned about losing their job to automation compared to workers across all sectors.

Industries where employees can most often be labeled as "Survivors" are those that have already been disrupted by automation and are not expected by experts to undergo changes as radical as other sectors in the foreseeable future.[8] These industries include: media/publishing/telecom/data processing, administrative/support services, financial services, and professional/scientific/technical services. Possibly because they have been able to adapt to change, workers in these industries tend to report positive outcomes of automation. For instance, they are particularly likely to say that it has made their job easier and more productive.

The "Unaffected" are most found in sectors where employees are less likely than U.S. workers in general (a) to have already experienced job disruption due to automation, (b) to anticipate that their job will become automated in the future, and (c) to actually see all the tasks they do now be fully automated, according to the McKinsey study.[6] These industries include healthcare/social services and education. Government services would also fall into this group, although this sector wasn't profiled in the McKinsey report. Not surprisingly, the "Unaffected" tend to be among those least worried about losing their jobs to automation.

The one outlier is the arts/sports/recreation industry. Employees in this industry are more concerned about the impact of automation than those in almost every other sector, and yet their industry is considered far less "automatable" than most, ranking #12 on McKinsey's list.

Automation Experience and Expectations by Risk Level



McKinsey Quarterly, July 2016, Where machines could replace humans — and where they can't (yet)

[6] 1,676 employed U.S. adults aged 18+; surveyed June 29 – July 3, 2017
[8] McKinsey Quarterly, July 2016, Where machines could replace humans – and where they can't (yet).

In Summary

One thing is clear: Americans are divided in their perceptions and expectations about automation. On one side are those who are well-prepared and optimistic about a future with increased automation. They feel comfortable with a wide range of automated technology and use it often. In the workplace, those who have already experienced a great deal of disruption from automation have found that it makes their job easier. On the other side of the divide are those who fear automation and resist the changes it brings. The technology feels unfamiliar and dangerous to them. In industries such as manufacturing, employees are unprepared for the disruption that automation is expected to cause. While automation is inevitable, consumers and employees on both sides of the divide are responding to it in dramatically different ways.

Recommendations

Given the potential socio-economic implications of the automation divide, we conclude with key recommendations for various stakeholder groups interested in bridging the divide in consumer and/or workplace settings:

- *Consumer Perspective: In Automation We Trust*—Research on automation has shown that trust is critical to continued usage and reliance on automation. In order to enhance trust amongst autophobes, firms should better communicate the value proposition of automation with respect to the 3Ps: purpose, performance, and process.[9]
- *Consumer Perspective: Secure Automation*—Data security was identified as the biggest concern related to automation. In this era of profound digital transformation, data breaches and exploitation of security vulnerabilities abound. Thus, protecting enterprise and cyber-physical systems that support automation is of paramount importance.
- *Workplace Perspective: Preparing the Unprepared*—The majority of employed respondents believe automation destroys more jobs than it creates. The implications of these concerns are perhaps most dire in industries such as hospitality, manufacturing, mining, etc. where employees are least prepared. Firms and policymakers must come together to ensure suitable training and retooling programs are available for displaced and at-risk workers.[10]
- *Workplace Perspective: Aligning Risk-Reward Perceptions*—Workers in non-decision-making roles view the risks and rewards of increased automation differently than those tasked with ultimately making such decisions. Organizations interested in gaining the most benefit from automation should consider lessening this dichotomy through change management initiatives that foster greater dialogue and understanding.[11]

This study represents a first step towards understanding consumerization and the future of work in the era of automation. Helping consumers and employees adjust to an ever-changing technology-driven world will be a vital next step.

*Note. Government services did not have a McKinsey rating.

[9] Lee, J. D., & See, K. A. (2004). Trust in automation: Designing for appropriate reliance. Human factors, 46(1), 50–80.
[10] Mishel and Bivens, 2017 EPI Report. http://www.epi.org/publication/the-zombie-robot-argument-lurches-on-there-is-no-evidence-that-automation-leads-to-joblessness-or-inequality/
[11] Boxall, P. (2013). Mutuality in the management of human resources: assessing the quality of alignment in employment relationships. Human Resource Management Journal, 23(1), 3–17

Contact

Ipsos

Clifford A. Young
President, Ipsos Public Affairs US
clifford.young@ipsos.com

Nicolas Boyon
Senior Vice President, Ipsos Public Affairs US
nicolas.boyon@ipsos.com

Katie Ziemer
Associate Research Scientist, Ipsos Public Affairs US
katie.ziemer@ipsos.com

University of Virginia McIntire School of Commerce

Richard G. Netemeyer
Ralph A. Beeton Professor of Free Enterprise;
Area Coordinator—Marketing
rgn3p@virginia.edu

Ahmed Abbasi
Associate Professor of Commerce; Director, Center for Business Analytics; Murray Research Professor
abbasi@comm.virginia.edu

David G. Dobolyi
General Faculty; Research Scientist,
Center for Business Analytics
dd2es@comm.virginia.edu

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