



REPORT

State of AI Bias

 DataRobot



Introduction

As concerns around biased AI grow, 81% of respondents want government regulation for defining and preventing AI bias.

AI has become a table stakes business tool – the adoption of which is growing by the day. This rise in adoption has only been compounded as organizations continue to call on AI to help mitigate the business and data-related challenges created by the COVID-19 pandemic. In fact, Forrester¹ estimates that nearly 100% of organizations will use AI by 2025.

AI has the potential to deliver tremendous value to businesses and the overall economy but is proving to be problematic when it comes to accurately representing entire populations. Concern around AI bias has risen nearly as quickly as AI adoption itself – and for good reason. Companies that have experienced bias in their algorithms have lost revenue, customers, and employees as a result. While what it means to be fair in decision-making is an incredibly complex question, DataRobot believes it is critically important that AI is trusted and explainable – in fact, we work with businesses every day to ensure their AI models are fair and unbiased.



To understand how organizations are identifying and mitigating instances of AI bias, DataRobot surveyed more than 350 U.S. and U.K.-based technology leaders, including CIOs, IT directors, IT managers, data scientists, and development leads, who use or plan to use AI. This survey – fielded in 2021 – follows a report published by DataRobot in November 2019 to gauge how AI bias perceptions, issues, and prevention/management tactics have evolved. The results indicate that not only are concerns around AI growing, but bias is evidently present and inadvertently contributing to negative business outcomes.

"DataRobot's research shows what many in the artificial intelligence field have long-known to be true: the line of what is and is not ethical when it comes to AI solutions has been too blurry for too long. The CIOs, IT directors and managers, data scientists, and development leads polled in this research clearly understand and appreciate the gravity and impact at play when it comes to AI and ethics. Over half of IT leaders claim they are very or extremely concerned about AI bias, while an overwhelming majority (81%) are calling for more AI regulation. What we're seeing with the proposed EU regulations is a step in the right direction — but we have a long way to go as businesses seek guidance on how to use AI ethically. What the leaders surveyed realize is that when we regulate AI to reduce bias we don't hinder innovation and industry growth — we fuel it."

- Kay Firth-Butterfield,
Head of AI and Machine Learning,
World Economic Forum



Half of IT leaders
are very or extremely
concerned about
AI bias.

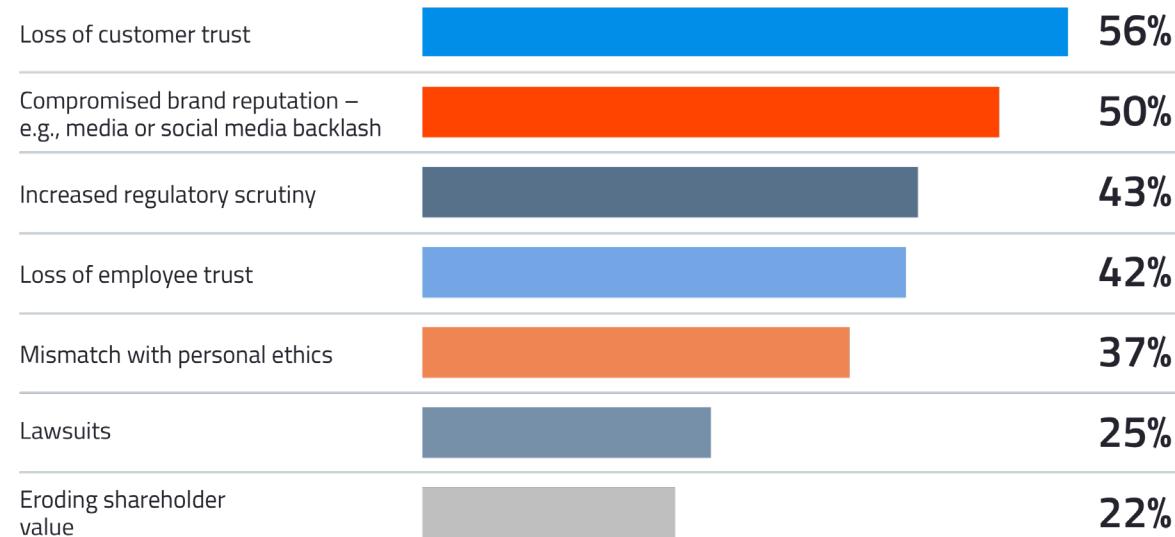
UK respondents are more
worried about loss of customer
trust as a result of AI bias –
with **64%** expressing this
concern compared to **54%**
of U.S. respondents.

Concern About AI Bias is Growing

Concern around AI bias has grown; over half (54%) of technology leaders say they are very or extremely concerned about AI bias, compared to the 42 percent who shared this sentiment in 2019.

The repercussion from AI bias that concerns technology leaders most is loss of customer trust (56%). This is followed by compromised brand reputation (50%), increased regulatory scrutiny (43%), and loss of employee trust (42%).

CONCERNS AROUND AI BIAS:



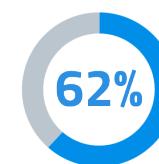


More than 1 in 3 organizations have suffered due to an occurrence of AI bias in one or several algorithms.

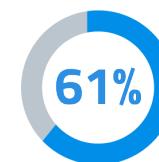
AI Bias Concerns are Warranted: It's Negatively Impacting Business

The impacts of AI bias are far from hypothetical. 36% of survey respondents say their organizations have suffered due to an occurrence of AI bias in one or several of their algorithms. Of those organizations, 62% lost revenue and 61% lost customers.

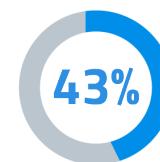
NEGATIVE IMPACTS OF AI BIAS:



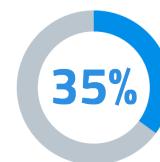
Lost revenue



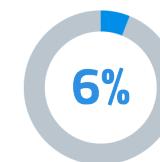
Lost customers



Lost employees
as a result of AI bias



Incurred legal fees
due to a lawsuit
or legal action



Loss of customer
trust

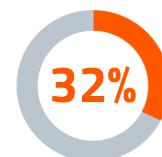


More than one-third of respondents say their organization's algorithms have inadvertently contributed to gender discrimination.



These ramifications are due in part to the discrimination that biased algorithms have contributed to. Respondents report that their organizations' algorithms have inadvertently contributed to gender discrimination (32%), age discrimination (32%), racial discrimination (29%), sexual orientation discrimination (19%), and religious discrimination (18%). The issue of gender discrimination is occurring more in the U.S. than in the U.K., where 24% of respondents see it as a problem in their organization's algorithms.

DISCRIMINATION FROM AI BIAS:



Lost revenue



Lost customers



Lost employees
as a result of AI bias



Incurred legal fees
due to a lawsuit
or legal action



Loss of customer
trust

These biases exist despite organizations putting guardrails in place. Seventy seven percent of organizations say they had an AI bias or algorithm test in place prior to bias discovery. U.S. organizations in particular may need to reevaluate the tests they implemented – given that more organizations in the U.S. (80%) had AI bias monitoring or algorithm tests in place prior to bias discovery than organizations in the U.K. (63%).

The Challenges to Preventing AI Bias – and What IT Leaders Think Will Help

"One of the most intriguing insights of the 2021 DataRobot AI Bias Study is that four out of five executives (81%) wish that government regulation would define and help prevent AI bias. Indeed, government regulation lags today's industry practice that has seen the invention and use of various products and services based on AI. AI provides countless opportunities for businesses and offers means to battle some of the most pressing issues of our time (think of climate change). At the same time, AI poses risks and legal issues including opaque decision-making (the black-box effect), discrimination (based on biased data or algorithms), privacy, and liability issues. This is where the European Commission's proposal for harmonized rules on AI regulation comes into play."

— Prof. Dr. Emanuel de Bellis,
Institute of Behavioral Science and Technology,
University of St. Gallen



Two-thirds of respondents say
AI bias “guardrails” that automatically detect bias in datasets are an important feature when choosing an AI platform.

Despite being a top focus and investment area for organizations, there are still hurdles to identifying and preventing instances of AI bias. The #1 challenge that respondents have encountered when trying to eliminate bias is understanding the reasons for a specific AI decision.

THE TOP CHALLENGES TO ELIMINATE BIAS:

Understanding the reasons for a specific AI decision

1

Understanding the patterns between input values and AI decisions

2

Developing trustworthy algorithms

3

Determining what data is used to train AI

4

Fueling AI systems with up-to-date and comprehensive data

5

Educating stakeholders to identify AI bias

6

Uncertainty as to what constitutes “AI bias”

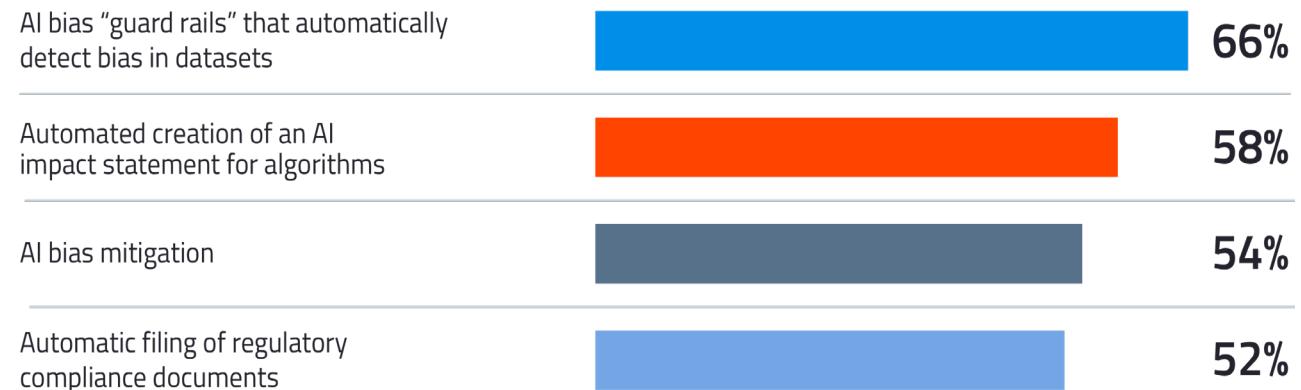
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97% of respondents agree that, "platforms with standardized workflow and automated bias detection features can reduce instances of human bias and error."

To overcome these challenges, IT professionals are interested in key AI platform features to better detect bias. Two-thirds (66%) of respondents say AI bias "guardrails" that automatically detect bias in datasets are an important feature when choosing an AI platform.

TOP AI FEATURES TO DETECT BIAS:



Nearly every respondent (97%) either strongly or somewhat agrees that "platforms with standardized workflow and automated bias detection features can reduce instances of human bias and error." Seventy-seven percent of respondents also report that platforms with standardized workflow and automated bias detection could reduce instances of human bias and error significantly or very much.



81% of IT professionals
think government
regulation would be
helpful in defining and
preventing AI bias.

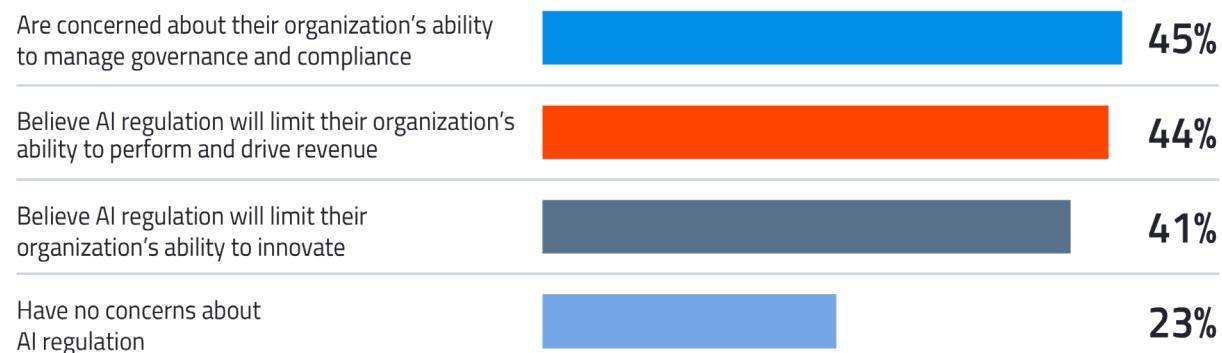
45% of IT pros worry
increased AI regulations
will grow costs and make
adopting AI difficult.

- VS -

32% of respondents
worry no AI regulation will
hurt protected classes

Respondents believe government regulations – like the EU's newly proposed AI principles – could also help organizations mitigate AI bias. In fact, 81% of respondents think government regulation would be helpful in defining and preventing AI bias. That said, respondents are torn over whether AI regulation could be more harmful than helpful. Forty-five percent of respondents are worried that increased AI regulation will grow their company's costs and make AI adoption more difficult. At the same time, 32% of respondents are worried that a lack of government regulation around AI will have harmful effects on protected classes of people. This split perception underscores that operating frameworks – within organizations and globally – are still far from optimized.

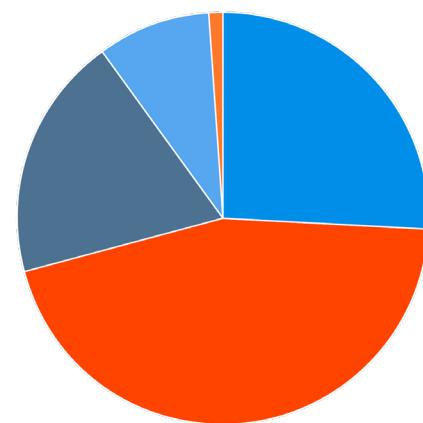
CONCERN OVER AI REGULATION:





How Organizations Are Attempting to Mitigate AI Bias

While concern about AI bias is increasing, organizations' confidence in bias prevention is up, thanks to steps they are taking or planning to take. Seventy-one percent of respondents are extremely or very confident in their company's ability to identify AI bias, a 7% increase versus 2019. Interestingly, respondents in the U.S. are more confident in their ability to identify AI bias than those in the U.K. – with 75% of U.S. respondents saying they are extremely or very confident, compared to 56% in the U.K.



CONFIDENCE IN AI BIAS IDENTIFICATION:

- **26%** Extremely confident
- **45%** Very confident
- **19%** Moderately confident
- **9%** Slightly confident
- **1%** Not confident at all

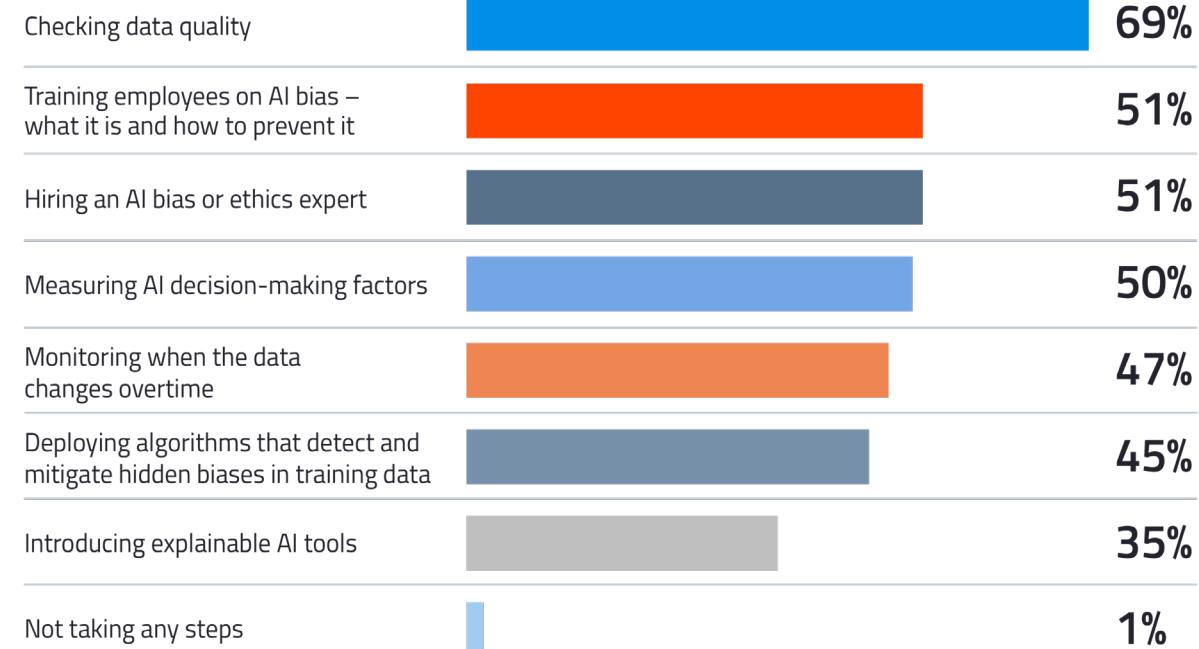


7 in 10 respondents
are confident in their
company's ability
to identify AI bias.

Today

Nearly 7 in 10 (69%) respondents say their organizations do data quality checks to avoid AI bias. About half of respondents' organizations are training employees on AI bias (i.e., what it is and how to prevent it; 51%), hiring an AI bias or ethics expert (51%), and/or measuring AI decision-making factors (50%).

ACTIONS TO AVOID AI BIAS:

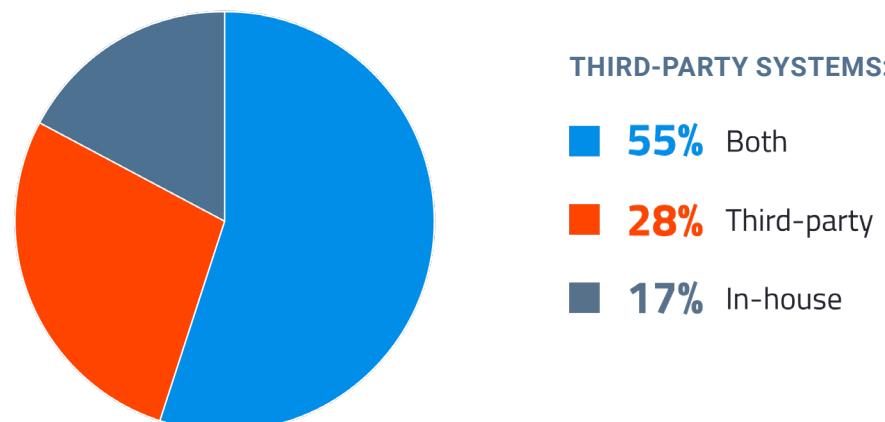




Nearly one-fifth (17%) of respondents have no requirements for vendors to prove their systems are not biased – leaving the door open for suppliers to bring in bias despite internal efforts.

Eighty-seven percent of organizations are specifically taking steps to detect and prevent indirect bias – i.e., bias that occurs when there are attributes that may be proxies for a protected attribute, such as zip code or sporting activities. This effort is stronger in the United States, with 88% of U.S. respondents taking steps to detect/prevent indirect bias, versus 29% of U.K. respondents.

Technology leaders are also evaluating the third-party systems they use. More than half (55%) of total respondents say their organizations use a combination of third-party and in-house AI systems. Of the respondents who use third-party systems, 83% require their supplier to provide evidence that their systems are not biased. That said, nearly one-fifth (17%) of respondents have no such requirements – leaving the door open for suppliers to bring in bias despite internal efforts.



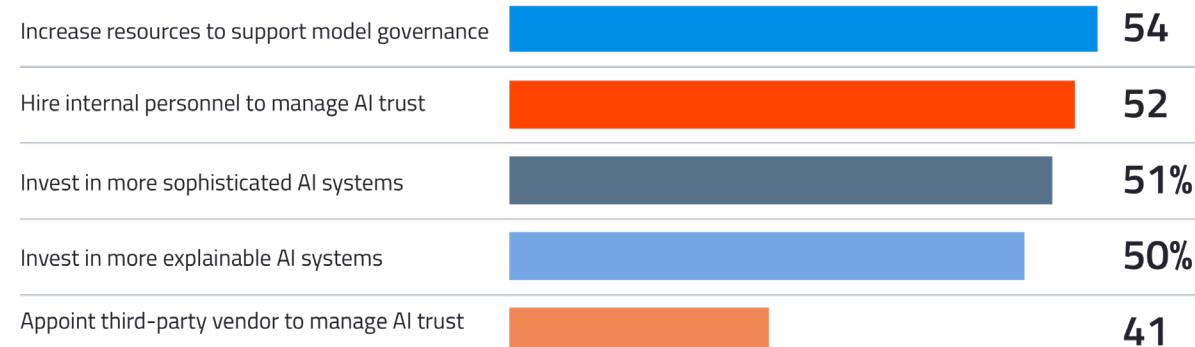


84% of organizations
plan to invest more
in AI bias prevention
in the next 12 months.

Looking Forward

Overall, AI bias prevention is a long-term priority for organizations. Eighty-four percent of respondents say their organizations are planning to invest more in AI bias prevention initiatives in the next 12 months. Specifically, they plan to increase resources to support model governance (54%), hire internal personnel to manage AI trust (52%), and/or add more sophisticated AI systems (51%).

INVESTMENTS IN THE NEXT 12 MONTHS:

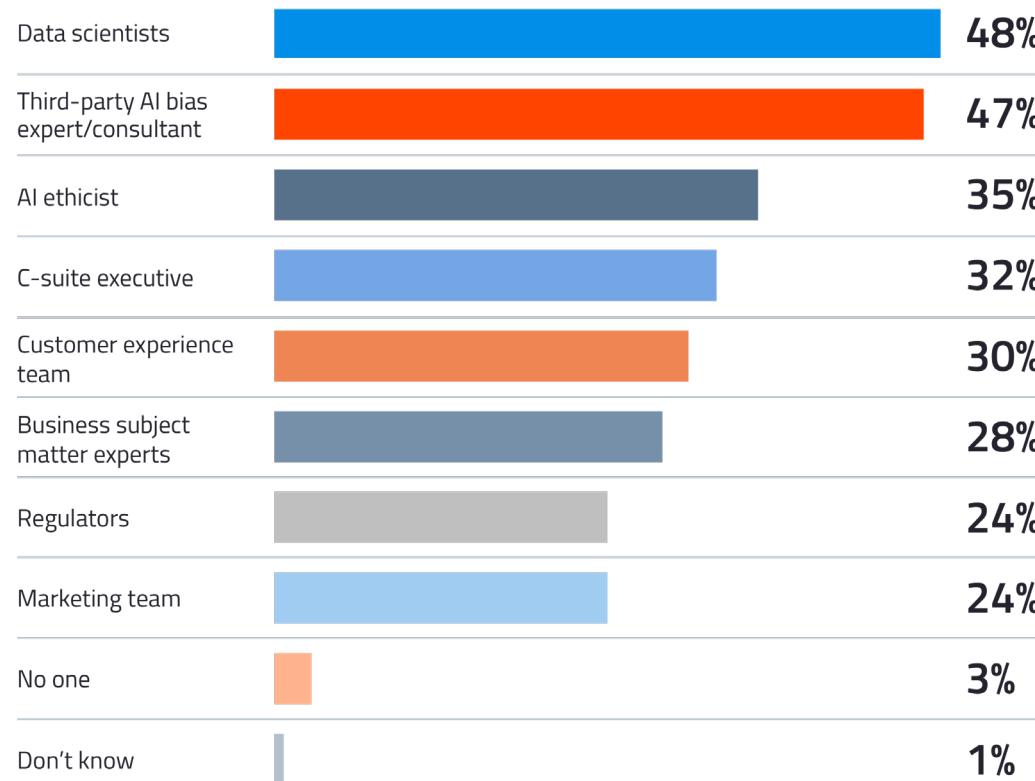




Who is Involved in AI Bias Prevention Initiatives?

As organizations bolster efforts to prevent AI bias, they need to make sure the right people are involved. Today, nearly half (48%) of technology professionals rely on data scientists to define whether bias exists in their organization's algorithms and datasets. Another 47% rely on a third-party AI bias expert/consultant.

PEOPLE INVOLVED IN AI BIAS PREVENTION INITIATIVES:





28% of CIOs in 2021
were involved in AI bias
prevention, a **21% drop**
versus 2019

CIOs seem to be less involved in AI bias prevention initiatives than they were in years past. In 2019, nearly half (49%) of CIOs were involved in AI bias prevention, but this number dropped to 28% in 2021.

In addition to relying on internal experts, respondents say their organizations are looking to third parties to help mitigate bias. In fact, 64% of respondents say they would hire an AI firm to make sure their AI algorithms weren't biased. Another 46% say they would hire a consulting firm, and 20% would hire an accounting firm.

SHIFTING ROLES IN AI BIAS PREVENTION:

	2019	2021
COO	12%	14%
Data Scientists	44%	43%
AI Researchers	51%	43%
CTOs	42%	38%
Third-party AI bias experts/consultants	30%	38%
CEO	29%	25%
COO	12%	14%



Conclusion

The repercussions of AI bias are significant. Companies have a lot to lose – revenue, customers, employees, trust – by neglecting to address it. The onus is on the organization not only to be responsible and ethical when leveraging AI, but also to tap the resources that will ensure the success of such efforts. Leaders must ensure the products they use to identify and prevent bias have guardrails and they must educate employees on what types of data to use and when, as well as create guidelines for the entire company to adhere to. With this holistic approach, biases in AI algorithms can be diminished.

The complexity (and controversy) around AI bias has made one thing clear: humans and AI are deeply intertwined. Human involvement in AI systems remains – and will continue to remain – essential. By leveraging AI experts who know how to optimize both sides of the human-AI coin, organizations can ensure that AI is free from human flaws, and humans are free from AI biases.

2021 METHODOLOGY

In June 2021, DataRobot conducted an online survey of more than 350 U.S. and U.K.-based CIOs, IT directors, IT managers, and development leads who use or plan to use AI.

2019 METHODOLOGY

In June 2019, DataRobot conducted an online survey of more than 350 U.S. and U.K.-based CIOs, CTOs, VPs, and IT managers involved in AI and machine learning purchasing decisions.

¹ Forrester Webinar: The Evolution Of ML Platforms To AI Platforms: A Spectrum Of Capabilities by Mike Gualtieri, April 7, 2021