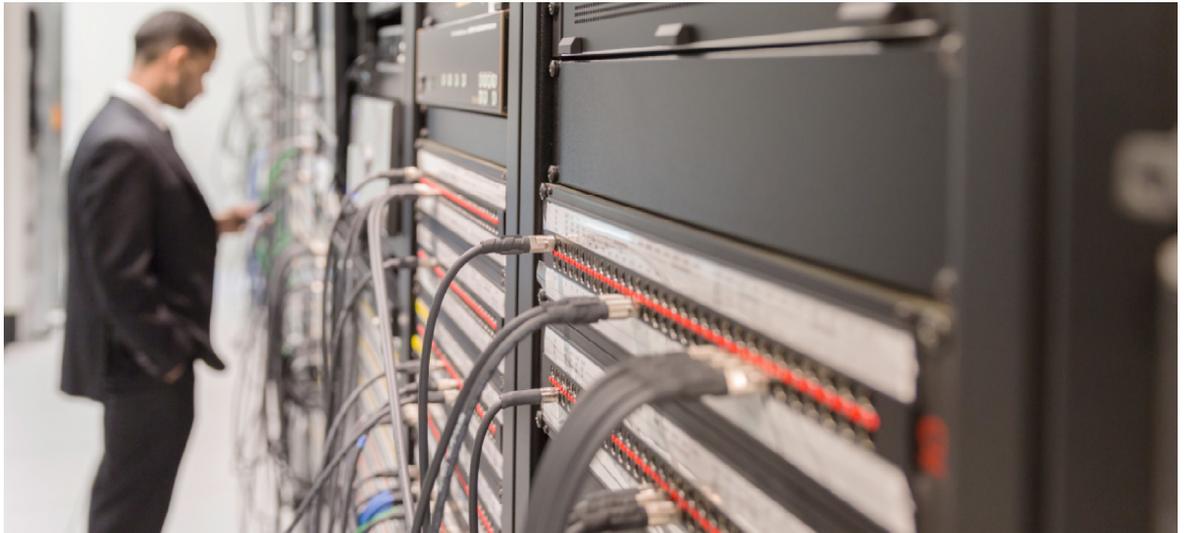


# The human factor: Working with machines to make big decisions

We're at an inflection point where artificial intelligence can help business make better and faster decisions. It requires an open mind – and a willingness to change – to take advantage of it.



Executives who once relied firmly on their intuition and experience are now face-to-face with machines that can learn from massive amounts of data. It's changing people's relationships with technology and it's opening the door to truly data-driven decision-making. It's time to welcome science into the C-suite, yielding analysis to algorithms to find a new mix of mind and machine.

PwC's Data and Analytics Survey 2016: Big Decisions™ shows that most executives say their next big decision will rely mostly on

human judgment, minds more than machines. However, with the emergence of artificial intelligence we see a great opportunity for executives to supplement their human judgement with data-driven insights to fundamentally change the way they make decisions.<sup>1</sup>

"This is an inflection point," says Anand Rao, an innovation lead in PwC's data & analytics practice, speaking of the growing role of machine learning in the business world. "Artificial intelligence can help people

make faster, better, and cheaper decisions. For that to happen, first and foremost, you need an openness of mind to collaborate with the machine, as opposed to treating the technology as either a servant or an overlord."

This balance of mind and machines is just taking hold as companies experiment. Executives say their internal cultures could be more data-driven, with a greater emphasis on data analytics. But making the most of the opportunity is really about organisational cultures, driven by leadership.

<sup>1</sup> For a brief primer on AI, see Anand Rao's blog series: *AI Everywhere & Nowhere*.

## New lens to reality

Under every decision made by humans is a natural and unavoidable bias – and it can obscure an organisation’s path forward. Executives might cherry-pick data that supports their viewpoint; or they might discard data that contradicts their gut feeling. They can’t see what lies within the data. “Technology is a way past bias,” says Dan Ariely, a professor of psychology and business economics at Duke University. “Big data and algorithms are creating another lens to reality.”

How do you deliver analysis that avoids bias? The vast majority of decisions are made by groups of people, all with built-in bias. In our survey, decision-makers chose a decision to describe to us. Twenty-six percent of respondents said they would involve the board in making the decision they described, and 34% said they would involve people in specific organisational roles. On the surface, collaborative decision-making could solve for bias. But does it?

“Sadly, no,” Ariely says. Yes, groups can help diminish bias through the wisdom of crowds. But groups often don’t know the right answer; non-vocal people with the right answer can be drowned out in group discussions. One might hesitate to contradict a boss. The mind plays all sorts of games with itself: Confirmation bias makes you see what you expect; wishful blindness keeps you from seeing what you don’t want to see; people place an emphasis on internal characteristics – meaning human personality – over external situations. But now, with AI, we don’t have to fool ourselves as much. “Algorithms create some kind of discipline in how we are going to approach the world, rather than allowing us to take each situation separately, fully on gut intuition,” Ariely says. “We basically are forced to be more systematic about our decisions.”

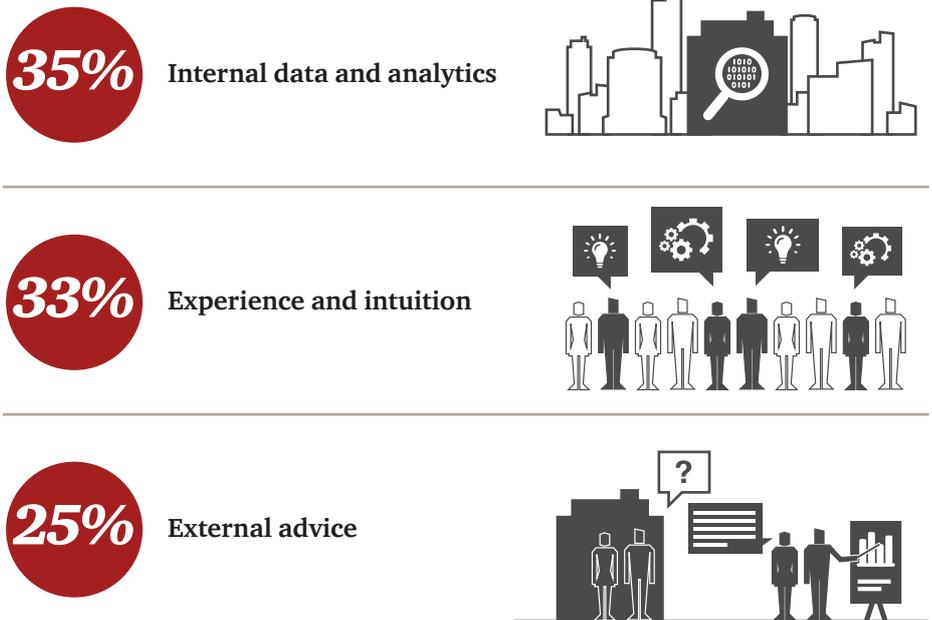
## PwC’s Global Data and Analytics Survey 2016: Big Decisions™

To get a clear understanding of how business leaders approach decision-making in their organisations, PwC used a narrative-led methodology to see experiences that otherwise wouldn’t be captured in standard survey instruments.

As of May 15, 2016, PwC and Forbes Insights have collected micro stories and other signifying data from more than 2,100 C-suite leaders, business unit heads, and SVPs across more than ten major countries and 15 industries. We asked these leaders about decision-making in their organisations: The degree to which they see themselves as data-driven; their reliance on machine learning versus human judgment; their needs around decision-making speed and sophistication; and the limitations they face.

## Do you have an open mind when it comes to using data?

### Executives say their decisions rely mostly on...



Source: PwC’s Global Data and Analytics Survey, July 2016. Q: What will you rely on most when making your next strategic decision? Global base: 2,106 senior executives. N/A not shown.

## Science in the C-suite

Ariely worries that a reliance on machines could become a substitute for experimentation – the human spirit of inquiry. It's a worry that cuts to the core of what modern business decision-making should be about: science, a human-guided process of asking the right questions and charting a path toward specific goals. Far from being excluded from analysis and problem-framing, top executives should drive the exploration; data scientists should design the experiments to prove leadership's hypotheses. Algorithms can execute commands and evolve on their own, becoming autonomous in some cases.

"Science is coming into the business world out of necessity," says Floyd Yager, chief data officer at Allstate, pointing to the tendency of leaders to find data that supports what they want to do instead of asking if a hypothesis is right and taking action based on that result. "Testing your positions creates consistency in decisions," he adds. "It brings in facts you might not have considered in your judgment – that, instead of thinking you know it, you actually know it. You have a basis in fact, a basis in data, to really drive your decisions toward goals and outcomes."

Yager is talking about a profound transformation in the business world. "I give the credit to folks above me here who really see where the world of data is going and understand that there are better ways to do things," he says. "I've been fortunate to be in places where I can push forward some of that work – data and analytics – and bring a vision to life where you think about the possibilities and find the data, the tools, the techniques, to help us make better decisions."

This is leadership. Survey results show that, in looking up to the C-level for the kind of support that Yager describes, many managers see a gap in the adoption of – or trust in – data. Top leaders are used to making decisions based on experience and intuition, and now they'll need to adapt, experiment, and learn along with data scientists.

## Leaders wanted

"To some degree, being data-driven is not about the technology and the data, it's really about change management and adoption – being able to have the conversation that walks leaders through the data and answers any and all challenges to it," says Dan DiFilippo, partner and global and US data & analytics leader at PwC.

Decision-makers acknowledge it's not data or analysis that holds them back the most from making successful decisions. The top three limitations to their success are stronger leadership, budgetary considerations, and availability of resources to take action. Surprisingly, stronger leadership was the number one limitation with both the C-suite and non-C-suite respondents in our survey.

Rao agrees. For him, the easy part is the technology. "Trust is the biggest barrier to adoption," Rao says. He uses autonomous cars as an analogy for the adoption of AI. Most people, he says, would not get into a driverless or fully autonomous car with no steering wheel. To help with the mindset change, as a way to hand over greater decision rights to the machine, human drivers will need to be in place initially to take control when passengers get nervous; however, over time we will develop the trust to totally hand over control to the machine.

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*"Algorithms create some kind of discipline in how we are going to approach the world, rather than allowing us to take each situation separately, fully on gut intuition. We basically are forced to be more systematic about our decisions."*

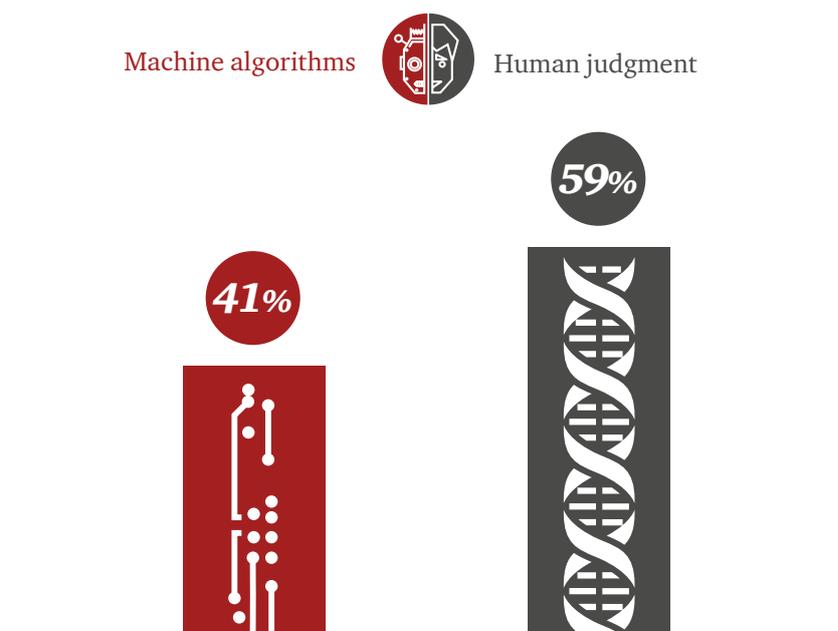
Dan Ariely, Professor of Psychology and Business Economics, Duke University

Now think of an autonomous car as an organisation and the people in it as executives and managers. They know where they want to go; they have the ultimate control to instruct the car to arrive at specific goals. When the car moves, it begins digesting more information than any of the passengers could, feeding precise insights on the most efficient route to their destination. The executives use all that precision to change course – maybe their destination – and to avoid accidents on the way. “First, people teach machines what to do, but then the machine advises people what they should do,” says Rao. “Because the machine is teaching – telling people what to do – the people get smarter and can tell the machine additional things it should do. Each one is helping and augmenting the other.”

The combination of data analytics and human intuition adds up to judgment that is more capable and effective. Missing the opportunity presented by these machines will have consequences. “Executives have to change or change will be forced on them,” Rao says. “Without an embrace of machine learning, at some point in the years ahead, your organisation will either go broke or a disruptor will arrive – and management will turn over to those who are truly data-driven.”

## **Machines don't eliminate human judgment, they change where it's needed**

Analysis informing my next big decision will primarily require...



Source: PwC's Global Data and Analytics Survey, July 2016. Q: What will the analysis informing your next strategic decision require? Global base: 2,106 senior executives.

### **PwC and Forbes Insights would like to thank the following individuals for their time and perspective.**

**Dan Ariely**, Professor of Psychology and Business Economics, Duke University

**Anand Rao**, Innovation lead in PwC's Data & Analytics practice

**Floyd Yager**, Chief Data Officer, Allstate Corporation

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