

AI NOW

BE READY

SURVEY RESULTS:

DEVELOPER PERSPECTIVES ON ARTIFICIAL
INTELLIGENCE IN 2018

Packt >

Introduction

Artificial Intelligence is the most important development in technology and society since the invention of the internet. Yet whereas the internet largely developed out of research programs in huge research and military institutions, artificial intelligence is being driven by engineers working in a diverse range of organizations - sometimes even working for themselves.

The likes of Facebook and Google may sit at the top of the pile when it comes to open source AI and deep learning tools, but **we all have access to them**. *The innovations and challenges posed by AI are ours - the engineers, analysts and architects that use software every single day.*

We wanted to get to know what AI actually means to people in software. Who's using it? What are they doing with it? And what do they think about it?

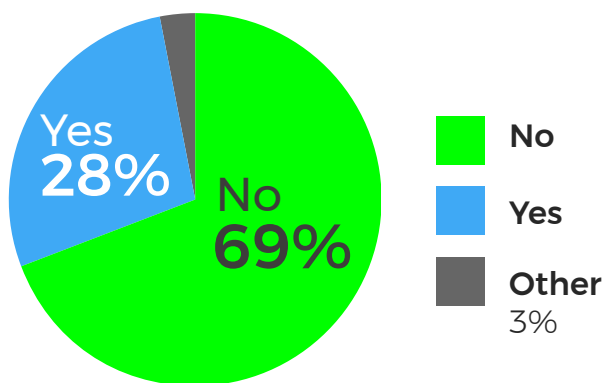
The findings here are based on responses from **2,869** technology professionals from around the world who were surveyed in August 2018.

Who's using AI vs. Who's learning it

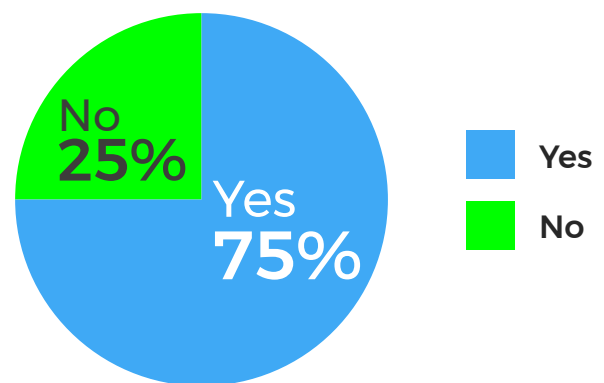
When we asked people if they were using artificial intelligence in their daily roles an overwhelming majority said no.

However, when we asked respondents if they were planning on learning AI-related tools in the next 12 months, we got very different responses:

Do you make use of any tools that enable AI in your day to day role?



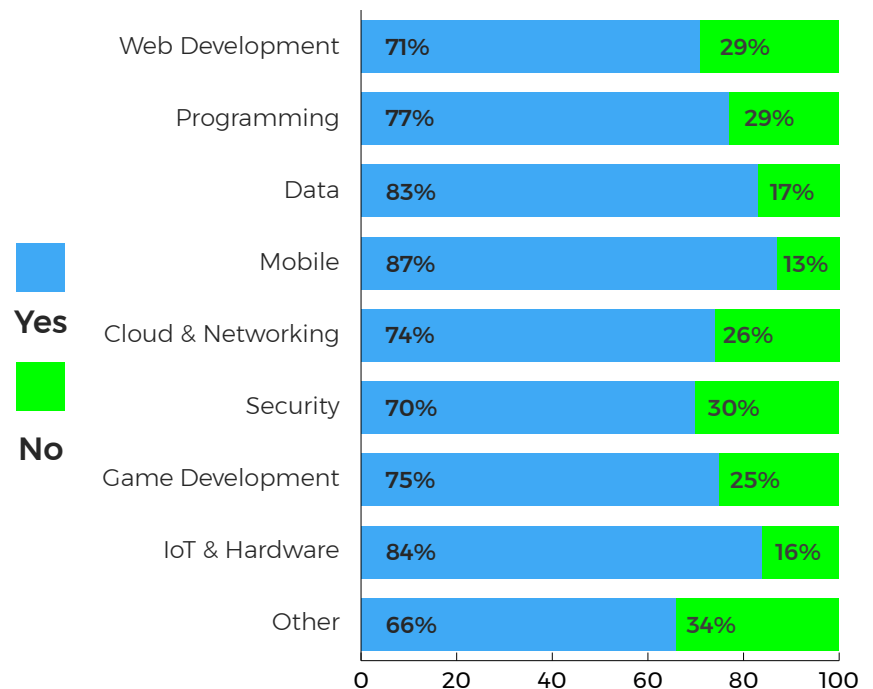
Are you planning on learning any new AI-related tools in the next 12 months?



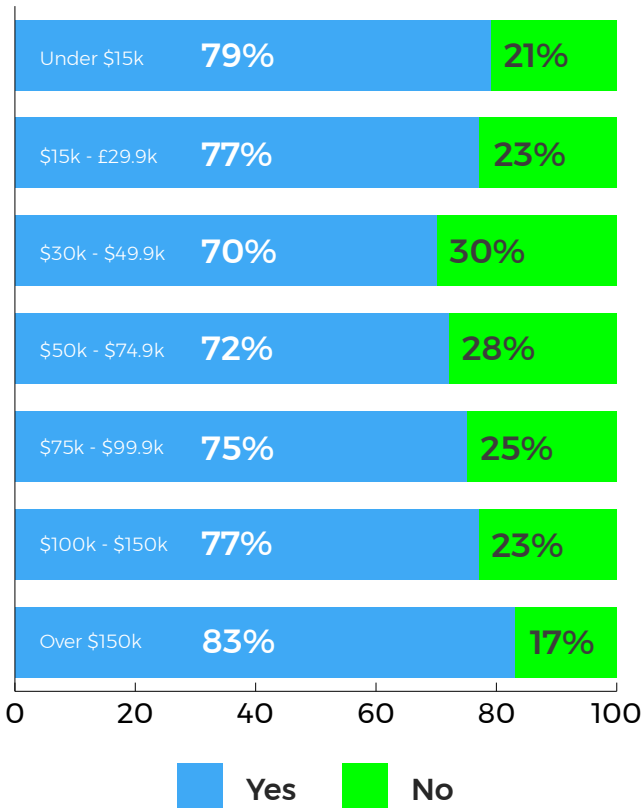
It's also interesting to break down responses to this question by job area.

Two areas stand out here - mobile and IoT. These are two areas in which artificial intelligence is likely to be deployed in very different ways, the one thing that unites them is that they are both very data-intensive. AI offers a solution to harness big data in a huge range of ways, whether that's developing mobile apps or transforming operational infrastructure in industry and logistics.

Are you planning on learning any new AI-related tools in the next 12 months?



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Another interesting way to look at this data is by the salaries of respondents.

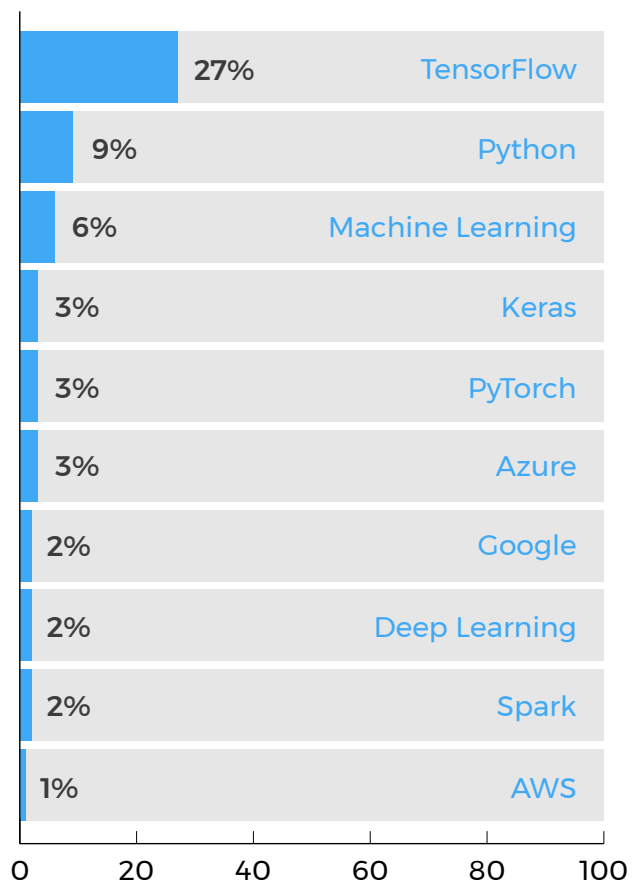
Here you can see a curve - those on the lowest salaries and those on the highest are the most likely to be learning AI-related tools.

Arguably, these two groups are those where the opportunities of artificial intelligence are most keenly felt. For those on the lowest salaries, possibly starting out in the field or looking to reskill, machine learning and AI could look like a way to progress your career quickly. For those on the highest salaries it's a case of taking full advantage of the tools that enable AI to remain at the cutting edge.

What are people learning?

We also wanted to know *what* people were learning. Here are the ten tools that were most listed as the tool people were planning on learning.

TensorFlow comes out on top - it was the top tool for 27% of survey respondents. However it's also interesting to see the top cloud platforms in the mix as well. Clearly cloud is playing an important part in making artificial intelligence more accessible to engineers from across the tech landscape.



Key concerns in Artificial Intelligence

The level of debate around artificial intelligence is incredibly fierce, with wildly differing opinions on what it means for society. With a wave of recent scandals throwing the spotlight on issues such as algorithmic bias, the complexities of artificial intelligence are today at the forefront of public consciousness.

With this in mind, we thought it was important to find out what people actually working across the engineering and software fields think about these issues.

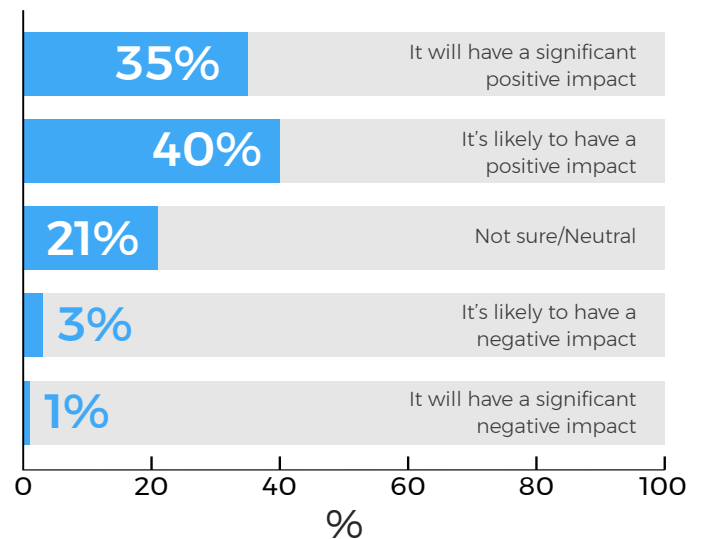
Impact of Automation

One of the biggest effects of artificial intelligence is automation. It's thought that 800 million jobs could be lost by 2030 because of it. With such a huge change looming over society, we wanted to get perspectives from people working in tech.

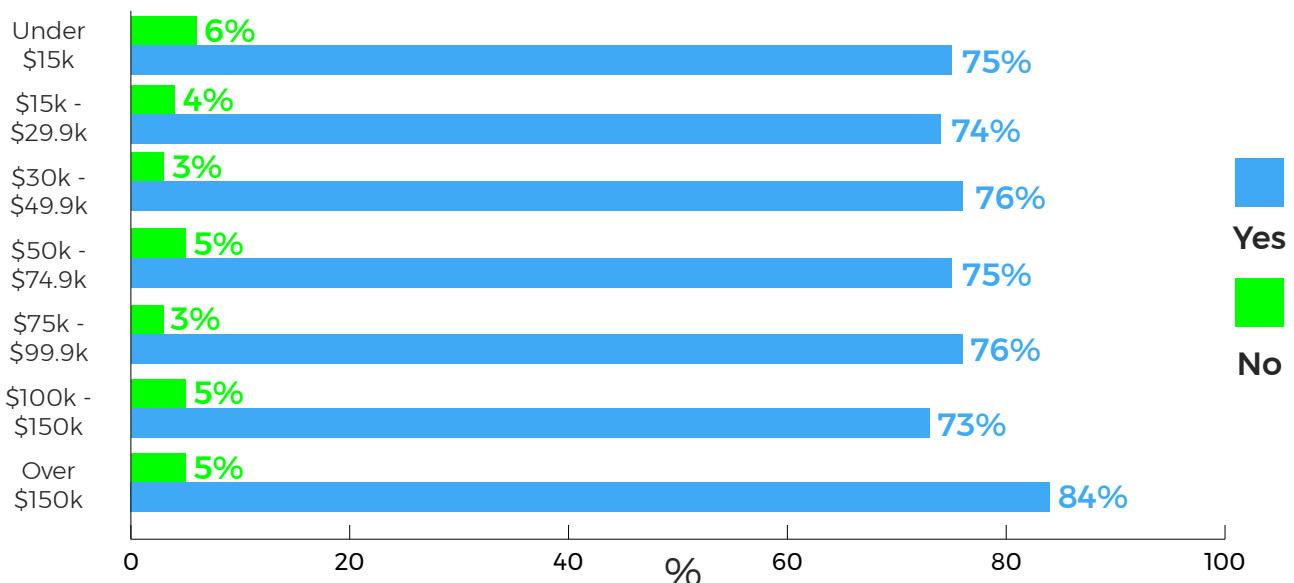
Overall, most respondents felt automation would have a positive impact.

However, the results were also interesting when we look at those who feel that automation will have a significant negative impact as well.

First we asked them about how they feel about automation in terms of their own career:



Who thinks automation will have a significant positive impact on their careers?



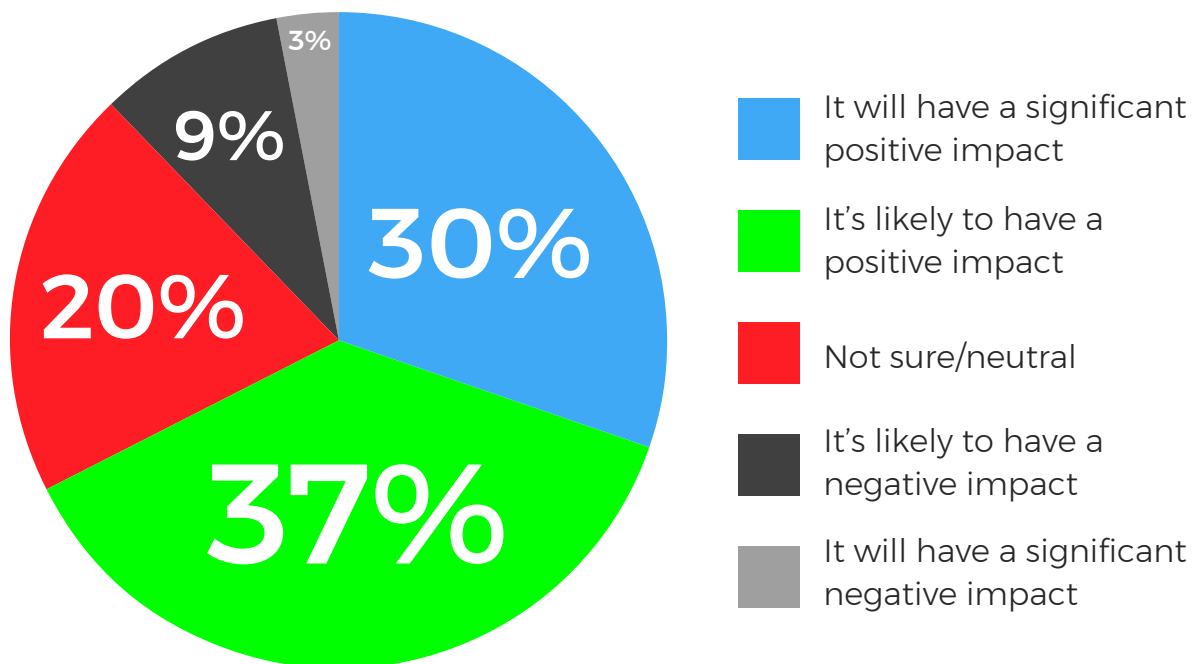
Those earning the lowest salaries and those earning the highest were most confident that the impact of automation would be positive.

"We need to adapt and embrace change or become a victim."

"While certain positions may become obsolete due to new technology, others will be greatly enhanced by incorporating AI engines. I do not foresee a point where cybersecurity is entirely managed by AI without human oversight or intervention."

"Pre-defined algorithms will become more common in data mining and the need for structured data less common. SQL and ETL may become less in demand."

We also asked what people thought about the impact of AI on society.



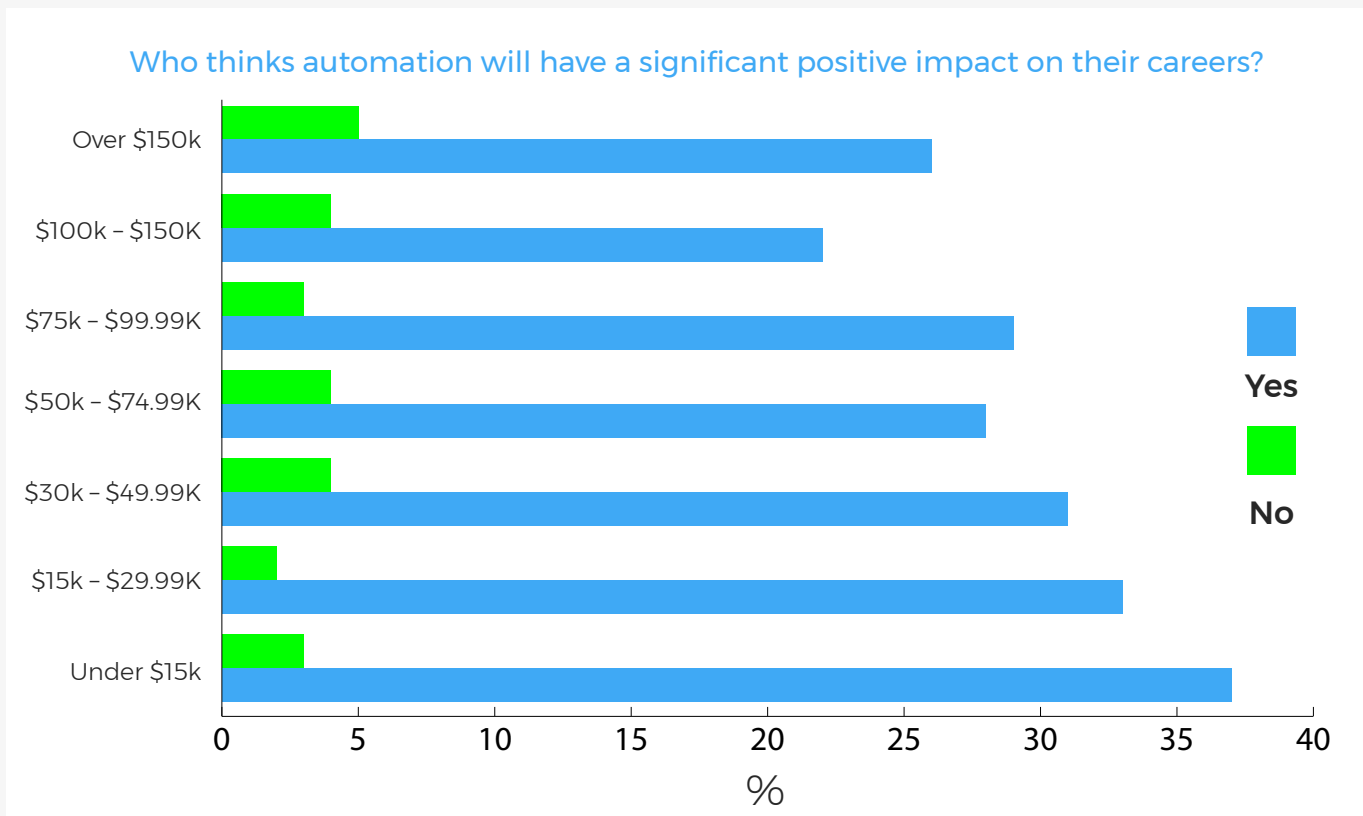
Again, the response was positive. However there was a *slightly* larger contingent of responses that believe automation will have a negative impact on society. This probably says a lot about the technology workforce - while the opportunities are there for people who have the skills and understanding, it's more likely that negative impact could be felt elsewhere.

“I feel that AI is being developed and deployed too quickly without enough testing.”

“AI can do shitty jobs better than shitty people, so AI will be shitty for them and that will impact all of us, but I think a lot of good will come of it too. It will be mixed, really, but your survey doesn’t offer that as an option.”

“If it eliminates jobs without replacement in other areas, it will be disastrous. That said, some jobs are so boring, they should be automated if possible.”

The split by salary also offers further useful insight on developer perspectives:



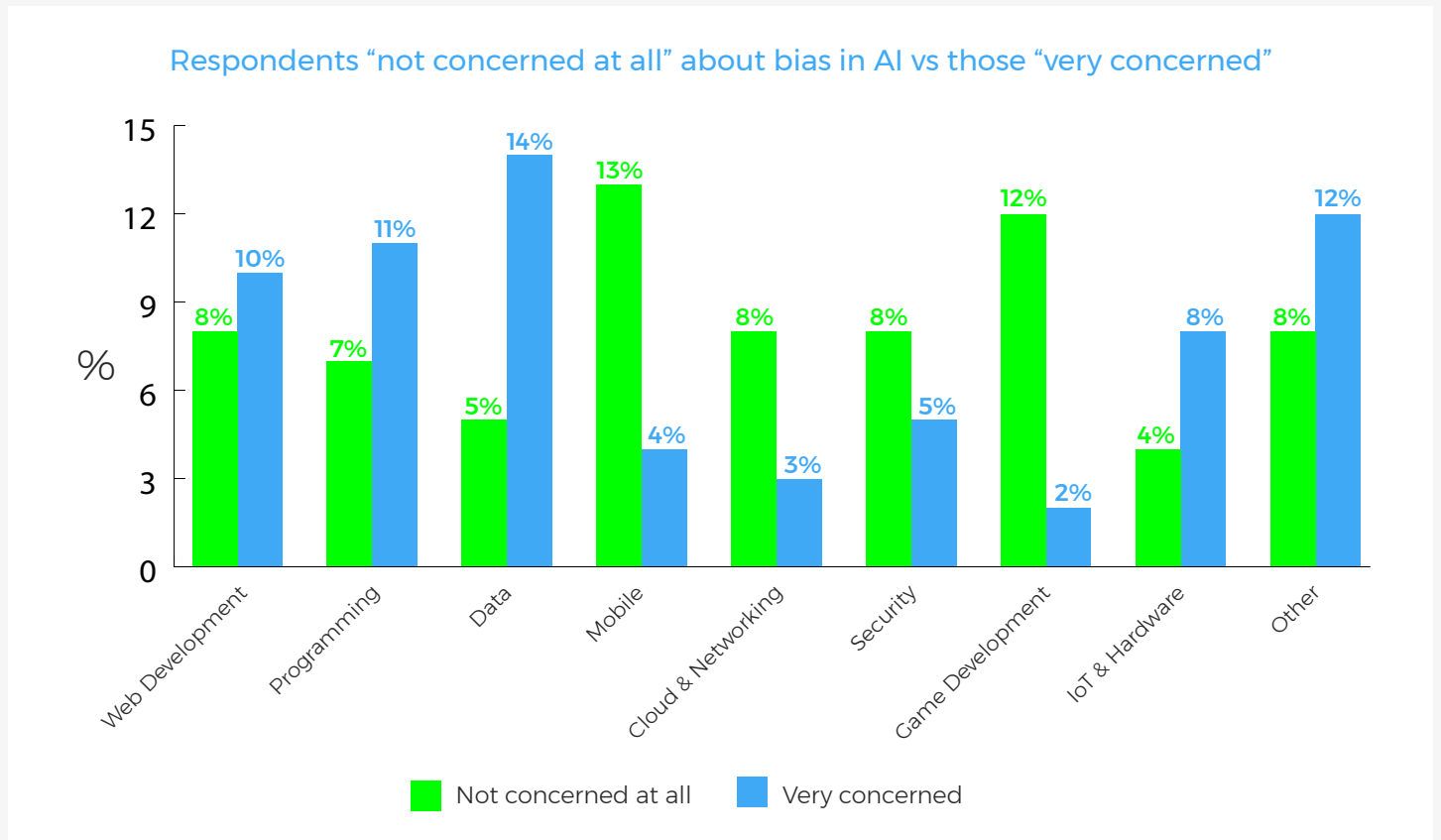
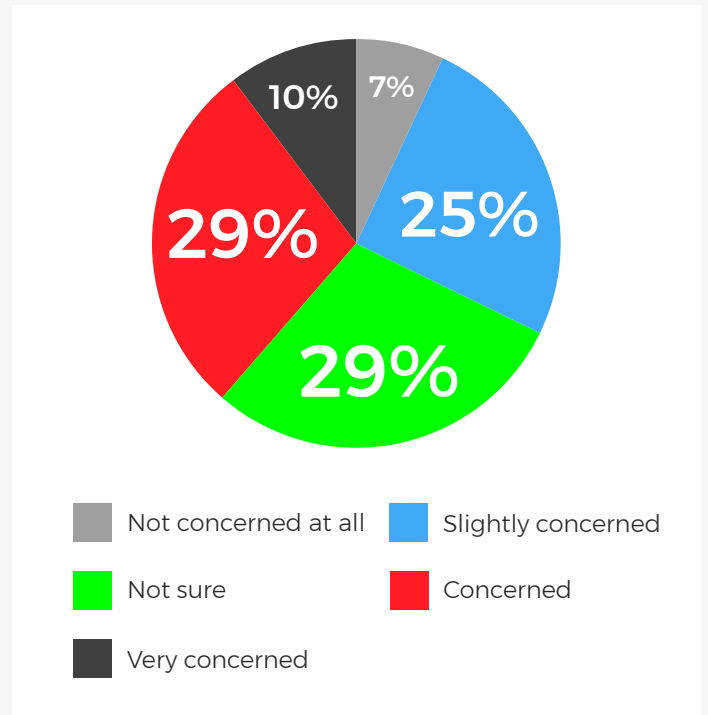
Bias in Artificial Intelligence

One of the most important issues to emerge in conversation around artificial intelligence is bias. In the context of broader questions around ethics in tech and engineering, the way that algorithms are constructed and contain the implicit biases of those engineering have been thrown into the spotlight.

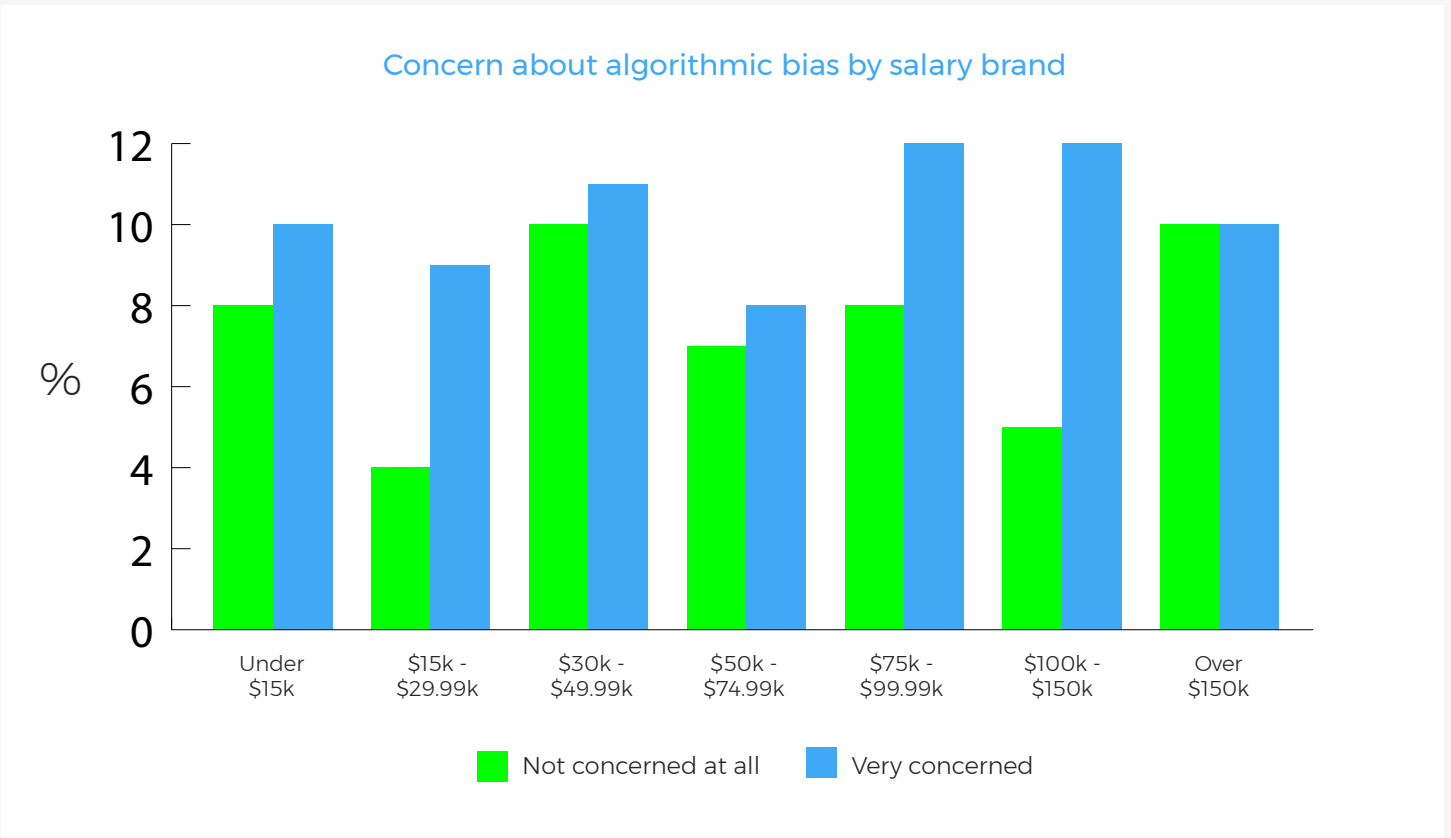
But we wanted to see how people across the tech industry felt about algorithmic bias.

Here are the results.

It's hard to discern a clear trend - there's an even spread of concern.



Here's the breakdown by salary:



"I'm concerned about the lack of careful selection of training data, and too much trust over a probabilistic decision."

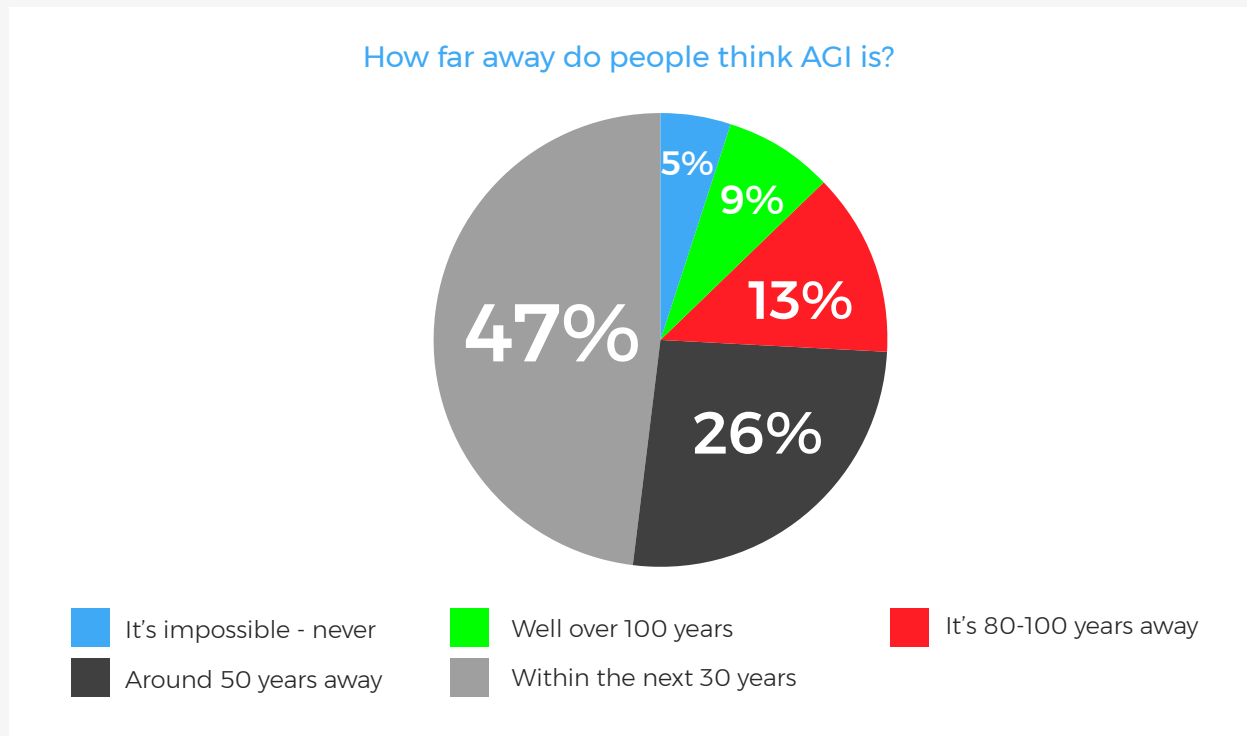
"As a CompSci/IT professional I understand this is a more subtle manifestation of 'Garbage In/Garbage Out'. As an African American, I have significant concerns about say, well-documented bias in say criminal sentencing being legitimized because 'the algorithm said so'."

"This is where good data scientists shine."

AGI

Artificial General Intelligence is a level of intelligence that can successfully mimic a human's. Essentially it's an artificial intelligence that isn't restricted to a particular purpose.

There's plenty of debate about how far we are from AGI - or even if it's possible at all. We asked people how far away we are from AGI. Here are the results:



So, almost half of respondents believe AGI is not only possible, but that it could happen within the next 30 years. Very few people say it's impossible.

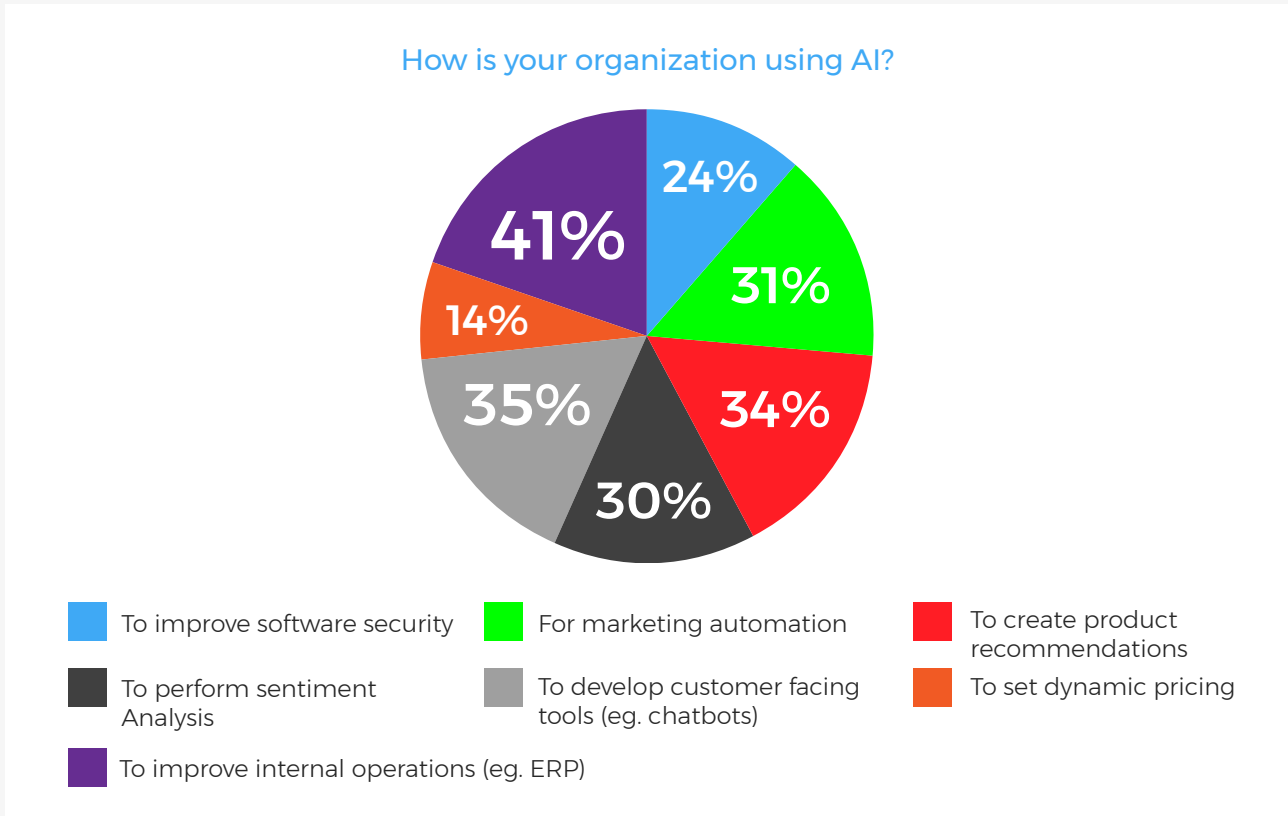
"This is a hard one to nail down, there is always some breakthrough that might make this possible earlier, but with current technologies this is not going to happen overnight."

"Something like AGI could perhaps be achieved within a 50 years timeframe, but in order for these technologies to achieve maturity, a wider timeframe should be considered."

"It is already happening, 10-15 years; I think that it is most dependent up when Quantum computers become widely available like laptops are today."

AI at work

Artificial Intelligence has a huge range of use cases. With just about every area apparently facing disruption thanks to AI, and with the trend so heavily hyped, we were interested in finding out how organizations are actually using artificial intelligence.



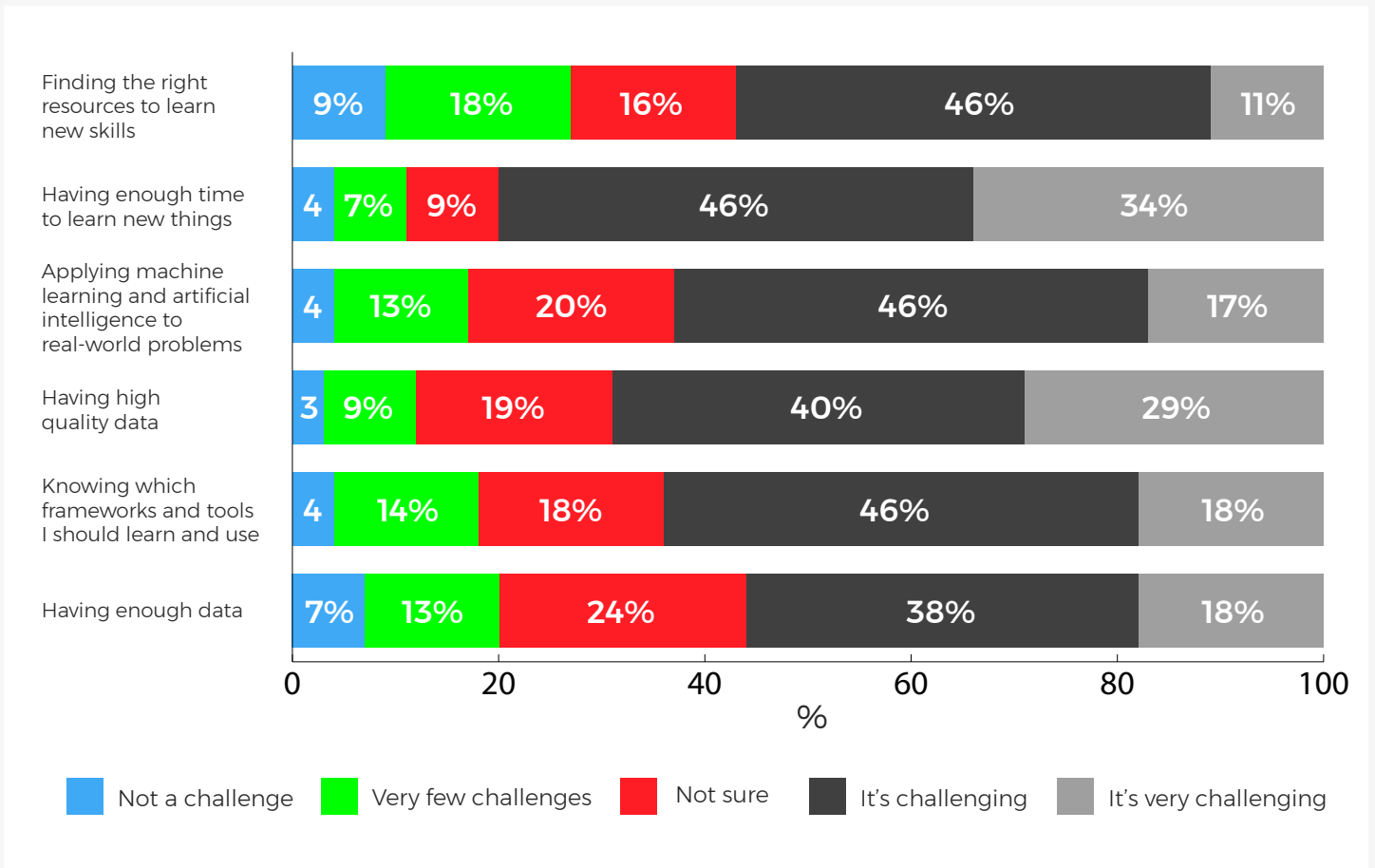
There's an even spread of responses, but operational purposes does seem to have an edge. You can also see that chatbots are becoming a reality for many organizations as well.

"I plan to leave my organization because it isn't adopting AI fast enough for me to keep up with the job market."

Biggest professional challenges

Like any trend, artificial intelligence poses many challenges, both personally and organizationally. The nature of these challenges often gets lost in hype, so we wanted to find out what people felt were the biggest challenges in terms of AI.

Here's what people thought personally:



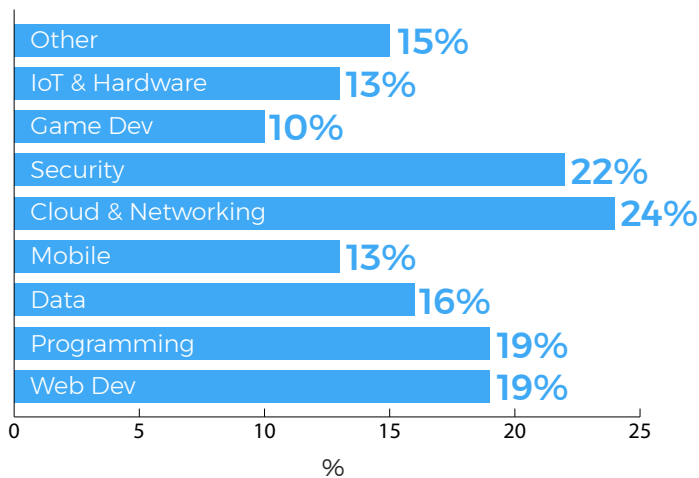
"Keeping abreast of technological changes and progress: learning the appropriate tools and not those that may become obsolete and quickly outdated."

"Having enough of the right kind of data. Organizations need to prioritize data efforts by making the manager report high up in the organization and removing the project from the normal budgeting process."

"Enlightening management is my biggest challenge."

"I actually need large quantities of BAD but logically consistent data so that the systems can learn."

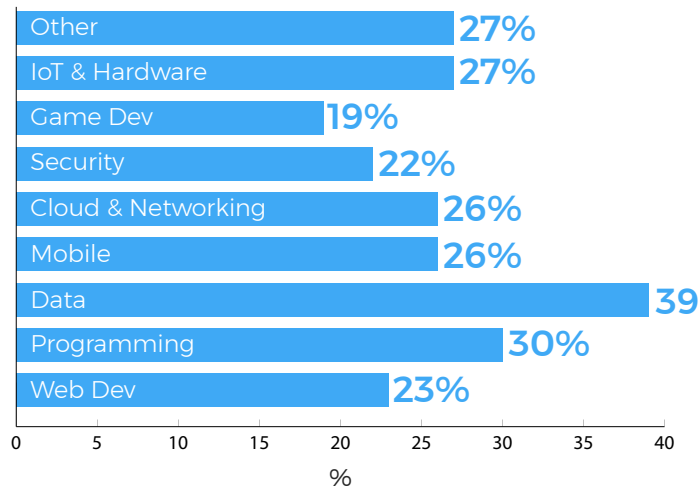
Knowing which frameworks and tools I should learn is “very challenging”



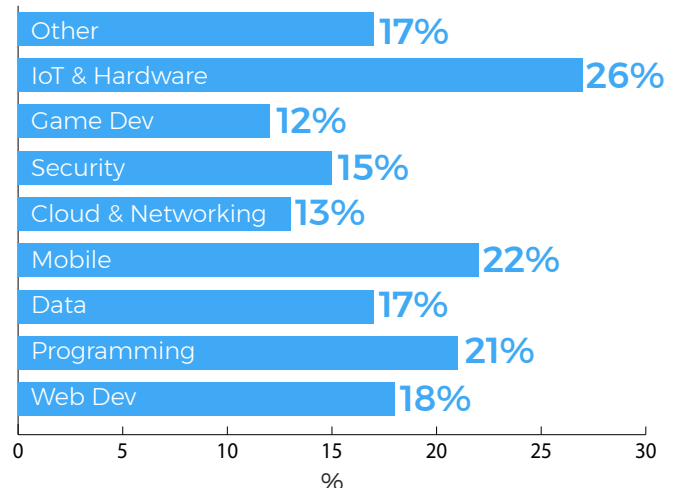
Let's look at how different areas feel about each of these challenges.

Knowing which frameworks and tools to learn is a challenge across *all areas of tech*. However, respondents working in cloud and networking and security report this to be the *biggest challenge*. This perhaps says something important about the wealth of choice when it comes to AI tools in these areas. In the cloud space in particular, there are such a huge range of options out there for engineers and architects that making a decision about what's right can be incredibly difficult.

Having high quality data is “very challenging”



Having enough data is “very challenging”



These two graphs present respondents' reactions to two similar but subtly different challenges within artificial intelligence and machine learning.

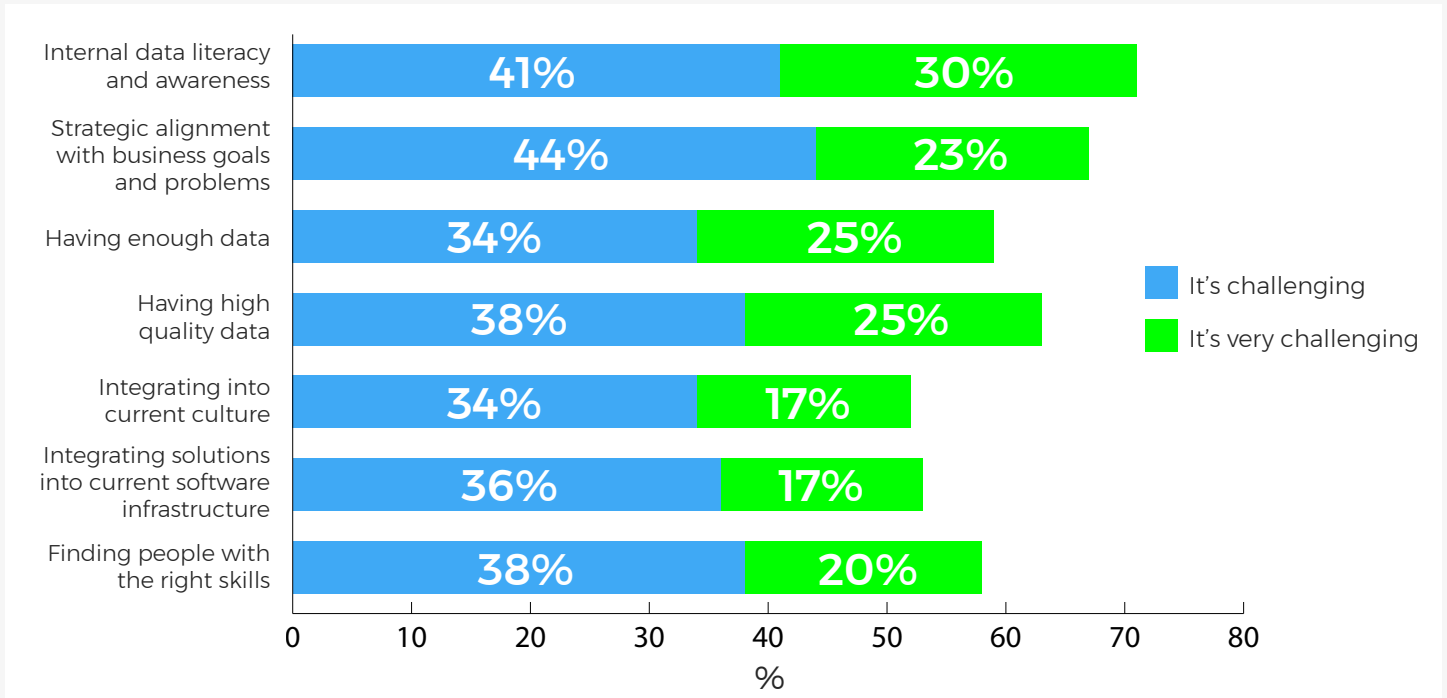
In the first graph we can see attitudes to data quality - this proves to be the biggest challenge for those working within data science and analytics specifically. Arguably it could be the case that these are people who have the most acute awareness of the impact of poor quality data, and have been living through its effects ever since the advent of big data.

The problem of quantity, however, is the biggest challenge for a different group: those working in IoT.

At first glance this might be surprising: IoT is ostensibly an area where there is plenty of data. However, what this might suggest is that IoT projects aren't quite capable of capturing the levels of data required to make artificial intelligence initiatives effective. So, yes, they are ambitious in terms of data quantity, but the infrastructure isn't in place to train the algorithms in a way people want.

Implementation Challenges

Like any big tech trend, adopting and actually using artificial intelligence can be difficult. But what about adopting and implementing artificial intelligence is a particular pain point?



Two areas stood out here as the biggest challenges for respondents: hiring people with the right skills and integrating artificial intelligence into established systems.

The challenges, then, are both internal and external, and go some way to explaining why utilizing artificial intelligence effectively can be so tough. Indeed, the question of skills gap might well be tied to internal challenges. True, it could be the case that there simply aren't enough people with skills to actually perform machine and deep learning, but just as likely, the people with the skills do the work aren't able to inside many organizations' current infrastructure.

"Top management have little awareness of what AI really is."

"GDPR makes it very difficult to correlate data in a useful manner."

This isn't going to be easy to tackle, It's going to require significant leadership and a real commitment to be flexible and open minded enough to embrace the change needed to embed artificial intelligence into the way we work - on both the part of new AI practitioners and those responsible for technical decision making.

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