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5 BIG MYTHS
OF AI AND MACHINE LEARNING DEBUNKED

Artificial intelligence (AI) and machine learning (ML) are already powering tools that can give your business decision-making processes a massive upgrade. Here's what you really need to know.

IT'S HARD TO BELIEVE THAT A TERM THAT DATES BACK TO 1955 IS ONE OF THE HOTTEST TOPICS IN TECHNOLOGY IN 2018.

AI has been with us in one form or another for over 60 years and yet it seems to be more misunderstood today than ever.

It's not for lack of trying. Venture capital investment in AI now tops $3 billion annually, and the number of active startups in the U.S. that are developing AI technologies has gone up by a factor of 14 since 2000. A huge number of consumer products are now being built with AI, from smartphones that understand what we say to smart dolls that can understand how your child feels.

But in the enterprise, the sentiment surrounding AI still seems to stress caution. First-movers aside, executives are hesitant to implement AI and machine learning systems in their organization — and that's if they even understand the difference between the two. AI sounds good in theory, but what is the real-world value of machine learning? Will true AI really ever come to pass?

AI is here, it's already proving itself in the market, and it's increasingly being built with business in mind. Those billions of dollars pouring into AI startups are already having an impact, turning out powerful tools that leverage cutting-edge cognitive technologies that can give your business decision-making processes a massive upgrade. The tech is getting easier to use than ever, too. You won't need an army of Stanford Ph.D.'s to manage many of today's AI tools and it won't kick you out of the corner office, either.

The myths around artificial intelligence can get pretty dense, so we've taken five of the biggest and dissected them to help you understand the truth about today's AI landscape. We'll address some major misconceptions to set your business on the right path toward success in the world of AI.

MYTH #1:
AI AND ML ARE THE SAME THING

As with many new technologies, artificial intelligence has created a gold rush effect across a lot industries. All manner of products have been described as having been built with AI, to the point where the term has become a buzzword that has seemingly lost much of its meaning.

So let's try to get some of that meaning back by breaking down the various forms of AI to understand what capabilities we really have available to us today.

AT ITS SIMPLEST LEVEL, AI CAN BE SPLIT INTO TWO CATEGORIES: STRONG AI AND WEAK AI. THE NAMES HAVE EVOLVED IN RECENT YEARS, BUT THE TERMS CAN GENERALLY BE THOUGHT OF IN THE FOLLOWING WAYS.

WEAK AI

Weak AI, also sometimes called "narrow AI," is a collection of technologies that rely on algorithms and programmatic responses to simulate intelligence, generally with a focus on a specific task. When you use a voice recognition system like Alexa to turn on the lights, that's weak AI in action. Alexa may sound smart, but it doesn't have any advanced understanding of language and can't determine the meaning behind the words you speak. The program simply listens for key sounds in your speech and, when it detects them, follows its programming to execute certain actions. To users, this can seem surprisingly intelligent — and voice recognition is far from a simple computing task — but in reality there is no actual "thinking" going on behind the scenes. Non-player characters (NPCs) in games are another good example of weak AI. While they take human-like action, in reality they're simply following a pre-programmed series of actions designed to mimic how a human would play the game.

STRONG AI

Also called "true AI," strong AI in contrast, is intended to think on its own. These are systems built with the human brain as their archetype. Strong AI is designed to be cognitive, to be aware of context and nuance, and to make decisions that are not programmatic in nature but rather the result of a reasoned analysis. Strong AI, in general, is designed to learn and adapt, to make a decision tomorrow that is better than the one it made today. None of this is an easy task, which is why most examples of AI you'll encounter today are the "weak" form. Strong AI is a new, complex and varied category with numerous sub-branches. Because the goals of a strong AI system vary from one implementation to the next, two strong AI systems almost never look the same.
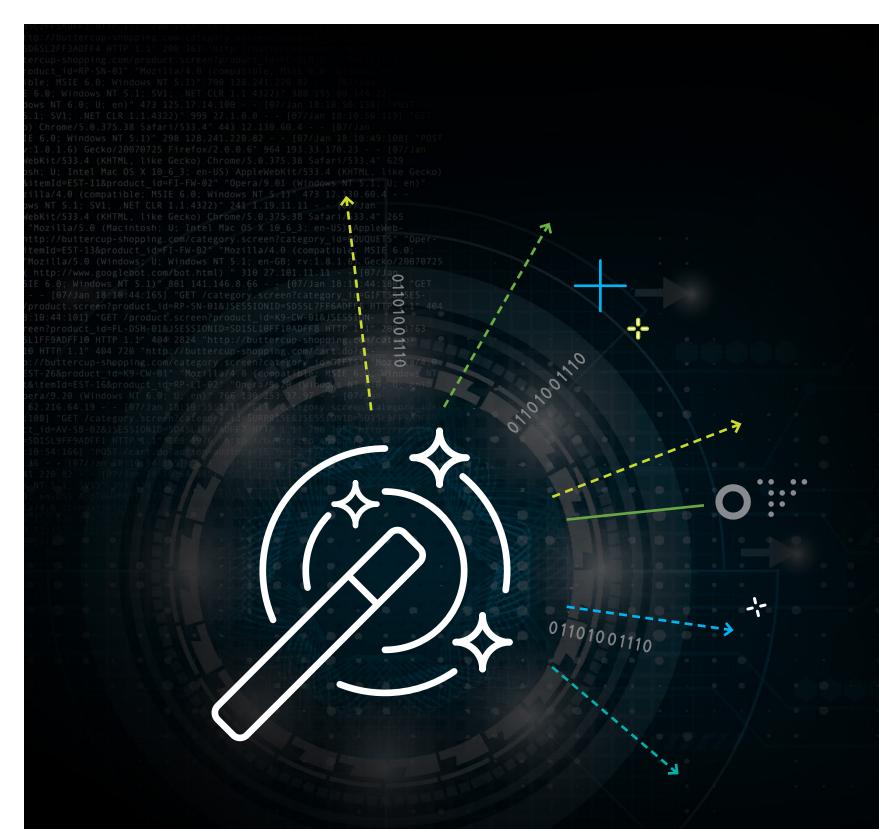
WITH THIS DISTINCTION IN MIND, WHAT THEN IS MACHINE LEARNING?

PUT SIMPLY, MACHINE LEARNING IS A SPECIFIC TYPE OF AI PUT INTO PRACTICE, WITH THE GOAL OF GIVING A COMPUTING DEVICE ACCESS TO SOME STORE OF DATA AND ALLOWING IT TO LEARN FROM IT.

Not all forms of AI are defined as machine learning. When Alexa turns on the lights, it doesn't learn anything. It just waits to be told to turn the lights off. In contrast, an ML system may be given a data feed — say, temperature and tolerance information from sensors on a piece of manufacturing equipment — and be asked to draw conclusions about it. This may involve searching that data for trends, patterns, and anomalies, information that might not be obvious to a human observer. Ultimately, the ML system may conclude that a machine needs to be repaired because it is about to fail, or that it needs to be run at a lower speed. As the machine learning algorithm continues to learn from this data, it becomes progressively easier for it to generate additional insights down the line, and those insights become more accurate.

ML is just one example of AI put into use. A variety of other terms also tend to get conflated with general AI concepts. For example, deep learning is a subset of machine learning that uses software to mimic brain activity as closely as possible.

The bottom line: AI is hard. AI is complicated. And people are throwing around AI terms conflating its meaning. It's important to understand the distinctions so you know what you're getting.

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MYTH #2: AI IS A MAGIC WAND

As exciting as an AI-enabled hair dryer and AI-powered yoga pants sound (yes, those are real things), there is a time and a place for AI, at least as it stands today.
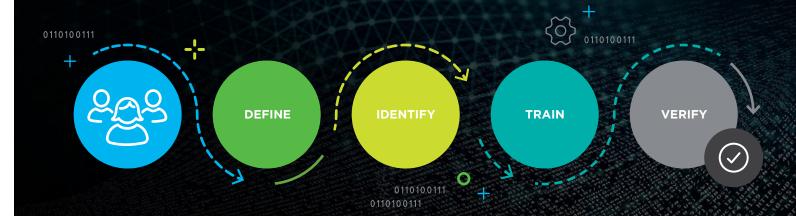
AT ITS MOST FUNDAMENTAL LEVEL, THE KEY TO SUCCESSFULLY BUILDING AN AI OUTCOME, REGARDLESS OF THE INDUSTRY IN WHICH IT'S DEPLOYED AND ITS LEVEL OF COMPLEXITY, IS TRAINING.

A spam filter must be trained on how to recognize a good email message from a bad one. A voice recognition AI must listen to countless hours of spoken dialogue before it can parse what is being said with any degree of accuracy. AI-enabled factory floor initiatives typically must gather several million gigabytes of data each week in order to have enough analytical data to make reasoned decisions about what might happen in the future.

All of these are examples of training, and it's not just a game of volume but one of quality, too. Successful AI algorithms must be trained on the right data sources, or they simply won't be able to make good decisions. If you were to open up your email inbox and tag all the messages from your spouse as spam, then tag all the emails from Nigerian princes as good. You'll promptly see for yourself how quickly AI can go off the rails when it's trained the wrong way. The same is true in a more advanced industrial setting. If a sensor is miscalibrated and feeds inaccurate information to an algorithm tasked with monitoring equipment, all those gigabytes of data will end up being useless or worse, as the AI will use bad data in the course of reaching inaccurate conclusions.

THE POINT OF THIS IS THAT AI IS NOT NECESSARILY A CURE-ALL. THERE IS NO "AI SWITCH" OR "AI PLUGIN" THAT CAN TAKE ANY OLD TECHNOLOGY AND SOMEHOW GIVE IT COGNITIVE ABILITY.

Humans have to define the problem, identify an appropriate AI technology to solve it, train the tool with the correct data, and then verify that the results are valid. Even the most powerful AI tools developed to date have to be carefully managed over time so they don't run off the rails.

DEFINE IDENTIFY TRAIN VERIFY

ONCE AN AI TOOL HAS GENERATED RESULTS, THE WORK ISN'T OVER.

Many AI professionals are finding that they learn more when an AI algorithm returns the wrong answer than the right one. This effect is visible at both the consumer and the industrial level. When an AI-based spam filter miscategorizes an incoming message, the user has the chance to retrain the tool by categorizing it properly. This gives the algorithm new insight into what it might have missed the first time around; learning from the error makes the tool incrementally more powerful. If the spam filter had not been retrained, it would be no more accurate the next time around and would likely make the same mistake again.

Similarly, in a manufacturing setting, imagine that an AI tool directs that a machine be taken offline because a failure in a key part is imminent. If the part does not fail, then what? What happens if a security-focused AI blocks your traveling sales force from accessing the network because it wrongly assumed they were hackers? Because of the logical nature of AI, a developer can determine why the AI made these specific decisions and can work backwards to determine what data it relied on in the process. This may reveal flaws in the data, an error of logic processing, or some other bug that would otherwise go unnoticed.

MYTH #3:
MOST COMPANIES DON'T HAVE THE RESOURCES OR THE NEED FOR AI/ML

You don't need a Ph.D and there is no use case too small for smart technology.

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING, BY THEIR VERY NAMES, DO NOT EXACTLY CONVEY SIMPLICITY. AND IN TRUTH, THESE ARE DAZZLINGLY COMPLEX TECHNOLOGIES THAT, UNDER THE HOOD, ARE FAR FROM ACCESSIBLE TO THE LAYPERSON.

So that means you need an army of Ph.D.-carrying data scientists and troves of cash to implement AI, right? Not quite. It's important to understand the difference between building an artificial intelligence solution from the ground up and implementing existing AI tools within your organization. The first of these is extremely difficult. The second is getting easier every day.

Consider all of the technological tools you use in the course of a day: an email client, or productivity tools like your digital assistant or spreadsheets. They're not simple technologies, but you're able to master them without knowing what's happening behind the curtain. The same thing is happening to AI, as tools are becoming increasingly accessible.

Money is pouring into the so-called democratization of AI, with tools such as Google's TensorFlow making AI easier to use in all kinds of environments. Some technologies have been tailored for specific tasks like helping catch fraudsters with behavioral biometrics. While we might not be at the level of pure point-and-click when it comes to implementing an AI system, these tools are now accessible to anyone willing to learn and many are open source.

You may also be under the impression that your business or specific use case is too small or insignificant to merit an investment in AI, that your environment is just not complex enough to benefit from the technology. In many cases, this is also not true. Even small businesses and other environments limited in scope and scale can benefit from the lessons provided by AI and ML. In a small business or business unit setting, you might task AI with testing and developing better social media ads, automating and improving customer service requests, or searching for patterns around when and why competitors are changing prices or product offerings. All of these AI-driven activities are readily accessible to even single-owner operations.

BUT WHAT ABOUT DATA, YOU MIGHT ASK.

Don't you need terabytes worth of data, all carefully curated, to train any AI tool?

WHILE IT'S TRUE THAT AI AS A RULE THRIVES ON A LARGE AND ACCURATE POOL OF DATA, YOUR BUSINESS DOESN'T NEED TO HAVE ALL OF THAT DATA IN-HOUSE FOR IT TO BE UTILIZED.

A tool that monitors and analyzes social media collects its data from external sources as it goes. An AI system that relies on data feeds such as ambient temperature, housing prices, or neighborhood demographics typically pulls all of this information from publicly available sources.

There's really no need that's "too small." Remember that a tiny improvement in a key business vector can have a huge impact on the bottom line. A system that reduces production mistakes by just 1 percent or that correctly recommends a price increase of just a few pennies could equate to millions of dollars in avoided costs or additional profits. The challenge is largely in identifying where these opportunities could lie.

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MYTH #4:
AI AND ML WILL REPLACE ME

Worried that AI will eliminate your job in the near future? You're not alone. McKinsey recently suggested that by 2030, 375 million workers — 14 percent of the global workforce — would need to "switch occupational categories" as machines become increasingly capable of doing work previously reserved for humans. In the shorter term, Gartner predicts that by 2020, 1.8 million jobs will be eliminated due to the increasing power of AI. The result has been a fairly breathless series of news reports that predict a full on Apocalypse.

BUT SOMETIMES BURIED IN THESE REPORTS ARE A FEW KEY DETAILS THAT SHOULD CALM THE MASSES.

THERE IS A FUNDAMENTAL TRUTH TO AI: IT CAN'T OPERATE IN A VACUUM.

It requires humans to develop, deploy, manage and maintain it. That means jobs. In the same Gartner report, the firm predicts that those 1.8 million jobs lost will be offset by 2.3 million new jobs that will be created, for a net increase of 500,000 positions in 2020, and **a net increase of 2 million jobs in 2025.**

NET INCREASE 2 MILLION NEW JOBS IN 2025

NET INCREASE 500,000 JOBS

1.8 MILLION JOBS LOST

2.3 MILLION JOBS CREATED

WHY WON'T AI DECIMATE EMPLOYMENT AS WE KNOW IT?

HERE ARE SOME FACTS TO CONSIDER:

→ **Most AI is weak AI.**
These are not systems that can replicate the abstract ways that a human thinks and works, but are instead designed to target narrowly defined problems. In many cases, an AI and a human operator work hand in hand to solve that problem: The AI scours the data, looking for details that would otherwise take months of time to uncover, and the human checks that the AI's results are on target. The human operator is required to train the AI tool to perform tedious tasks, liberating the human operator to focus on the big picture. As these problems get increasingly difficult, the need for a human operator becomes even greater, not smaller.

→ **AI doesn't have innate knowledge of business processes.**
While many companies are migrating their business processes to more flexible systems that allow for the fluidity that AI often requires, these transitions are often lengthy and require significant human intervention to implement. This kind of transformation requires soft skills and a substantial amount of institutional knowledge about the business, its industry and its competitive environment. Only through a collaborative effort can an AI tool effectively recommend process automation and reconfiguration activities — all of which ensure that people will remain a key part of the puzzle for the long haul.

→ **For all of its intelligence, AI isn't always right.**
AI can not only go wrong: It can go catastrophically wrong. When that happens, a human — with his intuition, experience and ability to react quickly — is invariably needed to overcome the problem or pick up the pieces. What's worse: AI tools often don't even know they have made a mistake, which requires even more work from a human who can figure out how to prevent the problem from happening again.
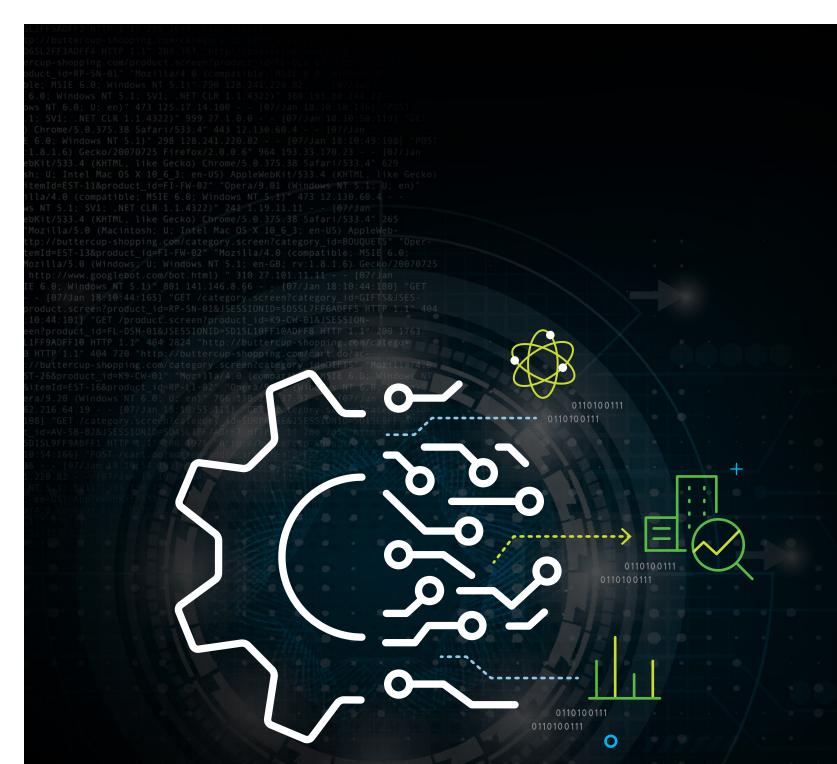
The takeaway from all of this is that in most instances AI, when done right, shouldn't be replacing people's jobs but rather complementing them. Sure, some jobs will vanish — it's hard to imagine that humans will still be driving taxis in 2050 — but we're likely to adapt and even thrive, just as we did when lamplighters and bowling alley pinsetters became obsolete decades ago.

> "Leave behind notions of vast teams of infinitely duplicable 'smart agents' able to execute tasks just like humans.
>
> Get [workers] excited and engaged with the idea that AI-powered decision support can enhance and elevate the work they do every day."
>
> Gartner's Whit Andrews

MYTH #5:
AI AND ML ARE STILL SCIENCE PROJECTS

AI is a technology that's decades away from making an impact and isn't something that business leaders need to pay attention to today, right? Wrong. More and more, leaders are finding that investments in AI and machine learning are paying off, and even pilot projects are turning in early, positive returns.

DELOITTE SURVEYED 250 EARLY ADOPTERS OF AI AND FOUND THAT 83 PERCENT SAID THEY

"HAVE ALREADY ACHIEVED EITHER MODERATE OR SUBSTANTIAL BENEFITS FROM THEIR WORK WITH THESE TECHNOLOGIES."

These benefits were seen across a wide spectrum of business activities, with the top three benefits noted as enhancements of the features or performance of the company's products, the ability to make better decisions, and the creation of new products altogether.

That said, the companies in the Deloitte survey added that AI still has room to grow before it truly transforms their businesses — but that will take less time than you might think. According to 76 percent of those surveyed, cognitive technologies will transform the business in three years or less. Only 7 percent gave a timeline for transformation beyond five years.

At this point, AI is on a path to become not just a tool to gain competitive advantage but rather a basic business requirement. Researchers have even noted that 63 percent of business leaders believe the pressure to reduce costs will require the use of AI. In other words, develop a strong AI strategy or your business might get left behind.

Sure, some of AI's most far-reaching concepts — computers that can replicate the human brain entirely, fully autonomous robots, and computer programs that design, code, and upgrade themselves — are years away from reality, moonshots that represent the eventual apex of AI's capabilities. But consider that AI tools can already win at *Jeopardy!*, poker, and chess, are able to detect breast cancer and are logging tens of thousands of miles behind the wheel of self-driving vehicles every day. In that context, the prospect of even those moonshot concepts really doesn't seem so far-fetched.

AI IS HERE TO STAY

While AI can be a game-changer that takes your business to the next level, taking your first steps with AI and machine learning does not have to be a monumental undertaking. Numerous tools on the market let you experiment with AI in a sandbox, targeting small "problem areas" that might have long stymied your attempts at improvement. The important thing is that you need to get started soon, before the competition masters these tools and jumps ahead of you in the marketplace.

AI is already having profound impact on the bottom line of businesses that were early movers into the field, with companies seeing improvements in customer satisfaction, decreases in manufacturing downtime, and better overall worker productivity. There's no blanket AI tool and no single metric that will improve once these tools are implemented: It's up to you to determine where to target artificial intelligence, based on the specific challenges you see in your organization.

Of course, getting there means overcoming some hurdles. You may have to educate nervous staff members about the realities of AI and job displacement, instead turning those fears around by showcasing how AI can improve their work lives and actually brighten their future career prospects. Smaller businesses may also need to overcome the sentiment that AI is a game that only the largest of enterprises can play, which is where some targeted pilot projects can really help.

While AI is already showcasing real-world results, the future of these tools is even more exciting. It's a journey, however, that you need to begin today.

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