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How to make AI work for your business

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A survey of more than 3,000 executives sheds light on how businesses are using AI, offering lessons for CEOs, as we explain in this article for *Harvard Business Review*.

The buzz over artificial intelligence (AI) has grown loud enough to penetrate the C-suites of organizations around the world, and for good reason. Investment in AI is growing and is increasingly coming from organizations outside the tech space. And AI success stories are becoming more numerous and diverse, from Amazon reaping operational efficiencies using its AI-powered Kiva warehouse robots, to GE keeping its industrial equipment running by leveraging AI for predictive maintenance.

While it's clear that CEOs need to consider AI's business implications, the technology's nascence in business settings makes it less clear how to profitably employ it. Through a study of AI that included a survey of 3,073 executives and 160 case studies across 14 sectors and ten countries, and through a separate digital research program, we have identified ten key insights CEOs need to know to embark on a successful AI journey.

Don't believe the hype—not every business is using AI ... yet.

While investment in AI is heating up, corporate adoption of AI technologies is still lagging. Total investment (internal and external) in AI reached somewhere in the range of \$26 billion to \$39 billion in 2016, with external investment tripling since 2013. Despite this level of investment, however, AI adoption is in its infancy, with just 20 percent of our survey respondents using one or more AI technologies at scale or in a core part of their business, and only half of those using three or more. (Our results are weighted to reflect the relative economic importance of firms of different sizes. We include five categories of AI technology systems: robotics and autonomous vehicles, computer vision, language, virtual agents, and machine learning.)

For the moment, this is good news for those companies still experimenting with or piloting AI (41 percent). Our results suggest there's still time to climb the learning curve and compete using AI.

However, we are likely at a key inflection point of AI adoption. AI technologies such as neural-based machine learning and natural-language processing are beginning to mature and prove their value, quickly becoming centerpieces of AI technology suites among adopters. And we expect at least a portion of current AI piloters to fully integrate AI in the near term. Finally, adoption appears poised to spread, albeit at different rates, across sectors and domains. Telecom and financial services are poised to lead the way, with respondents in these sectors planning to increase their AI tech spend by more than 15 percent a year—seven percentage points higher than the cross-industry average—in the next three years.

Believe the hype that AI can potentially boost your top and bottom line.

Thirty percent of early AI adopters in our survey—those using AI at scale or in core processes—say they've achieved revenue increases, leveraging AI in efforts to gain market share or expand their products and services. Furthermore, early AI adopters are 3.5 times more likely than others to say they expect to grow their profit margin by up to five points more than industry peers. While the question of correlation versus causation can be legitimately raised, a separate analysis uncovered some evidence that AI is already directly improving profits, with return on AI investment in the same range as that for associated digital technologies such as big data and advanced analytics.

Without support from leadership, your AI transformation might not succeed.

Successful AI adopters have strong executive-leadership support for the new technology. Survey respondents from firms that have successfully deployed an AI technology at scale tend to rate C-suite support as being nearly twice as high as that at those companies that have not adopted any AI technology. They add that strong support comes not only from the CEO and IT executives but also from all other C-level officers and the board of directors.

You don't have to go it alone on AI—partner for capability and capacity.

With the AI field recently picking up its pace of innovation after the decades-long “AI winter,” technical expertise and capabilities are in short supply. Even large digital natives such as Amazon and Google have turned to companies and talent outside their confines to beef up their AI skills. Consider, for example, Google's

acquisition of DeepMind, which is using its machine-learning chops to help the tech giant improve even core businesses such as search optimization. Our survey, in fact, showed that early AI adopters have primarily *bought* the right fit-for-purpose technology solutions, with only a minority of respondents both developing and implementing all AI solutions in-house.

Resist the temptation to put technology teams solely in charge of AI initiatives.

Compartmentalizing accountability for AI with functional leaders in IT, digital, or innovation can result in a hammer-in-search-of-a-nail outcome: technologies being launched without compelling use cases. To ensure a focus on the most valuable use cases, AI initiatives should be assessed and co-led by both business and technical leaders, an approach that has proved successful in the adoption of other digital technologies.

Take a portfolio approach to accelerate your AI journey.

AI tools today vary along a spectrum ranging from tools that have been proven to solve business problems (for example, pattern detection for predictive maintenance) to those with low awareness and currently limited but high-potential utility (for example, application of AI to develop a competitive strategy). This distribution suggests that organizations could consider a portfolio-based approach to AI adoption across three time horizons:

Short-term: Focus on use cases where there are proven technology solutions today, and scale them across the organization to drive meaningful bottom-line value.

Medium-term: Experiment with technology that's emerging but still relatively immature (deep-learning video recognition) to prove its value in key business use cases before scaling.

Long-term: Work with academia or a third party to solve a high-impact use case (augmented human decision making in a key knowledge-worker role, for example) with bleeding-edge AI technology to potentially capture a sizable first-mover advantage.

Machine learning is a powerful tool, but it's not right for everything.

Machine learning and its most prominent subfield, deep learning, have attracted a lot of media attention and received a significant share of the financing that has been pouring into the AI universe, garnering nearly 60 percent of all investments from outside the industry in 2016.

But while machine learning has many applications, it is just one of many AI-related technologies capable of solving business problems. There's no one-size-fits-all AI solution. For example, the AI techniques implemented to improve customer-call-center performance could be very different from the technology used to identify credit-card-payments fraud. It's critical to look for the right tool to solve each value-creating business problem at a particular stage in an organization's digital and AI journey.

Digital capabilities come before AI.

We found that industries leading in AI adoption—such as high tech, telecom, and automotive—are also the ones that are the most digitized. Likewise, within any industry, the companies that are early adopters of AI have already invested in digital capabilities, including cloud infrastructure and big data. In fact, it appears that companies can't easily leapfrog to AI without digital-transformation experience. Using a battery of statistics, we found that the odds of generating profit from using AI are 50 percent higher for companies that have strong experience in digitization.

Be bold.

In a separate study on digital disruption, we found that adopting an offensive digital strategy was the most important factor in enabling incumbent companies to reverse the curse of digital disruption. An organization with an offensive strategy radically adapts its portfolio of businesses, developing new business models to build a growth path that is *more robust* than *before* digitization. So far, the same seems to hold true for AI: early AI adopters with a very proactive, strictly offensive strategy report a much better profit outlook than those without one.

The biggest challenges are people and processes.

In many cases, the change-management challenges of incorporating AI into employee processes and decision making far outweigh

technical AI implementation challenges. As leaders determine the tasks that machines should handle, versus those that humans perform, both new and traditional, it will be critical to implement programs that allow for constant reskilling of the workforce. And as AI continues to converge with advanced visualization, collaboration, and design thinking, businesses will need to shift from a primary focus on process efficiency to a focus on decision-management effectiveness, which will further require leaders to create a culture of continuous improvement and learning.

Make no mistake: the next digital frontier is here, and it's AI. While some firms are still reeling from previous digital disruptions, a new one is taking shape. But it's early days. There's still time to make AI a competitive advantage. ♦

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