








How CEOs can tap AI's full potential

Successfully augmenting human expertise with artificial intelligence and other smart technologies starts with the person at the top

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Introduction

In April 2019, Stanley Black & Decker CEO James Loree presided over the opening of a 23,000-square-foot advanced manufacturing centre and innovation incubator in Hartford, Connecticut, called 'Manufactory 4.0.' The facility pulls data streams from sensors embedded in manufacturing equipment across all of the company's plants, allowing managers to pinpoint ways to increase efficiency.¹

The work taking place at the Manufactory is a significant step towards a future in which everything is digitally connected and people are empowered to make smarter decisions based on insights from artificial intelligence (AI) systems. In this future, humans and robots will work together and new production methods will be tested, tweaked and implemented in record time. More broadly, the new facility works towards a goal Loree established when he took office in 2016: to integrate technology and innovation into everything the company does, turning a 200-year-old organisation into, as the CEO puts it, "one of the world's great innovation companies."²

AI, automation and complementary technologies already play a significant role in how companies function. Fully 54% of executives say that AI solutions have increased productivity in their businesses, and that number is certain to grow in the coming years.³ But contrary to many press reports, increased productivity does not necessarily result in lost jobs. As business operations become smarter, with more AI embedded in them, these tools will be used less to replace people and more to augment them. Technology will help build human capabilities across a range of roles, functions and business units. For example, a chatbot can elevate a customer service request to a human agent to better serve the customer, an AI system can help product designers focus on the creative process by suggesting materials to use on the basis of certain parameters, and an assembly-line worker can use robotic arms to manipulate materials too heavy for a person to lift.

Combining human and machine capabilities raises the stakes for CEOs. They must understand the interactions between people and technology and create a strategy for how the two can come together to change the way work gets done, in large part by giving people the tools and training they need to change the way they work — and convincing people that they need to work in new ways.

The sheer scope of change — in terms of both talent and technology — can be overwhelming. But CEOs can begin to develop this vision by focusing on five areas: understanding the full range of potential applications, clearly defining a vision for your company's AI-enabled future, establishing a process to deploy AI, preparing your people to work differently and deciding where you stand on the ethics of automation and AI.

1 Dan Haar, "[Pioneering Revolution No. 4, Stanley Connects Its Universe](#)," *CT Post*, Apr. 4, 2019.

2 "[How Stanley Black & Decker's CEO turned the toolmaker into a total powerhouse](#)," *CNBC*, Oct. 25, 2017.

3 *PwC Consumer Intelligence Series: Bot.me*, 2017.

1

Understand the full range of potential applications

AI is no longer an emerging technology; it is an essential asset. Accordingly, the first step for you as CEO is to educate yourself on the art of the possible, by understanding how these technologies are likely to disrupt, and improve, critical aspects of your business. CEOs are at different levels of maturity — some are in the early stages of experimentation, others have already launched successful pilots and now want to scale up their efforts, and still others have grown up with AI and are now looking for the next frontier of innovation. Regardless of your starting point, you don't need a PhD in the subject, more like a working knowledge of the full range of potential applications and the different development paths (such as capabilities built in-house, partnerships, acquisitions and licensing). It also helps if you can cultivate a growth mind-set, which encourages lifelong learning and intellectual elasticity.⁴

There should be a shared, base-level understanding among your executive team — and your board of directors — about what AI and related technologies are capable of and how they can be integrated throughout the business. Part of this includes bringing in diverse perspectives and people who will ask lots of questions and even try to poke holes in assumptions about where and why AI should be applied.

Our Digital IQ survey consistently shows that a CEO's digital acumen correlates with the company's financial performance. Some 54% of top financial performers say their leadership is digitally savvy and helps the workforce think in a new way, compared with 41% of others.⁵ In the most recent edition of the survey, respondents self-selected into four groups, the most digitally savvy of which are the 'redefiners.' Executives in this group expect their digital strategy to fundamentally change the way their company does business, and nearly two-thirds of them embrace the most comprehensive and advanced definition of digital.⁶

⁴ Stuart R. Levine, "[Outperform with a Growth Mindset Culture](#)," *Forbes*, Feb. 26, 2019.

⁵ [PwC Digital IQ 2018](#).

⁶ [PwC Digital IQ 2018](#).

Loree at Stanley Black & Decker clearly understands how such technologies as AI, robotics and the industrial Internet of Things (IIOT) can improve productivity and spur innovation. Even before opening the Manufactory, the company had established a digital accelerator in Atlanta focused on integrating AI, augmented and virtual reality, and the IIoT across its array of business units. This was no small task for a 200-year-old manufacturer with US\$14bn in annual sales, but Loree is driving digitisation from the top down, empowering the people who run the Georgia digital accelerator and Connecticut Manufactory to work directly with business units in order to come up with technology-based solutions to a range of problems.⁷

Similarly, Royal Dutch Shell is applying AI in a variety of ways to help meet the mounting demands of a transitioning energy market. In one application, Shell uses a form of machine learning that is partially supervised by humans to control drilling equipment so it both is more precise and experiences less wear and tear. Shell data scientists are employing reinforcement learning, a type of machine learning in which the AI system is trained to think and make decisions. An algorithm that has been trained using data from historical drilling records combined with real-time data from sensors in the drill bit lets the AI system automatically interpret geological data, allowing the human operators, trained geologists, to make adjustments as needed to drill faster and more effectively. This frees up the geologists to oversee more wells or solve other problems.⁸



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⁷ "Robert Coop, Stanley Black & Decker — Optimizing Manufacturing with Driverless AI," video recorded at H2O World San Francisco, Feb. 6, 2019.

⁸ "Shell Announces Plans to Deploy AI Applications at Scale," *Wall Street Journal*, Sept. 20, 2018.

2

Clearly define a vision for your organisation's AI-enabled future

Next, you as the CEO need to define a vision for the ways automation and AI will drive the company's business strategy. A key issue here is the scope and ambition of that vision — how broadly and how fast the organisation should implement these technologies. Will it be an AI pioneer or merely a fast follower in its industry? Equally important, you need to identify specific business problems or challenges and determine where AI can help. The hype surrounding some emerging applications of AI can be so overwhelming that companies are tempted to chase after them, launching pilot after pilot without a clear approach for scaling up successes or tying initiatives to broader strategic goals.

The vision could include using AI to boost efficiency, automate processes, create new products and services, or improve the customer experience. For example, two recent entrants in the consumer insurance market, Screenshot and Lemonade, are speeding up the process by which claims are processed with apps powered by machine learning algorithms. Lemonade, a startup that sells renters' insurance, uses an algorithm to quickly search for signs of fraud by scanning photos of property damage that customers submit via a mobile app. This step helps speed up the claims process for policyholders and reduces the company's risk exposure. And Screenshot, which licenses its app to auto insurers, can assess car damage claims in less than three hours using photos customers add to claims via an app. That allows insurers to close most claims in less than three days, compared with the typical analogue claim processing time of 30 days.⁹

In other cases, AI will be used primarily to enhance or amplify experts' knowledge. At the Dana-Farber Cancer Institute in Boston, all patients have the option to have their DNA sequenced so doctors can use the information to improve their treatment plans. CEO Laurie Glimcher says Dana-Farber researchers are also exploring the use of machine learning to better analyse tumour samples from biopsies.¹⁰

9 "Startups Show Car and Home Insurers They Need to Get Smarter," *Wall Street Journal*, May 6, 2019.

10 "CEOs in Health Care Discuss Challenges of Working with Artificial Intelligence," *Wall Street Journal*, May 1, 2019.



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3

Establish a process to deploy AI

CEOs typically aren't directly involved in deploying AI and other advanced technologies. But it's clearly their mandate to set up a process by which that happens. That often means putting a team in place — typically led by the CIO or CTO but including a diverse range of expertise and perspectives, from data scientists and tech experts to operational managers and commercial leads. In some cases they bring in third parties as well, from sources such as academia or AI-related startups. CEOs should sync with their tech leads to develop a clear picture of the various AI development paths, including developing solutions in-house, acquiring AI companies, licensing AI solutions and forging partnerships.

Next, you need to establish the right decision-making authority, governance and other parameters that allow technology to be embedded across business units and functions. The goal is to apply AI as broadly as it makes sense for your organisation — beyond merely solving a specific technical problem.

At Siemens USA, which employs 50,000 people and has US\$23bn in revenue, CEO Barbara Humpton has a hand in all of the company's AI initiatives. She does not directly supervise them, but she has set the company's AI agenda and spends a lot of time in media interviews and industry panels sharing Siemens USA's approach, which ties in with that of the parent company based in Germany. Siemens USA has a venture capital arm based in Palo Alto, Calif., that, when it invests in technology companies, buys a large enough stake in them so it can use its considerable resources to help those companies grow or otherwise increase their chances of success. Siemens USA also has an annual R&D budget of US\$1.3bn and runs its R&D unit using a collaborative rather than hierarchical management approach, which helps increase the company's agility.¹¹

¹¹ Michael Kringsman, "[CEO view: Digital transformation at Siemens USA](#)," ZDNet, Mar. 18, 2019.

A key aspect of making sure you have the right processes and teams in place is thinking about data in the right ways. You should start by identifying where you want to create value, then look at what data assets you already have and which ones you need to make that happen. Without the ability to extract data from various systems — or to ensure that the right people have access to the right data when they need it — AI cannot possibly deliver targeted benefits. It's a clear imperative: 58% of executives said that their top AI-related data priority for 2019 is to integrate AI and analytics systems to gain business insights.¹² It's crucial to have access to data from all the key business functions: sales, marketing, finance, procurement, R&D and so on. Likewise, if CEOs can emphasise the message that data-driven decision making is (or will soon become) the new normal, functional leaders will take up the cause.



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¹² [2019 AI Predictions](#), PwC, 2018.

4

Prepare your people to work differently

Technology — and AI in particular — changes the way people work, typically by automating mundane, repetitive tasks such as data entry or generating reports, freeing the employees who used to perform those tasks to create value in new ways. In the United States, AT&T has rolled out 1,000 software bots to handle rote tasks in such functions as customer service and finance, allowing some employees to shift to more knowledge-based work and high-level analysis. Steve Stine, AT&T's chief data officer, says the software robots and other data optimisation efforts, advanced analytics and artificial intelligence have helped generate hundreds of millions of dollars' worth of business value in recent years.¹³

Yet a limiting factor on achieving AI-driven results is that many companies simply don't have enough people with the right skills. In PwC's latest CEO Survey, 55% reported that a lack of key skills is inhibiting their ability to innovate.¹⁴ As CEO, it's up to you to communicate through the ranks of middle management that training and skills development are going to become far more important. Some people will see their jobs change dramatically because of AI. But that's an opportunity for many to learn critical new skills. CEOs can foster a culture of adaptability and lifelong learning that will be crucial to reaping the benefits of AI and related technologies.

Siemens USA's Humpton feels strongly that businesses should take responsibility for upskilling and retraining their workforce. Siemens USA spends US\$50m each year to reskill and develop its 50,000 employees, and the global organisation spends US\$600m on training annually.¹⁵ Meanwhile, media conglomerate Bertelsmann recently launched a global education initiative to strengthen its employees' technology skills. The company has committed to investing several million euros to fund as many as 50,000 scholarships with the online learning platform Udacity on topics such as cloud applications, data analytics and AI.¹⁶

¹³ ["AT&T's 1,000 Software Robots Are Doing Boring, Repetitive Work for Humans," Wall Street Journal, Feb. 5, 2018.](#)

¹⁴ [PwC's 22nd Annual Global CEO Survey, 2019.](#)

¹⁵ ["The head of Siemens USA explains why it's making open-source training programs available across industries, as it looks to benefit from a new age of automation," Business Insider, Mar. 20, 2019.](#)

¹⁶ ["Bertelsmann Announces 50,000 New Udacity Scholarships in Areas of Cloud, Data, and AI," Udacity, Apr. 26, 2019.](#)

Any initiatives to upskill and reskill people need to be focused on the right areas. In our Digital IQ survey, 62% of redefiners (the most digitally savvy group of respondents) said they've changed the way they recruit and train with the goal of creating a more digitally savvy workforce,¹⁷ but just 28% said that investment was paying off. What may be missing in those companies is the goal to 'democratise AI,' that is, making sure the workforce is AI savvy enough to actively participate in the conversation regarding what can be automated or where AI can be applied.

CEOs also need to harness employees' intrinsic motivation to learn. Just as you cultivate your own growth mind-set, you should encourage employees at all levels to do the same, while communicating clearly throughout the organisation how integrating certain technologies may impact people's jobs so they understand how they can contribute to the company's success (as well as their own).

Of course, AI and other technologies can themselves be used to train people more effectively in new ways of working. Swiss industrial power company ABB, for example, uses a variety of methods to train new employees or retrain current ones, including virtual and augmented reality, according to Guido Jouret, ABB's chief digital officer.¹⁸



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¹⁷ PwC Digital IQ 2018.

¹⁸ "Digital transformation and the industrial internet of things at energy giant ABB," ZDNet, Feb. 25, 2019.

5

Decide where you stand on the ethics of automation and AI

Compounding the challenge of leading in an era that combines human and machine intelligence is the issue of responsible AI. Because algorithms 'learn' from historical data, some companies have launched bots that simply replicate ethnic stereotypes and bias-filled decisions made by humans. The companies did not solve these problems but merely put them on autopilot. There are broader considerations as well, about the possible impact of widespread commercial applications of automation and AI on society at large.

To address these issues, companies should build processes and train teams to look for biases in data and machine learning models. Companies must also integrate risk mitigation and ethical concerns into AI algorithms and data sets from the start, along with considering other workforce issues and the greater good. Siemens AG's CEO, Joe Kaeser, recently shot back at investors who questioned the company's US\$600m investment in employee training, saying that if shareholders did not approve, they could put their money elsewhere.¹⁹

Involving your board of directors is important here, too, because unintended consequences from AI could pose compliance risks and potential damage to your brand's reputation. Boards will want to hear from management how it is addressing those risks and how the company is ensuring that biases do not affect AI decisions. They'll want to understand whether the company has established practices and put controls in place to minimise any reputational or other risks.

In addition to addressing concerns of ethics related to fairness and negative bias, responsible AI engenders trust because it is explainable — that is, not only can people using the AI systems, and those who are impacted by the systems, understand how the AI arrives at decisions or actions, but the organisation employing AI has also made a conscious effort to communicate how systems work and solicit feedback about whether they're communicating effectively. Implementing clear policies on the data privacy, decision rights and transparency of AI systems is key.

¹⁹ ["The head of Siemens USA explains why it's making open-source training programs available across industries, as it looks to benefit from a new age of automation," Business Insider, Mar. 20, 2019.](#)



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Conclusion

The CEO's job is never easy, and the confluence of changes in human capital and technology will make it much harder. Leadership entails embracing certain paradoxes — being bold when exploring AI's potential, yet humble enough to know when you don't have all the information; decisive about where AI fits into your business strategy, yet able to handle uncertainty about how some initiatives will play out; being open to partnerships, while protecting your own intellectual property if needed.

The biggest of these paradoxes is the requirement that CEOs continue to focus on people — a company's most valuable resource — while also implementing AI and other technologies, and understanding the interface between the two. It's a tough challenge, but the CEOs who can rise to it will equip their companies to accomplish more than they ever have before.



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