What is Your Artificial Intelligence Strategy?

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■ **ARTIFICIAL INTELLIGENCE (AI)** is driving rapid change across all industries.[1,2] The rise of AI raises new questions about AI strategy. How should firms formulate and execute their digital or information technology (IT) strategies and business strategies embracing opportunities that AI present? Should firms formulate a separate AI strategy, or should AI strategy be part of their overarching digital strategy? In many ways, these questions are similar to those in the past when newer technologies came onto the horizon.[3–6]

In this article, we outline some fundamentals of strategy and discuss how organizations can harness AI for their advantage, illustrated with a few examples of business applications of AI. Then, we discuss how AI strategy relates to an overall digital or IT strategy and how to develop a digital strategy that also encompasses and supports the enterprise's AI strategy. Finally, we examine strategy implications for corporate leaders, IT professionals, and researchers.

WHAT IS A STRATEGY?

Broadly speaking, strategy answers questions, such as where to compete and how to

> CEOs, CIOs, and other top management team members must reimagine their digital and business strategies at the corporate, competitive, and functional levels, leveraging opportunities that AI present, which vary across industries.

compete to gain competitive advantage. A practical and tangible way of defining strategy or competitive advantage is to create and capture economic value (EV), where EV is the difference between the customer's willingness to pay (WTP) and a supplier's opportunity cost (SOC). Since WTP and SOC are not easily measurable, a practical way is to view competitive advantage as simply the difference between the price of products and services that a firm offers and their cost. In terms of publicly reported financial numbers, competitive advantage, or EV, is approximately the profit, and it is influenced by a firm's revenues and total costs.

HOW AI INFLUENCES STRATEGY

AI can influence competitive advantage of a business through its impact on price and cost or on revenues and total costs. AI can affect

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revenues by enhancing sales capitalizing on existing products, customers, and channels by creating new products and channels and targeting new customers, as well as by reducing prices through cost reduction or cost avoidance. Viewing strategy as the creation or capture of economic value, firms can add value in a few different ways: They can either increase price or willingness to pay without affecting costs, decrease costs without affecting price or willingness to pay, or increase the difference between price and cost by changing both at the same time in such a way that a price increase is more than a cost increase or a cost decrease is more than a price decrease. AI can help in all these choices.

ADROIT Framework

An easy way to identify the role of AI in creating competitive advantage is to parse the value created by AI into six components, characterized by the acronym ADROIT: first, adding revenue or volume; second, differentiating or increasing willingness-to-pay; third, reducing costs; fourth, optimizing risks; fifth, innovating by generating and deploying knowledge and other capabilities; and sixth, transforming business models, business priorities, and business processes.

ADROIT captures the role of AI in creating competitive advantage through five key drivers of the sustainable economic value: volume, margins (achieved through differentiating, reducing costs, or improving industry attractiveness), optimizing uncertainty or risks in a competitive environment, improving resources and capabilities of an organization, and strategic continuous transformation to shape and respond to a changing competitive landscape.

Next, let us examine how AI can be harnessed to influence various dimensions of the ADROIT framework.

Adding Revenue

AI can help add revenue through inorganic means, such as acquiring other companies that are leaders in the AI space or through organic means that may involve increasing sales to existing or new customers through existing or new channels by selling existing or new products. Growth can also be driven by pricing or producing more competitively and dynamically and by

targeting unserved or underserved markets using AI. For example, the Los Angeles-based start-up Tala provides microloans to consumers and small business owners in emerging markets, such as Tanzania, the Philippines, Mexico, and India, that are often not on the radar of traditional banks. Tala evaluates borrower risk by using machine learning algorithms to process cell phone data, looking at loan applicants' habits, app usage, personal identifiers, behavioral data, such as how quickly prospective borrowers fill out a loan application, and other relevant information.[7]

Differentiation

AI can help differentiate or increase willingness-to-pay by competing on nonprice attributes, such as perceived quality or convenience that often reflects in customer satisfaction. For example, AI can help increase WTP by anticipating latent needs of customers and serving them, such as Amazon delivering goods to your doorstep even before you order them and letting you return the ones that you do not want. Amazon's well-known recommender system proactively informs its customers of new products based on their interest and helps people discover products that they might not have found on their own.[8] The research suggests that the perceived quality is often a stronger driver of customer satisfaction and WTP than the perceived value,[9] and firms can use AI to improve customer knowledge and perceived quality for the improved customer satisfaction.

Reducing Costs

AI can help reduce overall costs of a company by eliminating waste through better analytics. AI-based predictive analytics can reduce costs of poor quality of products and services that may result in the return of goods sold or customer defection. Elevator companies, such as Kone, Schindler, and Thyssenkrupp, are using AI and Internet of Things (IoT), such as sensors that measure vibration, lighting, noise, speed, doors opening, and temperature to proactively predict maintenance requirements of elevators, thus reducing significantly costs incurred by firms due to faults and breakdowns.[10] AI also helps offer better transparency, improved safety, and peace of mind for the clients and elevator users. Oil and

gas companies also use advanced AI-empowered analytics for predictive maintenance.

Optimizing Risks

AI can help reduce or optimize risks through predictive analytics, proactive maintenance, self-repair, and related measures. Managers must try to avoid or reduce "downside risks" of not investing in AI by engaging in counterfactual reasoning. For instance, even if the net present value (NPV) of investing in an AI project is not positive, that by itself does not mean that managers should not invest in the AI projects. A counterfactual reasoning may show that they have more to lose by not investing in AI if their competitors make such AI investments. NPV calculations often do not consider the risks of not investing, such as loss of market share or the ability to attract new customer segments. Managers should also consider the effect of AI investments on intangibles, such as customer satisfaction, that can in turn help to reduce downside risk.

One way to address risk in managing AI projects is to think of them as real options: Managers can prioritize parts of the AI projects into must-do, may-do probably later, and never-do components. Indeed, some projects may belong to the "never-do" category based on ethical or other societal considerations, even if they bring financial or other kinds of benefits. In other words, firms must adopt "responsible AI" policy and satisfactorily address new kinds of risks and concerns[11] that can arise in the use of AI, such as those relating to potential bias[12] (such as in recruitment decisions based on ethnicity or gender), ethics[13] (should AI applications be used for defense purposes?), data privacy (do customers prefer more personalized services at the cost of their every-day actions being observed for patterns?) and transparency regarding the use of AI (for example, how the AI algorithm works or arrives at a recommendation) to determine employment, or healthcare or housing access.

There is also a role here for governments and policymakers to develop governance mechanisms and regulations for responsible use of AI across many domains that touch human lives.[14] Governments have a role in reducing risks that AI may create by bringing about significant changes in the nature of jobs and skill sets; Herbert Simon, a Nobel Prize winner and "the founding father of AI," even predicted the potential extinction of the computer programming occupation by 1985.[15]

Innovating

AI can help firms pursue AI-embodied or AI-enabled innovations by making R&D more effective and scalable, as well as by using innovation from outside the firm. For example, Aravind Eye Hospital in Madurai (in India) is collaborating with Google on developing an AI-based algorithm to screen diabetic retinopathy and detect the early onset of blindness. The hospital expects that eventually people could get a preliminary eye check-up done using an application on their smartphones.[16] For countries like India, where patient volume in hospitals is often high and patients spend time and resources in travelling to a hospital and waiting for their turn, such innovations may not only make the diagnosis quicker but also early enough to prevent blindness.

Transforming

AI can help transform business models, business priorities, and business processes. Electricity distribution companies have come up with new business models that employ demand-response mechanisms to help them balance energy supply and demand and, at the same time, democratize supply through alternative energy sources.[17] Some heavy commercial vehicle manufacturers in India are seeking to provide bus-as-a-service to the state-owned transport companies with the aim of using IoT and AI-based applications that not only track and trace and provide predictive maintenance but also help identify profitable routes and incentivize driver performance, transforming the business models of automobile companies.

Business model transformations require that managers calibrate their response to the triggers that are driving the transformation, protect their current revenue streams to the extent possible while finding ways to develop or grow new revenue streams, and develop capabilities for dealing with change and transformation without being blinded by the rush to outsource key capabilities that may be necessary for the competitive advantage in the future.

AI APPLICATIONS ACROSS INDUSTRIES

Some firms are already harnessing the power of AI by applying it to several strategic initiatives across many verticals, such as retail, manufacturing, commerce, finance and banking, transportation, telecommunications, sports, and entertainment.

- Unilever has successfully integrated AI into multiple aspects of its business, such as demand forecasts, market analytics, and streamlining hiring and onboarding, capitalizing on its vast amount of data collected from both internal and external sources.
- Amazon uses machine learning algorithms to optimize inventory management and delivery. With a robust AI-empowered system in place, Amazon is able to successfully manage its delivery services.
- Experian, a credit rating agency, is using AI to crunch through its masses of data and make quicker, smarter decisions on credit scores.
- American Express is using AI to detect fraudulent transactions in pretty much real time. Interestingly, some financial firms are working to identify potential fraud by analyzing customers' behavioral data, such as how customers hold their phones, how fast they type, and other information about mobile interactions. The Royal Bank of Scotland is testing the technology for use in retail banking, but the high number of individual customers presents challenges.
- Dominion Bank Group, based in Toronto, not only uses AI to make better decisions but also deployed an in-house built software tool that explains to its business executives how its AI systems arrive at conclusions.
- Volvo is using AI technology to predict part failure and provide more accurate information on when a vehicle needs servicing.
- SAP offers a partner company's AI software to help customers comply with data-privacy regulations, including the sweeping California law, and navigate regulations, such as CCPA and GDPR.
- Pinterest has an AI-powered feature on its website and mobile app that can identify images of some items, provide a link to

retailers that sell those items, and show photos of similar items that can be purchased.
- The U.S. Tennis Association used IBM Watson AI in the 2019 US Open tennis tournament to defend its computers against security threats, to produce tournament highlights, and to quantify and benchmark players' performance.
- Basketball players are using an AI program to learn how to execute a winning drive to the hoop. Trained with player movement data from the U.S. National Basketball Association, the program provides a simulation of how both offensive and defensive players would move during the play.

These examples illustrate the potential of AI and inspire executives and senior IT professionals to examine how they can capitalize on AI for their business advantage in the competitive market where AI is pervasive.

DEVELOPING A DIGITAL STRATEGY EMBRACING AI

To harness the power of AI for its competitive advantage in the AI age, every business needs a digital strategy that encompasses and supports its AI strategy. Doing so will require that managers synchronize AI strategy with competitive strategy. A competitive strategy of differentiation and a competitive strategy of cost leadership will have different implications for AI strategy. Focusing on differentiation may require emphasizing revenue growth in AI strategy and in investments in CRM and personalization systems. In contrast, focusing on cost leadership may involve deployment of robust AI systems that provide end-to-end visibility of costs and promote efficient execution of the business processes.

How should managers determine the choice of their AI and related IT strategies? Earlier, we discussed three strategic choices or pathways: first, focus primarily on reducing costs, second, focus primarily on increasing revenues, and third, focus on both cost reduction and revenue growth simultaneously; in other words, follow an ambidextrous strategy. The choice may depend on the firm's strategy and how much it wants to invest in IT/AI. An academic research

implies that firms may be better off using ambidextrous IT/AI strategies that focus on both revenues and costs at the same time if they are willing to invest more money on IT/AI than their competitors spend.[18]

How should firms begin to move toward IT-business strategy synchronization? An increasing involvement of IT professionals in the strategy formulation and a greater involvement of business executives in the IT governance and managing IT projects are keys to achieving IT-strategy synchronization. Fortunately, some leading companies are moving in this direction, giving their CIOs responsibility for managing line businesses. Some other firms are providing exposure to IT projects and the IT function to their promising executives as part of their grooming, or they are picking those who have managed their IT function well and have broader business exposure and interest, as their CEO.

How should managers and boards approach AI strategy, given the above discussion? First, managers must understand the duality inherent in AI and question their conventional strategy concepts, which focus on tradeoffs without recognizing that AI can, at times, help overcome the tradeoffs altogether. For example, a survey of CEOs by *Fortune* magazine noted that 60% of CEOs were using AI to "improve efficiency/reduce cost," whereas 22% were using AI to "create new products/services."[19] Managers should realize that they need not pursue these binary choices. AI can help firms pursue both revenue growth and cost reduction, or higher quality and lower costs—combinations that a purist approach to conventional strategy might not consider, making AI a means to operationalize blue-ocean strategies.

Second, in terms of the role of corporate boards in discharging their responsibility, they have the responsibility to ask questions about the AI posture of the company and avoid acts of omission, such as moving too late (consider, for example, Blockbuster, which failed to react to Netflix). The boards should demand the information necessary to properly understand the companies' risks arising out of AI strategies of their competitors. Relying only on CEO's personal view can be risky. For example, consider the remark by Jeff Bezos in a 2006 interview: "I

guarantee that five years from now, no one will want to be a social networking company," a prediction that proved to be way off.

CONCLUSION

AI is poised to bring significant transformational changes to how firms compete, just as previous advances in IT, such as the Internet, social media, cloud computing, and social networking did and changed how firms craft and execute strategies. Those organizations that do not capitalize on the transformative power of AI risk being left behind. Instead of following a piecemeal approach to embracing AI that is disconnected with their overall IT strategy, firms are better off crafting their AI strategy as part of their overall IT strategy, which includes prioritizing IT applications, managing IT resources, designing data governance, ensuring security and privacy, and complying with government regulations, if any. CEOs, CIOs, and other top management team members must reimagine their digital and business strategies at the corporate, competitive, and functional levels, leveraging opportunities that the AI presents, which often vary across industries. A thoughtful approach, even if it takes longer to develop, is often more fruitful than putting together a strategy in a hurry without due consideration. The winners will be firms where business and IT leaders collaborate, rethink, and innovate on how they create value using AI for the business and its customers and on how they apportion some reasonable part of that value among their key stakeholders.

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