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AI in the Technology Industry

How the Need for Competitive Advantage Is Driving AI Investment

Internal Audit, Risk, Business & Technology Consulting

Introduction

The technology industry is all about developing and commercializing innovative ideas. That is why technology and artificial intelligence (AI) are a perfect match — an Edison-meets-the-light-bulb moment when companies can rethink and transform how they operate and succeed in the marketplace.

It's clear that tech companies already recognize the opportunities that AI presents. They pioneered some of the AI innovations that many of us use every day, like virtual assistants from Amazon and Apple (Alexa and Siri, respectively) and the navigation systems in automobiles. According to a 2018 Protiviti study, technology companies expect value from AI investments to soar in as little as two years.[1]

But few tech companies are realizing a significant return on that investment. AI is just beginning to produce the operational efficiencies that tech leaders want and expect. And it is not yet widely used to help drive revenue and grow the business.

This white paper examines the issues that technology companies must navigate as they continue to invest in AI. Among the top concerns for companies implementing AI are how to derive business value from the technology and how to attract and develop the specialized talent needed to support AI programs as they evolve and mature.[2] At the same time, organizations must address some relatively new and highly complex issues that have put the tech industry in the media spotlight, including data privacy and business ethics.

"While many companies, including a host of technology firms, are still at the starting gate with AI, or only in the early stages of development, that will change soon. Our research suggests we will see a rapid acceleration of AI investment and advancement within the next two years."

– Gordon Tucker, Protiviti Global Technology Industry Practice Leader

[1] *Competing in the Cognitive Age*, Protiviti, 2019: www.protiviti.com/sites/default/files/united_states/insights/ai-ml-global-study-protiviti.pdf.

[2] Ibid.

Key Takeaways

01 General managers are skeptical about AI, but technology executives are not: Only 14% of chief operating officers and 8% of chief executive officers (CEOs) see advanced AI as considerably or very important to the future of their businesses, while 57% of chief technology officers and 46% of chief data officers feel this way.[3]

02 Leadership must understand exactly how AI will produce shareholder value. To create compelling pilots and proofs of concept, companies should address projects that are not easily solved by other analytical approaches.

03 Sourcing AI talent will be one of the biggest challenges for companies, so it is advantageous to create a talent development plan for AI initiatives early. Nearly one-third (31%) of respondents to our survey said the lack of AI talent and skills was a top obstacle to AI adoption.[4]

04 Tech companies should consider the risks and rewards of AI development, practicing ethical AI and taking a balanced approach that prioritizes good governance and responsibility to the larger community.

The extent to which technology companies can manage these issues and drive change constructively within their organizations will determine how quickly they can unleash the full power of this transformational technology.

[3] Ibid., page 29.

[4] Ibid., page 25.

AI Is an Investment Priority

In 2019, every major global industry is making a serious commitment to AI, investing in systems to automate and optimize operations and improve the customer experience. According to Protiviti's *Competing in the Cognitive Age* report, companies spent, on average, $36 million on AI in 2017,[5] and their spending on AI systems is expected to increase by 8% by 2020. Not surprisingly, tech companies spent even more on AI efforts — $44 million, on average — and that number is expected to increase 11% by 2020.[6]

> *"Because tech firms are at the forefront of shaping this rapidly evolving area of technology, they also have a prime opportunity to set the standard for ethical AI. And it's likely many firms will be even more motivated to seize that opportunity once they recognize the connection between ethical AI practices and protecting their return on investment in AI technologies."*
>
> – Gordon Tucker, Protiviti Global Technology Industry Practice Leader

To achieve the operational efficiencies and return on investment (ROI) that tech leaders want and expect, these organizations must address several challenges early or risk losing the competitive advantage that AI brings.

Tech leaders are inherently drawn to emerging technologies — it's in their DNA. They also have had some early success and are motivated to keep the momentum going:

- In 2016, Microsoft established the Microsoft AI and Research Group[7] as a fourth engineering division at the company, with more than 5,000 computer scientists and engineers tasked with driving AI into the company's products. One year later, that team reportedly had grown to almost 8,000 members.[8]
- Intel has designed and launched a family of processors specifically for the computational demands of AI.[9]
- Chinese tech company Baidu is investing heavily in AI,[10] building image-recognition technology, advancing autonomous driving, launching digital assistants and developing augmented reality tools.

AI has become an integral part of digital strategy and is already used in a variety of applications. This is certain to continue and grow as companies prove its effectiveness.

[5] Ibid., page 11.

[6] Ibid., page 11.

[7] "Microsoft expands artificial intelligence (AI) efforts with creation of new Microsoft AI and Research Group," press release, Microsoft, September 29, 2016: https://news.microsoft.com/2016/09/29/microsoft-expands-artificial-intelligence-ai-efforts-with-creation-of-new-microsoft-ai-and-research-group/.

[8] "One year later, Microsoft AI and Research grows to 8K people in massive bet on artificial intelligence," Geekwire, September 22, 2017: www.geekwire.com/2017/one-year-later-microsoft-ai-research-grows-8k-people-massive-bet-artificial-intelligence/.

[9] "Intel Nervana Neural Network Processors (NNP) Redefine AI Silicon," Intel blog, October 17, 2017: www.intel.ai/intel-nervana-neural-network-processors-nnp-redefine-ai-silicon/#gs.mg3qa7.

[10] "How Chinese Internet Giant Baidu Uses Artificial Intelligence and Machine Learning," *Forbes*, July 6, 2018: www.forbes.com/sites/bernardmarr/2018/07/06/how-chinese-internet-giant-baidu-uses-artificial-intelligence-and-machine-learning/#2c88ce3e2d55.

AI's Strong and Deepening Impact

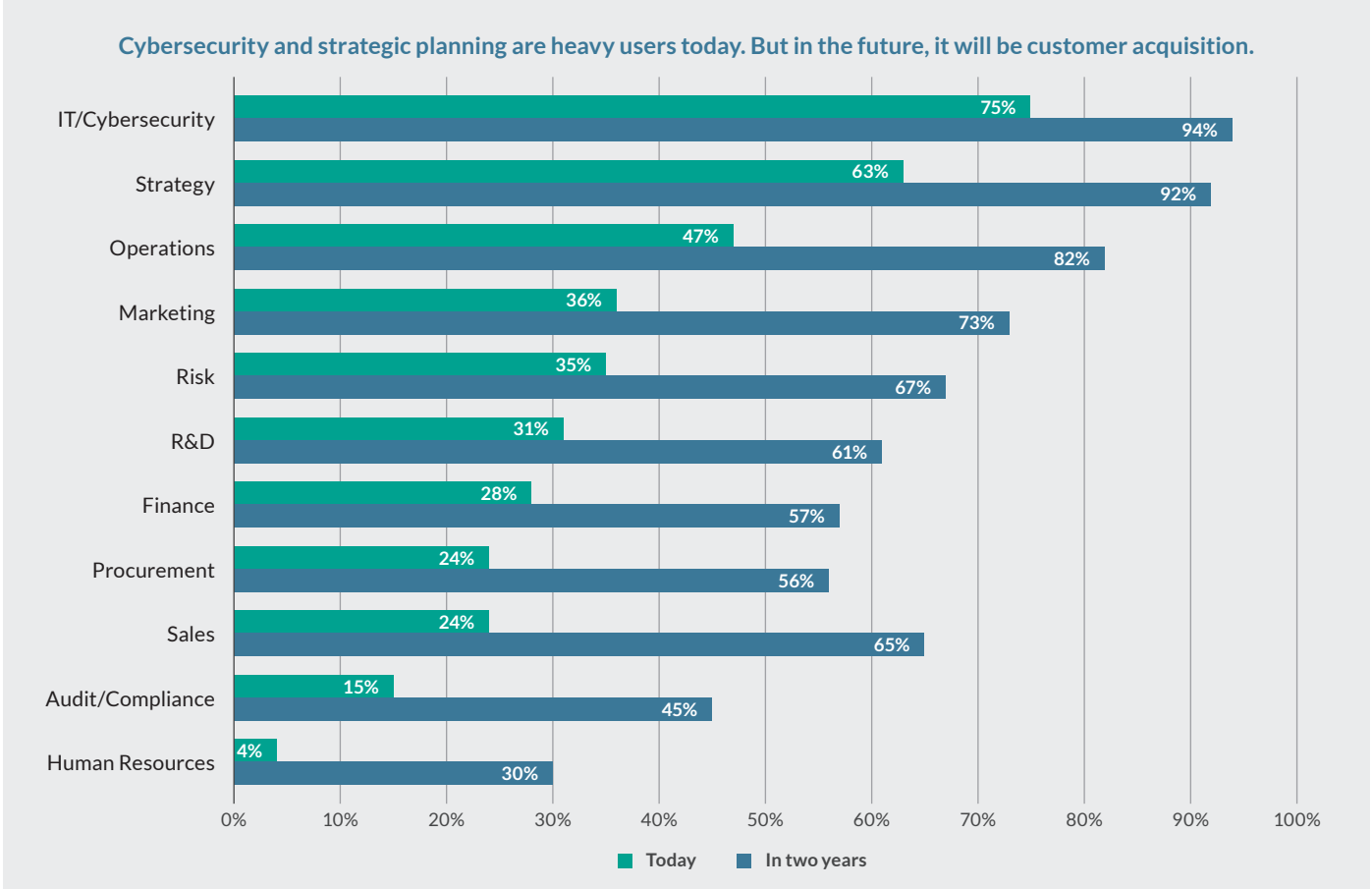
AI is already making an impact on numerous business functions and processes in tech. Protiviti's research shows that the cybersecurity function is the heaviest user,[11] with 75% of companies utilizing AI to spot trends and outliers in company data to protect against cyber threats.

Algorithms in security tools can detect unusual patterns in encrypted web traffic, cloud and Internet of Things (IoT) environments automatically. A recent Cisco study notes that 66% of chief information security officers now rely on AI to reduce the level of effort required to secure their organizations.[12]

Increasingly, AI is used in strategy and planning as well, which is not surprising. AI and machine learning can extract meaningful patterns and trends from large datasets, revealing the total available market for a particular product or service, and enabling marketers to gain valuable customer insights. By analyzing hundreds of data points about their users, marketers can leverage AI to create more personalized experiences.

Where advanced AI is having the greatest impact

Percentage of organizations reporting moderate or significant positive impact



[11] *Competing in the Cognitive Age*, page 20.

[12] *Anticipating the Unknowns: Chief Information Security Officer (CISO) Benchmark Study*, Cisco: https://ebooks.cisco.com/story/anticipating-unknowns#!/page/4/1.

Optimizing Operations

Almost half the companies surveyed for Protiviti's *Competing in the Cognitive Age* report said they are using AI to streamline operational processes, aiming to drive productivity and cost savings.[13] It is now common to see technology companies using some combination of robotic process automation (RPA) and AI to replace repetitive, manual activities. Amazon's innovative use of AI in its warehouse operations is one of the best-known examples. Amazon has about 100,000 mobile robots in its fulfillment centers. When a worker needs merchandise to pack a box for a customer, that worker dispatches a robot to retrieve it.[14]

Making the Most of Limited Talent Resources

In AI, as in most technology-based disciplines, one of the biggest impediments to adoption and success is the limited supply of specialized talent in the marketplace. The U.S. labor market is near full employment, and the unemployment rate for many key roles is 2% or lower.[15] Many of those high-demand roles are technology specialists like data scientists and software developers.

Unlike in most other industries, the talent crunch does not appear to be holding back technology businesses. To secure — or at least "borrow" — talent, many tech companies are partnering with consulting firms and universities or outsourcing some of their AI work to outside specialist companies and individuals. Organizations are also developing their own AI talent in-house, tapping into a talent pool that is already trained in at least one technology discipline. This is a sound strategic approach that alleviates some of the pressure to find talent elsewhere while helping companies retain the skilled people they already have in the organization. A strong training program can also attract new recruits from outside the organization, giving companies a long-term competitive edge in the talent marketplace.

For those AI professionals already in-house, tech companies are getting the most value by situating these individuals in business units or divisions where they can collaborate with the teams that will be using the technology.

In addition to bringing talent in, companies are partnering with managed services organizations that take ownership of certain lower-value functions and activities such as help desk management. Beyond overseeing the project itself, the third party manages onboarding and support of all project resources and provides reporting on progress and improvement. That allows companies to redeploy internal talent to more strategic activities, including AI initiatives.

[13] *Competing in the Cognitive Age*, page 20.

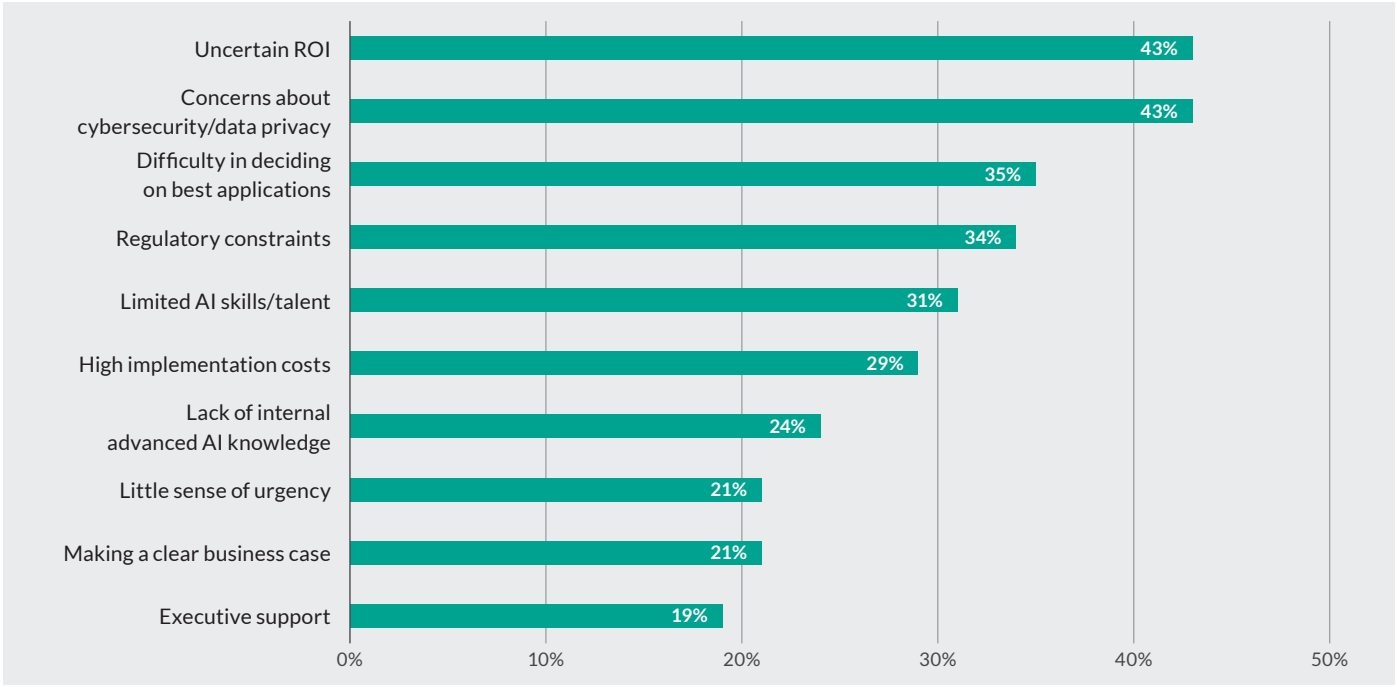
[14] "Amazon's Growing Robot Army Keeps Warehouses Humming," Bloomberg Environment, May 1, 2019: https://news.bloombergenvironment.com/safety/amazons-growing-robot-army-keeps-warehouses-humming.

[15] U.S. Department of Labor, Labor Force Statistics from the Current Population Survey: www.bls.gov/cps/.

Companies Must Solve the ROI Challenge

Technology companies are well-positioned to capitalize on the promise of AI. They are committed to investing in the technology, have an ambitious vision for the future and are confident they can develop the talent they will need. But the outlook, at least in the short term, is not clear and sunny, chiefly because leaders have a lingering and real concern about ROI.

- **ROI and concerns about cybersecurity/data privacy are tied as the biggest challenges**



"Uncertain ROI" is the top concern (along with "Concerns about cybersecurity/data privacy") among 43% of the respondents to Protiviti's survey, while executive support ranks at the bottom of their list of concerns.[16] That indicates that while senior leadership is not standing in the way of AI investment, they continue to have questions about what AI can deliver for their business. Executives may not fully understand what specific AI applications are needed and why the technology is relevant and valuable to their organization.

Right now, however, technology companies are optimistic. More than 75% expect their AI investments to create increased revenue, productivity, profitability and shareholder value for their business within two years.[17] That number far exceeds that of other industries surveyed for the report. But it is incumbent on chief technology and data leaders to deliver those results. Using AI, they can analyze a target customer's specific problems and needs and deliver a solution. Small-scale pilots can quickly demonstrate AI's effectiveness and model the ROI, opening the door to move beyond pilots and business unit-specific projects, utilizing AI more strategically across the entire enterprise.

[16] *Competing in the Cognitive Age*, page 25.

[17] Ibid., page 8.

Data Privacy Presents a Formidable Challenge

Data privacy is an issue for any company, but it may be an even bigger barrier for tech companies. Data is the lifeblood of AI, but growing concerns about privacy in the United States and Europe pose significant limits on companies' ability to collect and use data for their AI initiatives. In this regard, Chinese companies, such as WeChat, have a competitive advantage when it comes to user data collection.

There are stories in the media almost daily about the data privacy conundrum that tech companies face, especially platforms like Google and Facebook. Google CEO Sundar Pichai published an op-ed in *The New York Times,* writing, "I believe [privacy is] one of the most important topics of our time. … For us, that means privacy cannot be a luxury good offered only to people who can afford to buy premium products and services. Privacy must be equally available to everyone in the world."[18]

In the same article, Pichai called for new regulation: "We think the United States would benefit from adopting its own comprehensive privacy legislation and have urged Congress to pass a federal law. Ideally, privacy legislation would require all businesses to accept responsibility for the impact of their data processing in a way that creates consistent and universal protections for individuals and society as a whole."[19]

The AI policy landscape is still in its infancy. The European Union's General Data Protection Regulation (GDPR)[20] went live in May 2018, and the California Consumer Privacy Act (CCPA)[21] is coming in 2020. GDPR and CCPA have differences, but both give individuals the right to see and control how organizations collect and use their personal data and provide recourse should they suffer damages due to bias or cybersecurity breaches.

> *"The AI revolution that's now underway will change the course of business across all industries and turn data into the key driver of competitive advantage. But the data and privacy issues around AI present social implications, and hence, risk for businesses and their stakeholders."*
>
> – Madhumita Bhattacharyya, Protiviti Business Strategy and Advanced Analytics

Companies should consider taking a global approach to regulatory issues by aligning teams that are helping to shape policies in different jurisdictions and address compliance by applying best practices globally. Complying with GDPR, for example, will help organizations prepare for CCPA and other future regulations.

As companies harness data for advanced computing like AI and machine learning, they will, at the very least, need to govern their activities tightly. It's fair to ask whether these limitations — self-imposed or otherwise — will hold companies back competitively. If companies do not have the ability to utilize the data they are collecting fully, does it affect their ability to compete with companies in China and other jurisdictions that do not have the same limitations? Does that keep U.S. companies in a secondary position?

[18] "Google's Sundar Pichai: Privacy Should Not Be a Luxury Good," *The New York Times*, May 7, 2019: www.nytimes.com/2019/05/07/opinion/google-sundar-pichai-privacy.html?login=email&auth=login-email.

[19] Ibid.

[20] EU GDPR: https://eugdpr.org/.

[21] "California Consumer Privacy Act," by John Stephens, American Bar Association, July 2, 2019: www.americanbar.org/groups/business_law/publications/committee_newsletters/bcl/2019/201902/fa_9/.

The Ethics of AI

As companies adopt AI and broaden its application, there is rising concern among policymakers, researchers, customers and employees about the social implications of these technologies. How do we ensure they are not used to deceive or harm people? How do we make sure they help generate trust among users and the public?

Employees are some of the most outspoken stakeholders. As companies establish new AI policies and programs, activist employees are paying close attention. They will amplify their voice on social media for a wide range of concerns, including potential human rights violations, privacy issues and bias built into AI algorithms.

Others are concerned about so-called "dual-use" AI technologies, which have everyday commercial applications, like product recommendations when shopping online, as well as military applications, like identifying targets for drones.

Ethical questions arise in this unique moment in technological development where we are attempting to make machines think the way the human mind thinks, and we are developing machines that can perform activities that humans perform. It is clear we need ethical guidelines, and we need processes and controls to help businesses develop these systems in a constructive, positive way.

Accountability Standards Are Lacking

Today, most AI systems and related technologies are being put in place with few accountability mechanisms and little thought about their broader implications. There are no standard methods to measure and assess the social implications of AI, even as these systems are being integrated into society.

The European Commission has issued draft guidelines[22] as part of a pilot process, recommending a number of requirements that AI systems should meet to be deemed ethical and trustworthy, while some companies developing AI technology are creating their own guidelines. Google, for example, has developed corporate principles meant to ensure its systems are designed and deployed ethically.[23] Some companies have designated ethics officers or review boards to oversee these principles. Microsoft, which describes itself as a "moral leader" in technology, has established a program called AI for Good that develops AI applications to help solve humanitarian issues.[24]

[22] "Ethics Guidelines for Trustworthy AI," European Commission: https://ec.europa.eu/futurium/en/ai-alliance-consultation/guidelines.

[23] "AI at Google: our principles," Google: www.blog.google/technology/ai/ai-principles/.

[24] "AI for Good," Microsoft: www.microsoft.com/en-us/ai/ai-for-good.

Next Steps on the AI Journey

The technology industry is an early and enthusiastic adopter of AI, and it has the potential to make large leaps forward in the next few years. Yet in many ways, these companies are just beginning their AI journey. Several fundamental questions and issues remain to be debated and addressed within the C-suite and throughout the organization.

First, technology officers should continue to work with and educate senior management about the promise and risks of AI. Senior management's willingness to invest in AI should not be relied on by tech leaders as an assurance of continued and unconditional support. Second, management needs to understand exactly how AI will produce shareholder value. Accordingly, tech leaders should not assume they are beyond the pilot phase with AI.

Companies also will likely find it advantageous to create a talent development plan for AI initiatives, if they have not already done so. Even in technology, it's far from clear where the talent pipeline is coming from and how big it may be. Many tech companies are part of an ecosystem that could be an important source of talent.

Several organizations are also engaging in the discussion about ethical IT, as the debate about it only grows stronger. Tech companies can be thought leaders on this topic, and they have an opportunity to be responsible stakeholders in the discussion (their stakeholders expect it). To that end, tech companies will want to consider the risks and rewards of AI development, taking a balanced approach that prioritizes good governance and responsibility to the larger community.

Protiviti has touched on this issue in a series called "The Responsible Technology Firm of the Future." In part four of that series,[25] we focus on corporate social responsibility and what it means for a technology company today.

We believe the responsible tech company is attuned to the evolving expectations of its stakeholders. That means leadership thinks about the company's impact on society and always seeks to strike a balance between its business interests and the public interest. A good example of how CEOs are trying to focus more on corporate social responsibility concerns can be seen in the Business Roundtable's revised "Statement on the Purpose of a Corporation."[26]

With respect to advanced technologies like AI, responsible tech companies recognize that some portion of the workforce is being marginalized by these advances. Accordingly, the tech industry has a responsibility to help people make the transition to the jobs of the digital economy through retraining and reskilling. That also means tech companies should seek to collaborate with other companies deploying digitization and automation tools, as well as higher education and the public sector. Business and academic leaders who build on existing partnerships and develop new ones can give students and new recruits the comprehensive skills they lack and establish a framework for reskilling experienced workers. Governments can design policies that support reskilling for workers on an ongoing basis.

AI is opening doors to innovation and transformation, for businesses as well as employees. Technology companies have already embraced AI as a disrupter. These businesses, moving forward, can find AI success — and likely achieve the ROI they seek — by channeling that disruption constructively. Implemented thoughtfully and strategically, AI can be good for society, and it can change the way that work is done, freeing employees to do more strategic work. It can mitigate security risks, and it can deliver a better customer experience and, ultimately, competitive advantage.

[25] "The Responsible Technology Firm of the Future," Part 4, Protiviti: www.protiviti.com/US-en/insights/responsible-tech-series-part-4.

[26] "Business Roundtable Redefines the Purpose of a Corporation to Promote 'An Economy That Serves All Americans,'" Business Roundtable, August 19, 2019: www.businessroundtable.org/business-roundtable-redefines-the-purpose-of-a-corporation-to-promote-an-economy-that-serves-all-americans.

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