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Why technology is the strategic issue of our time

And what CEOs and their leadership teams should do about it

Today's fastest-growing companies have one thing in common—they harness technology and innovation to their advantage. Cloud, artificial intelligence (AI), machine learning (ML), and faster connectivity fuel business model disruption and industry transformation. Yet for every shining star, we see a struggling one. *Newspapers. Travel agencies. Taxis. Film photography. Landline phone service. Cable television. Video rentals.* They too invested in technology. What did they miss?

Winning in today's market requires teams to go beyond using technology for the core of their businesses. It requires chief executive officers (CEOs) and their teams to actively and aggressively build new businesses, business models, products, and services using these powerful, rapidly maturing technologies, and it requires breaking through five myths that permeate management thinking in this space.

Believing in a single myth impedes an organization's prospects for growth and breakthrough thinking. Buying into multiple of these myths can erase those opportunities altogether.

A broad set of robust and rapidly maturing technologies—from cloud to AI to 5G—is rapidly and fundamentally changing what is possible for companies and how they compete.

Five myths that permeate management thinking

1

Technology is the responsibility of Chief Information Officers (CIOs) and Chief Technology Officers (CTOs)

2

Technology is a silver bullet

3

Technology > strategy

4

All tech companies should act like Silicon Valley behemoths

5

Newcomers will disrupt incumbents

Myth 1: Technology is the responsibility of CIOs and CTOs

CEOs must own the technology vision

While many companies see technology as a foundation for optimization, few leadership teams harness technology to break into new markets, and fewer still use technology advancements to underpin new business models. Why? Existing metrics and management dynamics in most companies guide leaders to focus on optimization of current business models, not the invention of new ones.

CEOs who are uniquely measured on long-term, enterprise value creation must understand the possibilities created by technology advancements, articulate a vision for harnessing technology that delivers superior economic value, and subsequently align their teams' metrics to that vision. CEOs are the only ones who can rise above the everyday demands of current business models and existing metrics to focus on the longer-term potential for value creation provided by significant advancements in a range of powerful new technologies.

Collectively, the entire leadership team should work together to orchestrate how the company harnesses technology innovations to capitalize on new market opportunities. While technology leaders like the CIO and CTO play a vital role in crafting these opportunities, this job cuts across the entire C-suite. Successfully entering new markets and deploying new business models requires deep customer understanding and operational know-how—domains that extend beyond the CIO and CTO. Capitalizing on technology innovation and driving disruption requires strong leadership from the CEO first, followed by support from all members of the executive team.
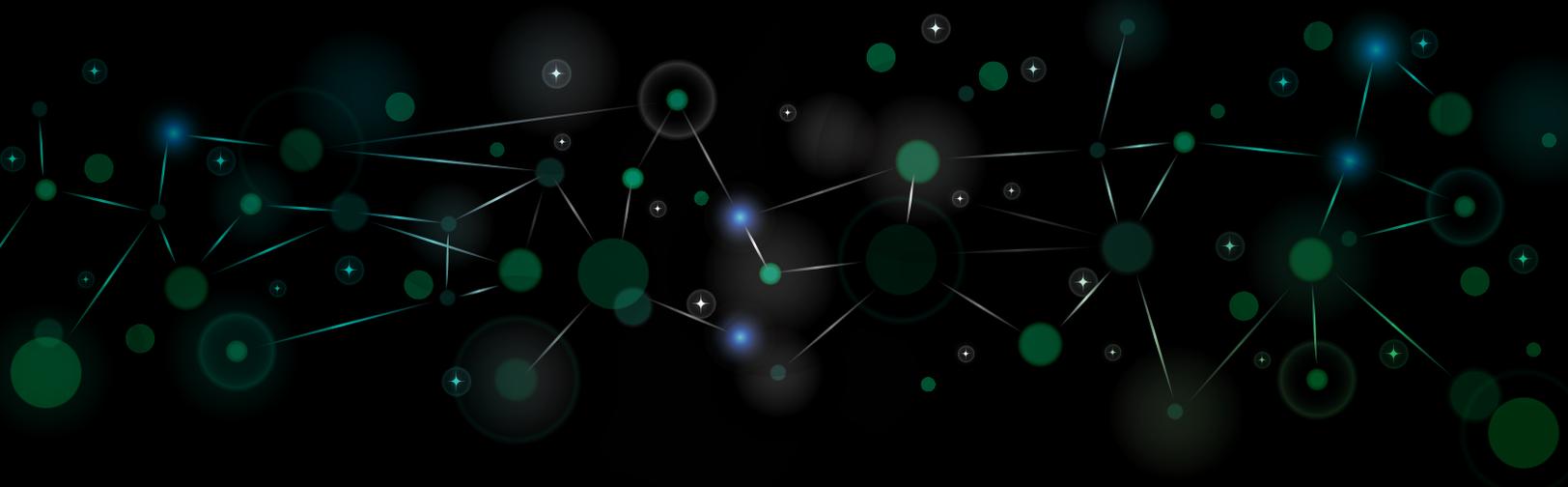
Capitalizing on technology innovation and driving disruption requires strong leadership from the CEO first, followed by support from all members of the executive team.

Myth 2: Technology is a silver bullet

Technology is *not* a silver bullet

Business leaders enacting a compelling vision for value creation require a deep understanding of technologies' functionalities and economics—though not an equal understanding of *all* technologies. Within industries, select technologies drive outsized opportunities to create value. Understanding the technologies with potential to magnify *your* value creation is crucial to leading effectively as a CEO, Chief Strategy Officer (CSO), or business unit leader.

Many of the technologies getting press today, such as AI and ML, are not new. These concepts originated decades ago, but as late as the early 2000s, were bound by the cost of compute power and the aggregation and usability of data. When cloud computing gave rise to nearly infinite, on-demand, and scalable compute power a decade ago, theory became economically viable. Companies that previously lacked the infrastructure to run AI algorithms could now do so. In parallel, connected devices proliferated, allowing us access to more data to feed algorithms. Access to more data gave us the ability to write smarter algorithms, jumpstarting the true power of AI and ML.

Today, advanced computing chips are further increasing processing speeds and reducing the cost of running algorithms on growing data sets, while advanced communication networks like 5G improve our ability to direct actions based on algorithmic outcomes; and, with the vast microservice storefronts offered by cloud providers, deploying these technologies is easier than ever. It is this convergence that differentiates today's technology landscape; understanding the implications and opportunities made possible from this convergence is critical for C-suites.

Are C-suites that understand and deploy cloud, AI, and advanced computing in their organizations then positioned to win in their markets? Not necessarily. Not all technologies are equally valuable for all businesses. To drive focus on which technologies to apply to which parts of their business, CEOs and their teams need to ask:

1. How does our business fundamentally create value for our customers?

2. What technologies could help us amplify and optimize that value?

While the answers to the second question can be many, a more limited set of technologies emerges based on the core value-creating activities of a company. CEOs and their teams will have a deep understanding of the fundamental way in which their business creates value and the activities needed to do so. Focusing on these core value-creation activities and the technologies that apply most directly to enhancing those activities will help C-suites place more effective, targeted bets.

Understanding the technologies with potential to magnify your value creation is crucial to leading effectively as a CEO, Chief Strategy Officer (CSO), or business unit leader.

Technology is *not* a silver bullet (continued)

Consider retail. Traditional retailers create value by connecting consumers with products in physical spaces. In this environment, optimizing the use of space, particularly shelf space, is critical to value creation. Supply chain routing and customer experience also play important roles in the value creation process. In this environment, sensor networks, base-level robotics, and communication networks play critical roles in value optimization. Sensor networks feeding data to AI algorithms can help retailers better optimize inventory mix and in-store merchandising. Robotics can drive more efficient supply chains and routing. Technologies like computer vision, sensor fusion, and deep learning enable the checkout-less experience of Amazon Go. However, for physical retailers, technologies like advanced computing, biological technologies, and more exotic robotics are less likely to play a *key* role in the near-term value optimization.

Contrast this to online gaming companies that create value by engaging consumers in digital spaces. For these companies, virtual and augmented reality become key tools in value creation. Additionally, IoT and 5G networks make it possible to engage customers in near real-time and with seamless physical-digital experiences. Robotics, however, is less likely to impact a gaming company's core method of value creation.

Now, imagine how health care, hospitality, and tourism—all industries that engage consumers in physical spaces—might leverage technology in similar ways as retailers, and imagine how e-commerce companies might borrow value optimization strategies from gaming. Regardless of industry, it is critical to first answer how your organization fundamentally creates value before understanding and applying the growing landscape of potentially disruptive technologies.

Technology is not a silver bullet. ERP, CRM, and HR systems are necessary but not sufficient. Cloud and AI are ubiquitous (they are both foundational, powerful technologies that will drive nearly all new growth plays), but technologies like advanced robotics, digital reality (AR/VR), blockchain, and sensor networks should not be ubiquitous. Focusing on a business' core value creation—and the technologies that optimize that value creation—helps business leaders drive more meaningful technology-enabled strategies.

Focusing on technologies that apply most directly to enhancing value-creation activities will help C-suites place more effective, targeted bets.

Leading cloud players driving technology convergence

Ubiquitous connectivity and data access. Convergence of the physical and digital. Self-learning machines that get smarter over time. Cheap computing power that, thanks to cloud, is almost infinitely flexible and scalable, and a vast storefront of digital microservices now available to companies as software as a service. These innovations—often being advanced by the large cloud platforms—are building on each other to create business opportunities that a few years ago, did not exist.

Taking 5G to the next level[1]
Amazon Web Services (AWS) launched a new service called WaveLength that sends and receives data with a network delay (latency) of less than 10 milliseconds, unlocking new possibilities in industries like autonomous vehicles where near instantaneous communication between vehicles would increase both safety and traffic efficiency. To do this, Amazon is working with large global telecom carriers to enable 5G and place computers and data at the edge of the network where they are closer to users.

Explainable AI[2]
One of the main challenges with AI solutions is that they have traditionally used a complex set of variables to test and enhance choices that maximize model fidelity but make it hard to understand, control, and correct their behavior. Google Cloud Platform is tackling this challenge through a new capability called Explainable AI, which is designed to make AI algorithms less mysterious and safer for businesses to rely on. Initially, the focus will be on models used for face and object detection, but over time it will expand to cover a broader set of AI applications.

IoT plug and play[3]
In mid-2019, Microsoft announced IoT Plug and Play for its Azure cloud platform. The new standard aims to address the problem of diverse IoT devices being unable to easily communicate with other devices and cloud applications. A standard playbook for device definitions—along with automation of the connection process—should improve device compatibility and reduce the time, cost, and complexity required for custom device integration, thus helping to boost IoT adoption.
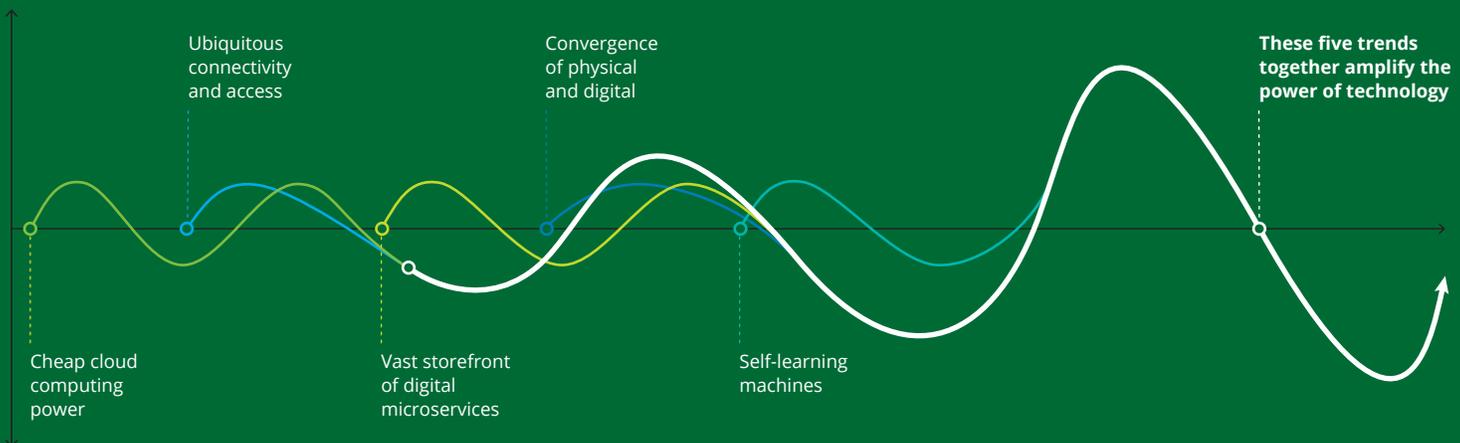
Ubiquitous connectivity and access

Convergence of physical and digital

These five trends together amplify the power of technology

Cheap cloud computing power

Vast storefront of digital microservices

Self-learning machines

Innovations—often being advanced by the large cloud platforms—are building on each other to create business opportunities that a few years ago, did not exist.

Myth 3: Technology > strategy

Technology requires strategy— and strategy requires technology

Too often, business leaders fall into the trap of anchoring on the technology, rather than on the *business impact* of technology. Well-intentioned aspirational statements like "we're going to become a data company" or "we're investing in AI" fall short of helping companies harness the full power of emerging technologies. CEOs have four choices for how to apply these powerful new technologies:

1. *Optimize* an organization's current business model and market

2. *Enter new markets* and better optimize value creation approaches than the market incumbents

3. *Create* enhanced and de-risked monetization models in an organization's current market

4. *Reimagine and transform* both a business model and market

In each case, new technology capabilities must inform leadership choices about where to play (markets, customer, geographies) and how to win (sustainable sources of advantage).

1 Optimize an organization's current business model and market

For a California utility company, the key issue facing the leadership team was not entering new markets, but optimizing and de-risking their existing one. Multiple years of drought and record-breaking wildfires had increased their risk exposure from older transmission towers and lines. For utility companies, the time-intensive and manual nature of inspecting miles of lines limits the frequency and effectiveness of maintenance efforts. A solution using remote sensing, cloud, data analytics, and AI is being deployed to fundamentally transform how infrastructure is inspected and defects are remediated. Remote Sensing involves drones, helicopters, satellites, and various sensors to collect rich data on asset conditions and situational awareness. Compared to the manual infrastructure inspection process, it's much faster, more efficient and data rich. These massive loads of unstructured data require cloud and advanced data analytics for storage and curation. From there, AI is being deployed to initially augment humans in identifying defects, and, it is expected that over time, human involvement will be significantly reduced while accuracy and operational efficiency will climb. The future of infrastructure management will be delivered by robots in the field, data analytics in the cloud, and AI embedded in key processes, enabling humans to focus on higher value-added activities and decision-making.

2 Enter new markets—and better optimize value creation approaches than the market incumbents

Converging technologies can also reduce barriers to entry, making it easier to expand into adjacent industries and markets. One leading data provider in the oil and gas industry found that incorporating advanced analytics into their services and then delivering those services via the cloud-enabled them not only to expand from providing raw data for analytics, but also to profitably serve hundreds of customers for whom the company's product price points had historically been too high. By harnessing technologies, they were able to broaden their customer base, while expanding their product portfolio.

3 Create enhanced and de-risked monetization models in an organization's current market

For one tech-enabled transportation platform, technology provided a new way to further enhance their revenue model. Whereas taxi drivers historically earned flat rates per mile driven, this company used mobile and real-time interfaces with drivers and riders, location data, and ML, among other tools, to identify areas of high demand and implement higher pricing. This pricing better balanced supply and demand in real time, while allowing the company to capitalize on changes in consumers' willingness to pay.

4 Reimagine and transform both a business model and market

Netflix is often—and quite rightly—cited as a case study in disruption. Cofounder and CEO Reed Hastings and his team have transformed both Netflix's business model (multiple times) and the markets in which it plays. Netflix began by disrupting the retail video rental market using mailed DVDs, then entered (and helped define) the streaming market, and, eventually, also pivoted into creating original content. Each of these disruptive moves coincided with the emergence of powerful new technologies: widely available broadband Internet in the case of streaming, and powerful data science and ML capabilities to enhance the applicability of original content. Their imprint on this market is profound; it is hard to think of a leading streaming service today that does not create at least some original content. Netflix has reimagined its business and taken advantage of key technologies multiple times on its way to creating a profitable platform with a sticky customer base.

To make a bet that ultimately pays off, CEOs should formulate a theory of how value will shift in a market drawing on both an understanding of core technologies for their business, and a deep appreciation for the economics of their market. They then must have the conviction to act, and to align their teams to execute.

Myth 4: All tech companies should act like Silicon Valley behemoths

Every company is a tech company, but not everyone needs to act like the Silicon Valley behemoths

Even among leading tech companies, Amazon, Google, and Facebook are unique in how they invest in and incubate new businesses. Each manages a wide-ranging portfolio of bets, from stratospheric balloons, streaming Internet and autonomous vehicles to drone delivery and VR headsets. To do this, these companies use extraordinary margins in their core business to fund an unwavering belief in technology-driven innovation.

However, that approach is not a one-size fits all for most companies. CEOs who push digitization without a clear-eyed view on the technologies core to their value creation model risk failure, just like those who push their teams to act like a tech company without articulating a vision for how to deploy technology. So, too, do the leadership teams who believe harnessing technology effectively means acting like a Silicon Valley behemoth.

How many technology investments should we make? How aggressively should we make them? The answers rest on both an organization's profit margin and its market context. High-margin companies operating in volatile markets can generally create and manage a broader portfolio of riskier bets than lower-margin companies operating in less volatile markets. While all companies need to make targeted bets on technology-driven growth and innovation, not all companies should take a "scatter the seeds and see what grows" approach.

Nor should all companies embrace technologies as they emerge from a place of theory to practicality. The risk of failure for a new feature in a consumer app is far different than the risk of a failure for a jet engine. While early adoption of new technologies can provide a competitive edge for some, for others, fast followership—or even late followership—is a smarter ambition.

Assessing risk and margin for strategic action

Limited, strategic bets on mature technology	High-volume bets on mature technology Experiments with emerging technology with a longer horizon for market introduction
Limited, strategic bets on *both* emerging and mature technology	High-volume bets on emerging technology

Risk: High / Low. Margin: Low / High
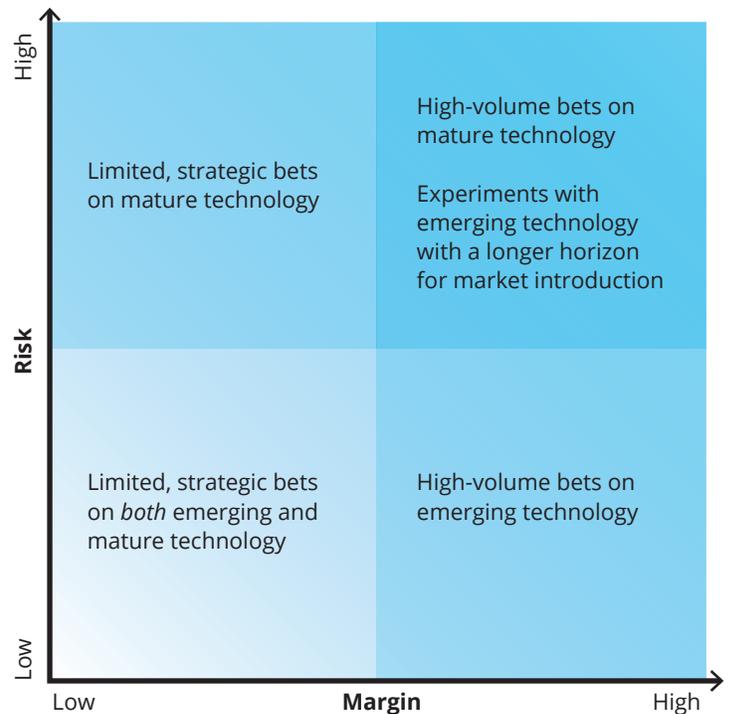
Smart implementation of a technology vision and smart technology innovation agendas vary in the same way that we see wide variation in the way companies operate, establish culture, and go to market.

New technology capabilities must inform leadership choices about where to play and how to win.

Myth 5: Newcomers will disrupt incumbents

Incumbents can maintain a competitive edge over newcomers

The future is bright for incumbents whose CEOs dig into the technologies core to their business, articulate a vision for how to apply technology to optimize and transform, and are thoughtful about guiding the implementation approach.

Stitch Fix, a retailing newcomer, who has aggressively optimized the retail chain using AI and, in doing so, disrupted the retail market, argues that the theories and technologies they apply to their business have long existed. On their website, they state, "a final bastion currently restricting the concepts to mere theory is people and culture (organizations are notoriously difficult to change). However, Stitch Fix seems to be relatively free of such impediments." It is not access to technology that distinguishes Stitch Fix, but rather, their willingness to embrace it.

For incumbents, being the disruptor, rather than the disrupted, means fighting strength with strength. Newcomers win because they are unburdened by historic processes and metrics aligned to optimizing the status quo. Nevertheless, incumbent CEOs have the power to realign metrics and free teams from the trap of 'this is how things have always been done' to harness new technologies. Furthermore, in entering markets or reimagining their business with technology, incumbent teams can build upon powerful existing assets: access to capital, customer relationships, data, expertise, and technical know-how, among others.
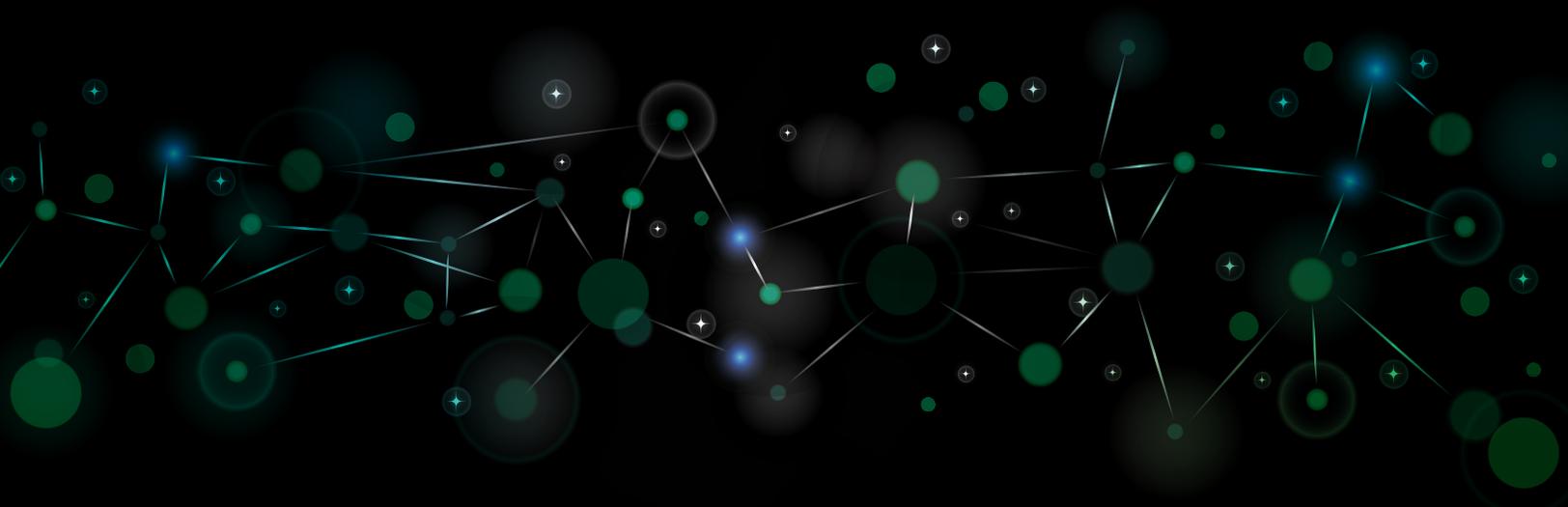
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Fighting strength with strength

Incumbents often described as at risk of disruption, actually enjoy numerous strengths, such as access to capital, customer relationships, data, expertise, and technical know-how, among others. These can be deployed to help take advantage of new technologies, drive innovation, and fend off potential disruptors, and there is good evidence that this is happening across industries.

Walmart and other large, incumbent retailers are using their retail stores, sales associates, and extensive supply chains, in combination with new, online capabilities to provide more convenient and cost-effective ordering, pickups, and returns—something pure online retailers can't do.

A nearly 100-year old, global industrial equipment manufacturer is proactively creating a connected sharing economy for its heavy equipment by enabling a subscription model that helps owners address multimillion-dollar machines sitting mostly idle. Using sensor and IoT data collected via the cloud and sophisticated analytics, this incumbent is creating a new market and new value for its customers.

Cargill, a global leader in food, agriculture and nutrition, is partnering with Cainthus to apply advanced computing and analytics to enhance on-farm decision-making. By using predictive imaging (including cow hide pattern and even cow facial recognition!), data and analytics (such as food and water intake and heat detection) the system is able to analyze and enhance on-farm decisions that can impact milk production, reproduction management and overall animal health.

Amazon, which is typically held up as a disruptor, actually began selling books online in 1995, nearly 25 years ago. Since that time, it has leveraged its infrastructure, knowledge, growth-oriented culture and innovation experience to expand into selling a vast array of products. In more recent years, it has applied that same know-how to other areas, becoming a leading provider of web-based computing resources through its Amazon Web Services, as well as branching out into other areas such as retail, logistics and distribution, and, most recently, health services.

Incumbents actually enjoy numerous strengths that can be deployed to help take advantage of new technologies, drive innovation, and fend off potential disruptors.

CEO keys to success

What does this mean for CEOs?
And what should they and their teams do?
In our experience working with leading tech companies (and tech-savvy traditional companies in a variety of industries), we have identified six C-suite actions that can help companies win by successfully harnessing disruptive technologies:

Focus on technology's business impact rather than the technology itself.
Stay focused on the core value creation activities of your business and understand the evolution of the technologies that directly impact them. Evaluate how changes in those technologies impact your decisions about optimization, market entry, monetization model evolution, and business transformation.

Don't mistake experimentation for strategy.
Investing in a wide range of technology pilots can be useful in the right market contexts; however, you also need a comprehensive strategy for harnessing disruptive technology in your business. An assortment of individual use cases is not a strategy. When you find pilot programs that deliver real business value, scale quickly to maximize the benefits.

Develop strategy at digital speed.
Traditional strategy-setting processes cannot keep pace with the rapid strides in technology advancement (or those of your tech-savvy competitors). Instead of updating your five-year plan every six to 12 months, develop and maintain your vision and mission while continuously developing and refining your digital strategies to support them. Be willing to rapidly change—or even abandon—strategic choices that are not working.

Favor sensing over forecasting.
Given the dizzying pace and complexity of advances in digital technology, accurate forecasting is virtually impossible. Instead, make a hypothesis about how the market will evolve and establish systems and processes to continually monitor for new developments in the marketplace. Adjust your strategies and actions when those developments suggest a change in your hypothesis. Get early exposure to emerging technologies by having your company actively engage with innovators, such as start-ups, universities, and noncompetitors in adjacent industries, and pursue an outside-in perspective, looking for insights that are market driven. Explore building institutional sensing approaches like dedicated sensing teams and regular trips to innovation hubs like Silicon Valley that focus on those technologies core to your business.

Innovate with your ecosystem.
Capitalize on other companies' innovation efforts by partnering with other players in your broader ecosystem rather than working alone. In today's API-driven world with a vast array of start-ups selling specific solutions, most incumbent companies' default choice should be to buy (or partner), not build. Furthermore, find ways to innovate on other companies' platforms and encourage other companies to innovate on yours.

Collaborate on technology activities across the C-suite.
Once a CEO defines a vision, it takes many parts of the business working in concert to make smart trade-offs, such as which technology projects to fund, where to aim them, how many to take on, which ones to abandon, and when to add capacity. Benefits and business cases for disruptive technologies often extend beyond a single business unit, and the greatest value often comes from multidisciplinary efforts. Such efforts can be tough to execute for a variety of reasons, including business and technical complexity, internal politics, and competing agendas. Instead of shying away from these challenges, leaders from all parts of the business should partner to tackle them head on—jointly leading, funding, and staffing the company's most valuable digital initiatives despite the complexity.

Embracing technology disruption

The influence and impact of disruptive technologies is the strategic issue of our time. Regardless of what industry you are in—or what parts of the company you manage—technology can enhance and amplify what you do. Waiting to see how things shake out—or delegating all technology issues to the CIO—is no longer a viable option for today's CEOs and their teams. To lead effectively in an increasingly technology-enabled world,

C-suite leaders should personally understand and embrace disruptive technology and proactively develop new strategies and collaborate across the C-suite to ensure technological innovations are working for their company. We believe markets will reward those CEOs and leadership teams who move quickly and intentionally to embrace these technologies to transform their business.
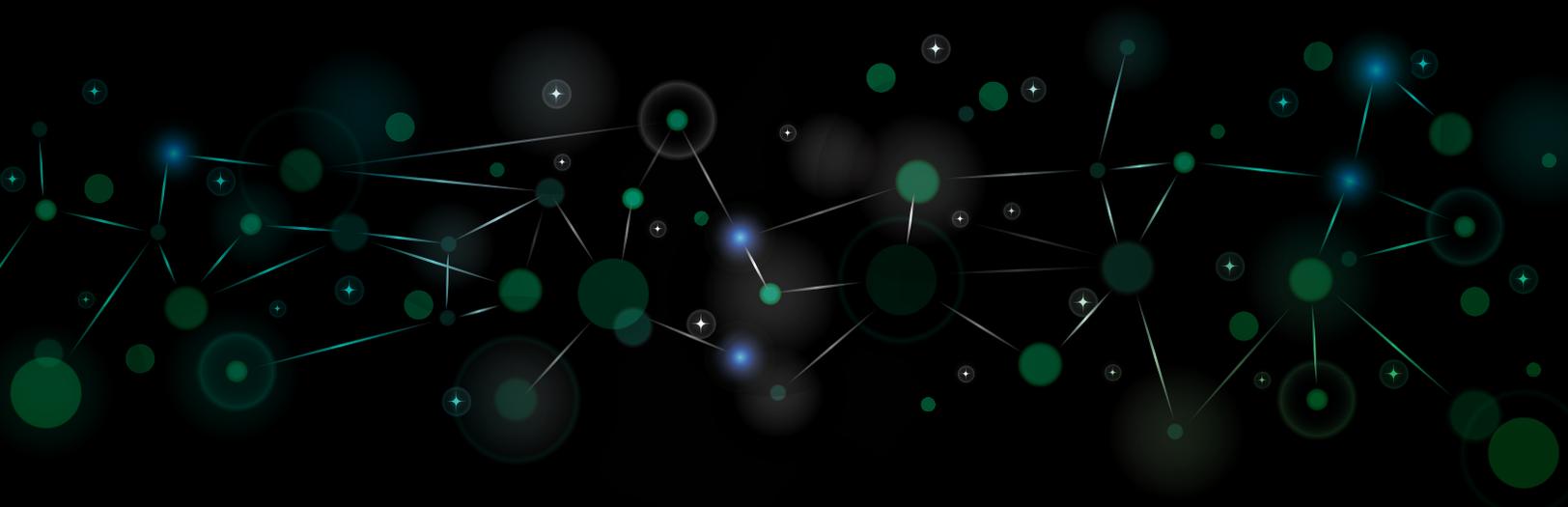
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Endnotes

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