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Insights

Manifesting legacy: Looking beyond the digital era

2018 global CIO survey

TECH TRENDS AND TRANSFORMATION

As digital reality, cognitive, and blockchain continue to redefine IT and business, organizations should look to move beyond vertical or horizontal approaches to new technology. Ideally, strategy, technology, and operations should work together, in harmony, across domains and boundaries.

Learn more about **Deloitte's Consulting Services**, which bring together executives across the C-suite to solve complex problems and uncover new opportunities, including: **The Future of Mobility**, **Internet of Things**, **Business Transformation Services**, **Digital Enterprise**, and **Cyber Risk Services**.

Contents

PREFACE

Manifesting CIO legacy beyond the digital era

I N THE PAST, as organizations developed back-end technology to support business needs, the CIO's primary mandate commonly was to "keep the lights on and the trains running." Business growth was often defined as increasing scale, complexity, and integration of systems—objectives that required CIOs to be trusted operators, focusing almost exclusively on operational excellence. They could build a legacy by providing operational discipline and enabling technologies that were efficient, reliable, and cost-effective.

In 2015, Deloitte's global CIO survey, *Creating legacy*,[1] introduced the trusted operator, change instigator, and business cocreator as three distinct pattern types that represent how CIOs deliver value to their organizations (see sidebar "CIO pattern types" for more detail).

We surmised then that no pattern type was superior; instead, each was a manifestation of the organization's specific needs and mandates. The 2016–17 survey, *Navigating legacy*,[2] expanded on this theme by concluding that CIOs' roles were likely to shift among these pattern types over time as the needs of the organization changed.

Our 2018 survey reflects the immense changes brought about by the digital era.

Our 2018 survey reflects the immense changes brought about by the digital era. The third and final CIO legacy report, *Manifesting legacy* suggests that although 55 percent of CIOs are currently serving as trusted operators, this pattern type will gradually become obsolete as the digital era progresses. To remain relevant and influential and help their organizations use technology to enable business strategy,

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CIO pattern types

These two pattern types will likely contribute to the two mandates of the CIO in the future—transforming business operations and driving top-line revenue and growth.

CIOs should shed the perception of being operationally focused.

Business cocreators spend most of their time driving business strategy and enabling change within their businesses to ensure effective execution of the strategy.

Change instigators take the lead on technology-enabled business transformation. They also focus on delivering emerging technologies and supporting business strategy.

Trusted operators deliver operational discipline by focusing on efficiency, reliability, and cost. They provide enabling technologies and align with business strategy.

CIOs should develop themselves as change instigators and business cocreators.

Today, organizations typically expect CIOs to do more than keep the lights on and the trains running. Survey respondents indicate that the top two expectations of CIOs are to align to business strategy and transform business processes, with IT operational excellence following as the third. Yes, CIOs should build and maintain solid back-end core systems, but they also need to leverage digital technologies to streamline business processes, engage employees and customers, and drive new value-generating business models. For many organizations, business strategy and technology are inseparable; business leaders understand the influence of both.

For CIOs, digital can present an uncommon opportunity to realign their roles to the new business reality. And this is where it gets personal: Are you satisfied being known mostly as a competent functional leader? Or do you want to help shape and lead the digital future of your organization? That's a choice you may need to face sooner than you think. And, if you're inspired to elevate and expand your role, how do you go about realizing that ambition?

FIGURE 1

The state of the CIO role

1,437 Survey participants

71 Participating countries

23 Participating industries

Two key mandates of technology leaders

1 Transforming enterprise business operations

2 Driving top-line growth & revenue

Transformations required to deliver on the mandates

- Leadership competency & IT brand
- IT talent & skills
- Operating model & delivery
- Enterprise technology platforms
- Technology-enabled innovation capability

Current role of survey participants

Technology leaders: 78% | Business leaders: 22%

Global/enterprise CIO or equivalent **55%**
Division/business unit/region/country CIO **20%**
Chief technology officer **8%**
Senior technology decision-maker **6%**
Other **11%**

Chief executive officer **25%**
Chief financial officer **18%**
Business unit leader **14%**
Executive/management committee **12%**
Board of directors **9%**
Other **23%**

Survey geography

46% Europe
18% North America
17% South America
13% APAC
5% Middle East & Africa

Note: Percentages may not total 100% due to rounding.
Source: 2018 Deloitte global CIO survey.

3

PREFACE

Are there deliberate actions, behaviors, shortcuts, and avoidable detours that could accelerate and amplify the path to an evolved tomorrow?

This year's global CIO survey of 1,116 CIOs and 321 CXOs reveals the current state of the CIO role—and what will likely be required for CIOs to remain relevant over the coming years.

Nearly 10 percent of this year's survey respondents are leaders who have advanced farther in the journey of incorporating technology into their digital business strategies than others. These respondents report both that their organizations have a clear digital vision and strategy and that the IT organization is perceived by the rest of the business as a market leader in terms of digital and emerging technologies (see figure 2).

FIGURE 2

Only 10 percent of CIOs represent digital vanguard organizations—leaders in aligning technology and digital business strategies that may serve as role models

QUESTION ONE
What is the business perception of your IT function's understanding of, readiness for, and responsiveness to digital and emerging technologies?

QUESTION TWO
Does your organization have a clear digital vision and strategy?

9.7%
DIGITAL VANGUARDS

Organizations that have a digital strategy and IT is perceived as a market leader

87%
IT perceived as fast follower, laggard, or delinquent

13%
IT perceived as a market leader

58%
Digital strategy exists at enterprise level or in business areas

42%
Organization has limited or no digital strategy

CIO N=994, 1,094.
Source: 2018 Deloitte global CIO survey.

We call these organizations *digital van-guards*. We observed measurable differences between these organizations and *baseline organizations* in terms of defining the CIO's role, acquiring and retaining IT talent, allocating funding and investments, and ultimately delivering value. Digital vanguards have not yet reached their digital destination, but they are a few years ahead of the rest. They serve as a guide for what the future may hold beyond current digital initiatives.

The digital era presents CIOs with the opportunity to *look inward* and reinvent themselves by breaking out of the trusted operator mold. We note, as in previous surveys, the importance of strong relationships to the CIO's business success. This year we suggest that developing a technology fluency program can help create a solid foundation for these relationship-building efforts. A tech fluency program can provide organizations with knowledge about technology trends, scalability of emerging technologies, and complexities of managing legacy core systems—while enabling CIOs to understand internal and external customer perspectives.

CIOs can also *look across* the IT organization and transform it, particularly by focusing on the IT operating model, funding priorities and budget allocation, and tech talent and culture at the heart of their digital agendas.

Digital vanguards serve as a guide for what the future may hold beyond current digital initiatives.

Finally, CIOs can *look beyond* emerging technologies at the peak of their popularity—although many of these technologies may be fundamental to the organization's digital vision—to the technological core, which should be modernized to be a successful foundation for these new emerging technologies. The core can then become a platform for a systematic innovation process that helps CIOs foster credibility by driving an understanding of emerging technologies, strategically prioritize innovation projects, build business cases, and deliver proofs of concept.

In the digital age, technology has increasingly become a primary driver of business transformation and growth, ending the era of business-led, technology-enabled organizations. Today's successful organizations—and their CIOs—are adopting a technology-led, business-enabled mindset to drive transformation, growth, and revenue.

SECTION ONE: LOOK INWARD

More than half of CIOs surveyed are focused on efficient, reliable IT operations. Unless they transform themselves—and their organizations—they may fall short in meeting mandates for business growth and transformation that are increasingly driven by digital capabilities.

CHAPTER ONE

Reinvent yourself

MANY ORGANIZATIONS, REGARDLESS of industry, are looking to harness technology to drive business growth and transformation. For example, Canadian Blood Services CIO Ralph Michaelis notes, "Just about everything we do depends on technology. The organization depends on us to help transform business models and change the way it does business."

While new organizations are born digital, many CIOs in organizations that are digital non-natives struggle to close the gap between traditional technology stacks and emerging digital capabili-

ties—cloud, mobile, social, automation, cognitive, and more—that can enable streamlined processes, increase employee and customer engagement, and drive new business models.

In 2018, most CIOs surveyed (55 percent) continue to function as trusted operators who focus on IT efficiency, reliability, and cost containment (see figure 3). The minority take the lead on technology-enabled business transformation (change instigators) or drive and enable growth through the execution of business strategy (business cocreators). There has been very little change in CIO pattern type

distribution since our 2016 survey—a situation that cannot continue if CIOs want to remain relevant within their organization. As Univar Inc. CIO Eric Foster notes, "It's critical for CIOs to ensure that IT strikes the right balance between driving future tech-enabled disruption and being too focused on day-to-day technology needs—otherwise it's easy to suffer from the perception that we're not thinking about business value and outcomes."

Evolution of the CIO: Trusted operator is not enough

Many CIOs certainly recognize the changes needed: They expect that leadership expectations and CIO responsibilities will evolve to be more transformative and growth-oriented over the next three years. However, this hardly means that their operational responsibilities will disappear; operational efficiency and reliability will likely remain a given, and the responsibilities of the trusted operator will likely become table stakes. But the day-to-day management of the technology infrastructure can be delegated to others within the IT organization or, in some cases, outsourced to outside vendors. "The organization expects us to be a business partner, not just evolve our IT operations," says CBA (Alumínio) CIO Luis Carlos Maldaner, "and prefers that we provide the link between technology and business performance while relying on external partners for technological capabilities." A shift in how the business expectations are evolving is evident, and IT is being brought to the table to discuss business issues, Maldaner continues, noting, "We are being engaged in new initiatives as business partners and being

FIGURE 3

The evolution of the CIO's role remains stagnant, with more than half of CIOs still serving as trusted operators—a role that will likely become obsolete
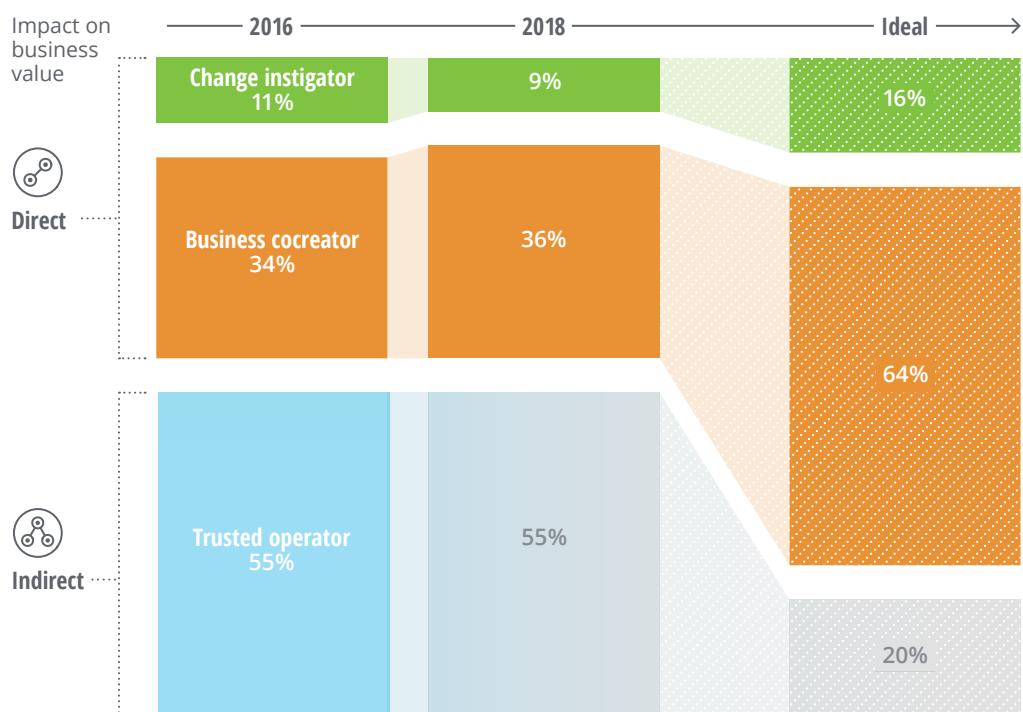
CIO N=1,116.
Source: 2018 Deloitte global CIO survey.

brought into discussions that are not necessarily related to IT."

WHAT GOT YOU HERE MAY NOT GET YOU THERE

For many, the transition from functional leader to organization leader will be challenging. Many CIOs rose to the position of IT leader based more on technology know-how than on vision, communication, or relationship skills. To become organization leaders, however, CIOs will likely need to develop the business and soft skills necessary to translate technology expertise into business solutions that drive revenue and efficiencies.

The traditional competencies around delivering results and being problem-solvers will likely carry less weight (see figure 4). Our survey data shows that CIOs recognize the need to evolve specific leadership skills in the future—focusing on delivering major organizational change (66 percent), building high-performance teams (63 percent), and influencing others (48 percent).

Additionally, CIOs will likely need to develop leadership values that center on providing direction, harnessing innovation, and empowering others to drive the digital agenda. Not surprisingly, digital vanguard CIOs list innovation as their top business priority (57 percent), followed by customers (56 percent), and growth (48 percent). In baseline organizations, innovation is listed as only the fourth most important business priority (43 percent), following performance (56 percent), customers (48 percent), and cost (44 percent). Digital vanguard CIOs appear to recognize the increasing importance of innovation given the rapidly changing landscape.

Digital vanguard CIOs are also 42 percent more likely than CIOs of baseline organizations to be business cocreators and change instigators, who have more of the skills and capabilities required to transform business operations and drive top-line growth significantly than do trusted operators.

CIO skills and capabilities aligned to business transformation and growth:

- Understand how to align new and emerging technologies to support market and business demands
- Develop, articulate, and communicate a clear vision for how technology can enable business strategy
- Develop influential relationships with leaders across the organization
- Create a high-performing culture to attract and retain top talent
- Engage ecosystem partners to deliver change

A CRITICAL MOMENT

This is a critical moment for CIOs who are ready to step out of the shadows and join the ranks of executives strategizing and executing the business's next moves. The digital era has arrived at an opportune moment for CIOs looking to burnish their business credentials.

Digital has brought many organizations to a crossroad where they must lean on technology to transform business operations and drive top-line growth. As technology gurus, many CIOs are well positioned to inform, shape, and lead their organi-

> **As technology gurus, many CIOs are well positioned to inform, shape, and lead their organizations' digital efforts.**

zations' digital efforts.

Leveraging their technology and business expertise, CIOs can use digital to become more engaged with strategic business initiatives and to help drive true transformation throughout the IT organization and across the business. Digital can present CIOs with the opportunity to be the business leaders that they want to be—and that their organizations need.

FIGURE 4

Traditional CIO leadership skills focused on operations and delivery may no longer be sufficient

Which leadership skills contributed most to your personal success as a leader? Which will do so in the next three years? (Please rank your top five.)

■ Current skills   ■ Skills in three years: Increase   ■ Skills in three years: Decrease

Skill		
Delivering major organizational change	57% ● ▶ 66%	
Building high-performing teams	53% ● ▶ 63%	
Being results-oriented	50% ◀ ● 66%	
Influencing others	45% ● ▶ 48%	
Emotional intelligence	46% ◀ ● 48%	
Bringing perspectives from outside the org	35% ● ▶ 39%	
Commitment to ongoing learning	33% ● ▶ 36%	
Solving complex problems	35% ◀ ● 46%	
Grit: Doing what it takes to succeed	32% ◀ ● 48%	
Financial acumen	14% ◀ ● 16%	

0%   75%
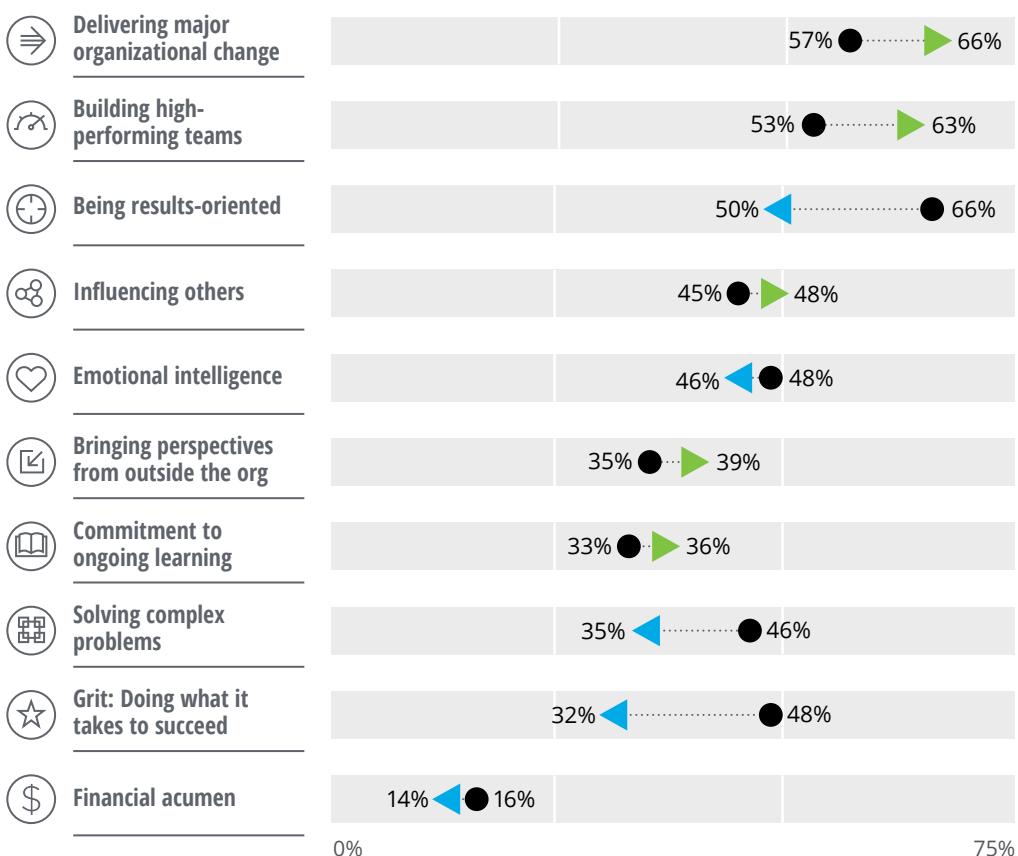
Leadership values for digital change[3]

DIRECTION
Provide vision and purpose to drive digital

INNOVATION
Create the conditions for experimentation

EXECUTION
Empower people to think differently

N=911.
Source: 2018 Deloitte global CIO survey.

SECTION ONE LOOK INWARD

Harness "digital" as a proxy for change

Ninety-six percent of the executives surveyed identified *digital* as a strategic priority, at either a functional or organization level. However, only a quarter of respondents say their organizations have an enterprisewide vision and strategy in place. Our data also indicates that the definition, span, and scope of digital varied significantly (see figure 5). Organizations are using digital technologies and capabilities to transform business operations (69 percent) and drive top-line growth through improved customer experiences (64 percent), two digital pillars that neatly align with CIOs' two mandates. IT is also engaged in its own initiatives: transforming IT infrastructure and cloud (51 percent) and organization platforms (50 percent). The absence of digital strategy and definition can present an opportunity for CIOs to lead—or at least influence and align—digital strategy and execution.

The lack of definition and clarity on digital is not necessarily a disadvantage: It can be turned into an advantage for CIOs who can help shape and define it. While 60 percent of CIOs surveyed indicate that they do not lead digital strategy development, 27 percent of those organizations in which another leader is responsible for the digital strategy still have a CIO responsible for leading digital execution (see figure 6). In other words, many CIOs already have one leg in the digital waters through their IT initiatives and responsibilities, but they likely need to expand beyond leading with the technology lens. They should prepare to expand their influence across other areas of the organization.

Now it's your turn: The CIO future is here

We are at the edge of a digital era in which many organizations, regardless of industry, are looking to harness emerging technologies to drive business

FIGURE 5

The scope and span of digital varies across enterprises, but process transformation and customer experience drive digital focus

What are the primary focus areas of digital within your organization? (Please rank your top five.)

Focus area	Percentage
Process automation and transformation	69%
Customer experience and engagement	64%
IT infrastructure and cloud	51%
Enterprise platforms	50%
Customer growth, segmentation, and profitability	49%
E-commerce and customer portals	43%
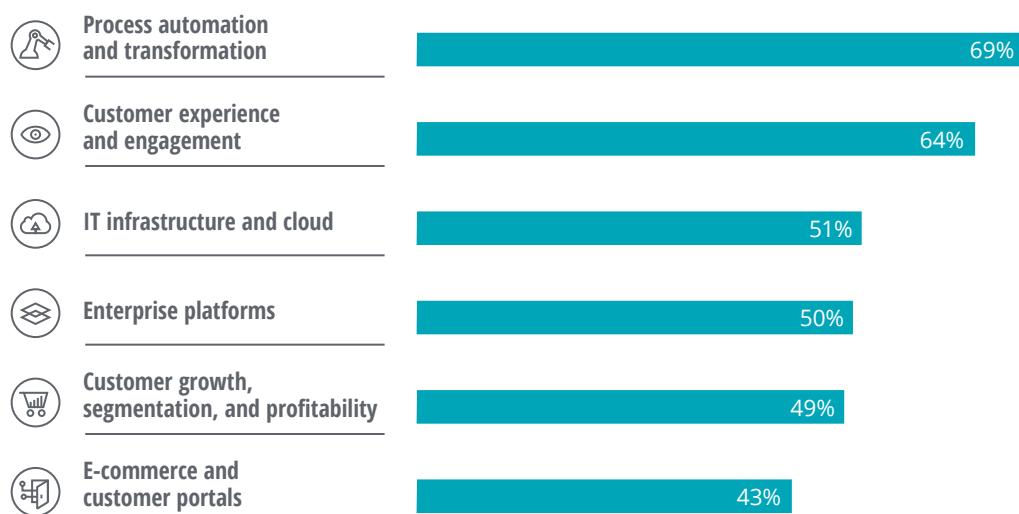
CIO N=1,014.
Source: 2018 Deloitte global CIO survey.

FIGURE 6

CIOs don't always lead digital strategy but are often still responsible for digital execution within their enterprises

Digital strategy
What is your role in developing your organization's digital strategy?

Digital execution
If you are not leading digital strategy, who is responsible for leading digital execution in your organization?

Leader 40%
Partner 30%
Supporter 15%
Adviser 12%

CEO	28%
CIO or equivalent	27%
Business unit leader	18%
CDO	15%
CMO	14%
COO	9%
Other	22%

40%
OF CIOS INDICATE THAT THEY LEAD DIGITAL STRATEGY

27%
OF CIOS STILL LEAD DIGITAL EXECUTION AMONG THE **60%** THAT DON'T LEAD STRATEGY

N=1,017, 606.
Source: 2018 Deloitte global CIO survey.

transformation and growth. In response to these changes, the CIO's role may be quickly shifting from being a steward of technology to a partner in shaping the future of the business. Nearly 70 percent of survey respondents agree that the CIO—even more than the CEO (61 percent)—will have one of the most important roles in driving digital initiatives in the next three years.

As technology leaders, CIOs with vision, communication skills, and relationships are well positioned to command more influence and responsibility than ever before.

"Digital transformation is less about a digital strategy and more about how to do business in a digital world. If we lead with technology, we're achieving digital insertion. Leading with the business outcomes ensures we are transforming."

— *Anne Mullins, CIO and corporate vice president, Lockheed Martin*

CHAPTER TWO

We need to talk

NEARLY EVERYONE WHO has traveled overseas knows the difficulty of conducting even simple transactions with someone who does not share your language. Building a meaningful, influential relationship can be next to impossible.

That's one reason why, for years, CIOs have been encouraged to learn the language of business—and many have become fluent. But as technology increasingly accelerates organizations, it can be equally important for the business to understand the language of technology. From the board and the C-suite to functional leaders and staff, everyone across the organization should be tech fluent.

Of course, it can be unrealistic to expect any executive to grasp all the IT jargon that rolls off a systems developer's tongue. But employees across the organization can try to understand three dimensions in which technology can enable business performance and growth:

- **Creating value.** Digital and other emerging technologies can help empower the business to streamline processes, engage employees and customers, and drive new business models.
- **Rewiring the business of technology.** Achieving this value can depend on transforming how organizations budget, fund, prioritize, and deliver technology solutions.
- **Developing priorities.** A strong technology foundation can't be short-circuited by shiny new technologies. Modernizing the core IT infrastructure to support business ambitions should not only be on the road map but also recognized as a strategic priority.

> A CIO—especially a business-savvy CIO—can play an important role within the organization as a technology interpreter, influencer, and visionary.

A CIO—especially a business-savvy CIO—can play an important role within the company as a

WHAT IS TECH FLUENCY?

Tech fluency—the ability to broadly understand and confidently discuss IT concepts[4]—can be an important skill for C-suite leaders, board directors, and employees throughout the organization. By promoting tech fluency and expanding it throughout the business, CIOs can help create a shared baseline of knowledge that engages leaders and employees and helps optimize technology's impact.

For example, business leaders who understand the fundamental concepts and benefits of technology solutions may be more likely to approve, fund, and participate in those initiatives. Developers, strategists, sales executives, and marketers can collaborate more effectively on products and customer tools.

An effective tech fluency program could include major systems and concepts such as:

- The core systems supporting the IT environment;

- Internal and external systems that enable major business functions (for example, finance, customer service, data management, cybersecurity, and sales);

- The company's business model, including the levers of profitability, technologies supporting business strategy and revenue generation, and the influence of technology on the business model over the last decade;

- Broader disruptive technology forces (for example, cloud, cognitive, and blockchain); and

- The role of technology in supporting market participation and fostering competitive advantage.

By leveraging their technology and business expertise to develop and drive tech fluency, CIOs can help enable organization leaders and employees understand and maximize technology's potential.

technology interpreter, influencer, and visionary. But that typically requires strong relationships across the organization. One important way to cultivate those relationships and increase influence is to help organization leaders become tech fluent.

Tactics for enhancing tech fluency

Business leaders often enjoy invoking new digital capabilities such as AI and augmented reality. But bring up risk management and the interdependencies of the current IT environment, and you'll likely hear crickets. Flashy digital capabilities may generate all the headlines, but they are built on a strong technology core and depend on hardware and software that are usually much less colorful.

Enterprisewide technology literacy requires more than one-off watercooler conversations. A well-structured education, communication, and engagement plan can help. While nearly all surveyed CIOs (96 percent) consider educating the business about technology issues to be one of their responsibilities, only 66 percent have developed proactive educational initiatives that reach beyond the executive level to help build tech fluency across the organization.

CIOs of baseline organizations tend to rely on ad hoc tech fluency exchanges such as bringing new and emerging technologies into strategy conversations (72 percent) and conducting one-on-one technology discussions (51 percent). Fewer use broader approaches that target the organization when compared to digital vanguard CIOs. For example, 34 percent of CIOs of baseline organizations hold enterprisewide briefings on technology fundamentals, compared to 44 percent of those in digital vanguards; and 30 percent of baseline organization CIOs recommend and provide training on

key technology topics, compared to 43 percent of those in digital vanguards (see figure 7).

Not only can these tech fluency labors help CIOs build strong business relationships, they can also help develop organizational support for digital strategies and burnish the CIO's image as an organizational leader.

CIOs can develop initiatives that drive up organizational tech fluency through broad-based programs, followed by individual curricula for specific audiences based on their needs and interests. Framing the conversation around specific technologies and issues and their business implications can help prevent business stakeholders from getting caught up in external hype. This usually requires careful planning along with customized learning via both formal and informal channels.

From colleague to influencer

Strong relationships can be essential for CIOs looking to elevate their roles and become organization leaders. CIOs report strong relationships with certain peers—especially back-office leaders—but even these relationships often tend to be transactional and ad hoc. Their relationships with executives in customer-facing functions such as

FIGURE 7

CIOs consider it their responsibility to help the business understand technology, but many have yet to develop comprehensive tech fluency programs

What initiatives do you have in place to help business leadership better understand technology?
(Please select all that apply.)

■ Digital vanguards ■ Baseline organizations

Bring new and emerging technologies into strategy conversations

82%
72%

Conduct one-on-one technology analyses and discussions

61%
51%

Share research on current technology trends and issues

55%   48%

Hold organizationwide briefings on technology fundamentals

34%
44%

Recommend and provide training on key technology topics

30%
43%

96%
OF CIOS CONSIDER IT TO BE THEIR ROLE TO MAKE THE BUSINESS MORE TECH FLUENT
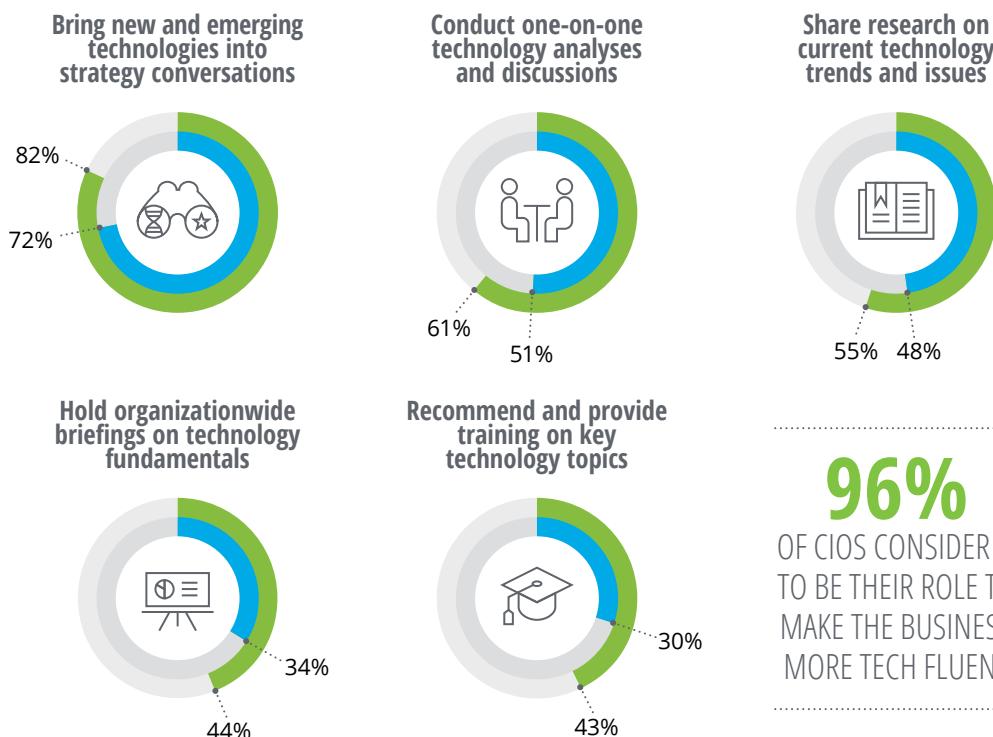
CIO N=873.
Source: 2018 Deloitte global CIO survey.

"In order for IT to be invited to the table as a strategic partner, we have to build credibility by delivering a highly available and secure production platform and by delivering successfully on major change projects. When those fundamentals of IT are in place, you can hold a conversation about how to make technology a competitive advantage for the business."

— *Rahul Samant, CIO, Delta Air Lines*

sales, marketing, and product development/engineering are weaker (see figure 8).

Our research shows that CIOs are 1.5 times more likely to report having a *strong* or *very strong* relationship with other business functions when they customize their tech fluency efforts. CIOs in digital vanguard organizations, comprising 10 percent of survey participants, are also more likely than their peers in baseline organizations to report strong or

very strong relationships with other business functions, particularly customer-facing teams.

Sixty-eight percent of digital vanguard CIOs report strong or very strong relationships with other business functions compared to only 60 percent of those in baseline organizations. The gap between CIOs in digital vanguards and those in baseline organizations is even more apparent when examining customer-facing functions: Sixty-five percent of

FIGURE 8

Digital vanguard CIOs are more likely to have strong relationships with both front- and back-office functions

How strong would you rate the IT function's relationship with the following business functions?

■ Digital vanguards   ■ Baseline organizations
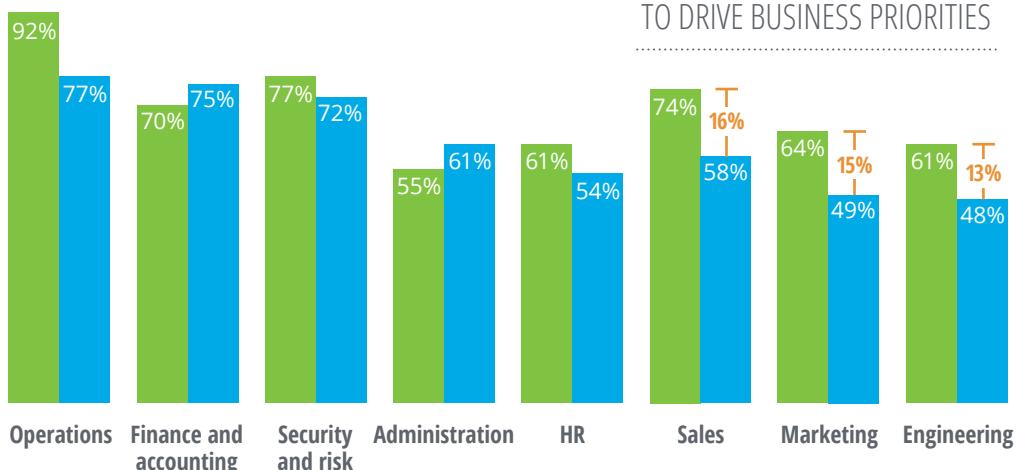
WEAKER RELATIONSHIPS HAVE OFTEN BEEN IGNORED BY CIOS, BUT THEY CAN BE NECESSARY TO DRIVE BUSINESS PRIORITIES

	Operations	Finance and accounting	Security and risk	Administration	HR	Sales	Marketing	Engineering
Digital vanguards	92%	70%	77%	55%	61%	74%	64%	61%
Baseline organizations	77%	75%	72%	61%	54%	58%	49%	48%
Gap						16%	15%	13%

N=931.
Source: 2018 Deloitte global CIO survey.

digital vanguard CIOs report a strong or very strong relationship compared to only 50 percent of those in baseline organizations.

To fulfill the business mandate to grow revenue and transform business operations, CIOs should consider developing technology fluency initiatives for both customer-facing teams—the revenue engines—and back-office functions, the fuel that keeps the organization running. Their differing needs may require customized technology fluency programs.

On the flip side, CIOs and IT teams also should be more fluent in understanding and addressing customer needs and expectations. More than half of IT teams collaborate with the business on projects to design and deliver customer engagement platforms (62 percent) or design customer products and solutions (55 percent). But fewer are involved in proactive measures such as introducing new technologies to improve customer engagement (48 percent), establishing joint processes with marketing and sales (42 percent), or analyzing data for customer insights (36 percent), all of which could result in stronger understanding and appreciation of customer needs and ultimately enable the

business to develop better customer solutions (see figure 9).

By deepening their interactions with customer-facing business units, CIOs can gain opportunities to initiate digital strategies to grow customer loyalty and revenue, which could help them evolve from order-taker to business adviser.

Face time with the board matters

The CIO's tech fluency strategy can be extended across the organization to its board of directors through consistent interactions and technology-focused conversations.

A company's financial performance can be directly linked to the tech fluency of its board of directors. A Deloitte study of US public companies shows that S&P high performing companies—defined as those that outperformed the S&P 500 by 10 percent or more over three years—are nearly twice as likely to have at least one tech-focused board member than lower performers (32

FIGURE 9

CIOs can establish joint processes and analysis capabilities to better understand customer needs and develop customer-facing solutions

Which of the following is true about how your IT function engages with the business to develop end-customer solutions? (Please select all that apply.)

Design & delivery	Build technology platforms to better engage with customers	62%
	Jointly design customer products & solutions	55%
	Evaluate emerging technologies to better engage with customers	48%
Analysis & collaboration	Collaborate with marketing & sales to establish joint processes	42%
	Gather & analyze customer data	36%
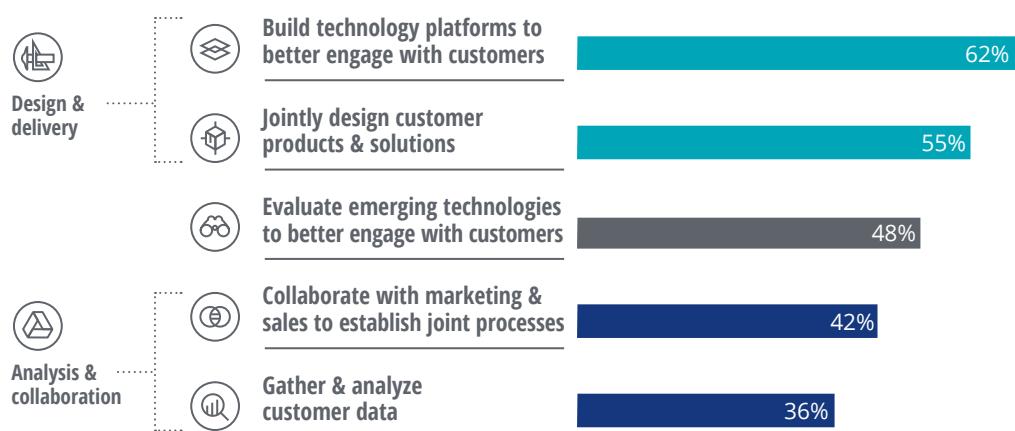
N=893.
Source: 2018 Deloitte global CIO survey.

> "Digital is transforming B2B industries such as ours to the point that our customers expect B2C experiences. We simply cannot operate without transformative technology. Whether it's providing the best customer experience, driving more value to customers, or delivering top-line and bottom-line results, technology is more than an enabler—it's like the air we breathe."
>
> — *Joel Grade, EVP and CFO, Sysco Corporation*

percent versus 17 percent).[5] And that's where the CIO can come in.

CIOs should strive to be executive leadership's trusted adviser for all things technology. And CIOs who have built their credibility with functional and C-suite leaders are more likely to be invited to the boardroom. "Boards expect CIOs to do more than provide operational excellence in managing risk and security," says Peggy Foran, chief governance officer, SVP, and corporate secretary of Prudential Financial Inc. "Boards tend to look at technology from the perspective of risks rather than opportunity, but they also expect CIOs to focus on innovation, products, solutions, and trends that transform businesses. If I were CIO, I would make it my mission to play not only defense but offense."

When it comes to board and subcommittee meetings, frequency matters (see figure 10). When CIOs interact with board members only annually, 91 percent focus on IT risk and cybersecurity, giving lesser attention to digital/innovation (39 percent) and technology return on investment (9 percent).

As the frequency of CIO and board interactions increases, the topics they discuss can become more balanced between technology risk and opportunities. For example, when CIOs meet with the board monthly, digital and innovation are discussed 75 percent of the time, with IT risk and cybersecurity dropping to 54 percent. Also, they are more than twice as likely to discuss technology ROI, increasing from 9 percent to 23 percent. This doesn't mean that IT risk becomes less important—

more likely, there's simply more time to discuss a wider range of technology topics and enhance the board's tech fluency. Digital vanguard CIOs are slightly more likely to meet with board members on a monthly basis (38 percent) than CIOs of baseline organizations (33 percent).

It's a two-way street

Technology fluency can be the vehicle for CIOs to take their stakeholder relationships to the next level. It can allow them to present a technology solution based on a business need and give them the opportunity to proactively equip and train their stakeholders to understand and engage with technology and ultimately drive business value.

Technology fluency can be the vehicle for CIOs to take their stakeholder relationships to the next level.

You'll know your tactics are working when business leaders—both back-office and customer-facing—and board members come to you for advice to help solve business challenges. Technology fluency can help you build stronger relationships with key stakeholders and gain valuable insights into the needs of the business, allowing you to increase your credibility as an organization leader.

SECTION ONE LOOK INWARD

FIGURE 10

An increase in frequency of interaction with the board and subcommittees often leads to more strategic technology discussions

What topics were discussed in your board meetings? How often do you interact with your organization's board or its subcommittees?

IT risk and cyber

Digital and innovation

Technology project ROI

Decreases with frequency

Increases with frequency

91%
82%
80%
75%
58%
54%
39%
39%
23%
18%
18%
9%

Frequency of interaction with board/subcommittees — Once a year — Every six months — Quarterly — Monthly —
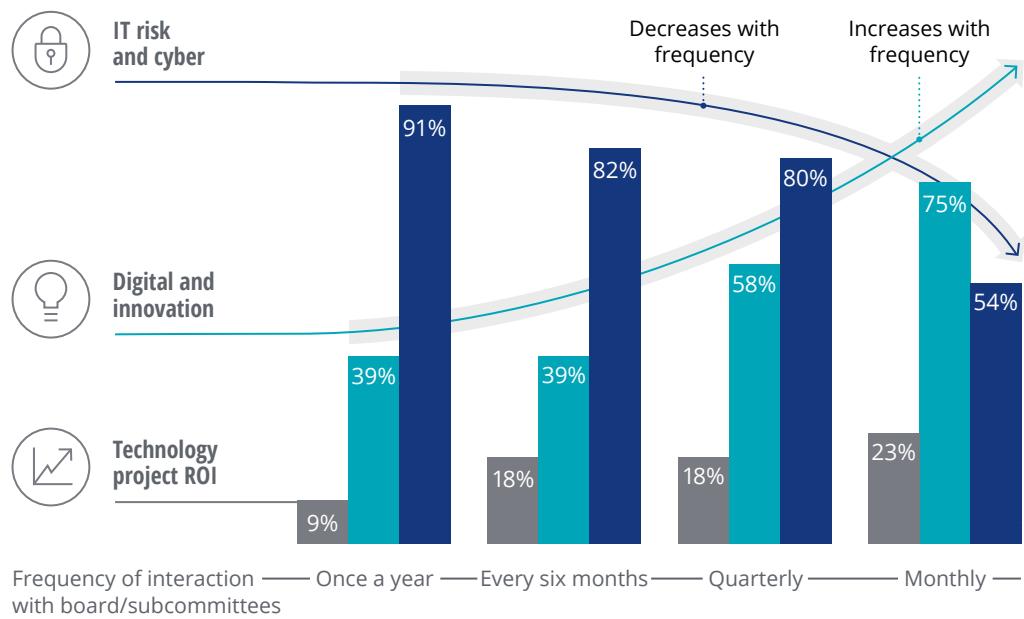
CIO N=978 and 877 respectively.
Source: 2018 Deloitte global CIO survey.

SECTION TWO: LOOK ACROSS IT

In recent years, some enthusiastic industry pundits and executives have diluted the meaning of transformation to the point where it's often invoked to characterize incremental improvements. But in the digital era, the rate of change truly is growing exponentially, and we can't expect IT's traditional ways of working to keep pace.

Real transformation likely demands a whole new approach to delivering IT services. It's a multifaceted challenge with two critical elements: money and people.

CHAPTER THREE

Follow the money

FEW IT ORGANIZATIONS today can support the rapid-fire change that's driving business—a fact that many CIOs recognize. Ninety-one percent of CIOs we surveyed expect to make one of the following changes to their IT operating model:

- **Implement flexible IT delivery (56 percent).** Agile, DevOps, or a similar IT delivery model—requiring iterative funding, a life-cycle view of the budget, and a mindset based on product rather than project—can increase IT responsiveness.

"If you have a governance structure that aligns IT to the business, IT delivery should just sing. The IT organization should be able to deliver what the business needs, maximize the value of technology investments, and improve every year."

— *Norm Fjeldheim, CIO and SVP facilities, Illumina*

- **Contract IT-as-a-service (56 percent).** Engaging service providers and partners to deliver usage-based IT services can help fill talent gaps, encourage innovation, and improve service delivery.
- **Guide architecture choices (54 percent).** Advising the business on technology architecture and infrastructure such as cloud solutions can help reduce costs, increase flexibility, and provide resilience.

Each of these changes could require significant financial investments and process changes, but each holds the potential to deliver long-term enterprise value. CIOs are often challenged to convince their peers that behind-the-scene technology investments are worthwhile. And only one-fifth of CIOs have access to dedicated finance talent who can help justify these investments to the C-suite and the board. "You have to partner to deliver quickly and keep up with the pace of the industry," says Kiwi Wealth CTO Dave Bruce. "A critical factor in being able to balance delivering on our own versus leveraging partners is the support from the board in allocating funding for us to innovate and try new things."

Only one-fifth of CIOs have access to dedicated finance talent who can help justify these investments to the C-suite and the board.

But the CIO is typically still on the hook to connect technology investments to business outcomes. This can become easier when IT and the business work together, jointly owning the full circle of investment processes from upfront planning to measuring results and impact. "I want IT to be viewed as enablers, so that people come to us with problems and ask how we can help them solve them. Too often we have rolled something out and haven't had any input or engagement from members of Parliament and their staff and that ends up in frustration and complaints," says Michael Middlemiss, CIO of Parliamentary Service of New Zealand. "Parliament is steeped in tradition, and there are processes and protocols that date back to the 1600s. People want to preserve some of those things, but for emerging technologies to benefit and add value there has to be a formal decision-making process that is jointly owned by IT and the people we serve."

Start here: Agree on what matters most

Our work with leading organizations shows that when IT and the business are aligned on investments and prioritization, they are more likely to have a significant impact on business outcomes. Unfortunately, the CIO survey indicates that IT/business alignment is uncommon. Only 52 percent of baseline organizations have a technology investment decision-making process jointly owned by IT and the business, and only 35 percent have a clear process for prioritizing IT investments. Digital vanguards are a little ahead: 60 percent share the investment process with the business, and about half have a clear process for prioritizing IT investments (see figure 11).

SECTION TWO LOOK ACROSS IT

FIGURE 11

CIOs across the board have the opportunity to be more diligent in establishing IT investment governance

Which of the following statements about technology investments in your organization are true?
(Please select all that apply.)

■ Digital vanguards   ■ Baseline organizations

Business and IT jointly own the investment process

60%
52%

Well-defined IT investment process and business case template

36%
40%

Coherent and transparent process for prioritizing IT investments

35%
51%

Structured process for measuring the value of IT investments

21%
30%

Dedicated finance staff to model and manage IT investments

19%
23%

Dashboards/scorecards to communicate benefits or costs

18%
28%

CIO N=876.
Source: 2018 Deloitte global CIO survey.

Digital vanguards are often more intentional about IT investment decisions than baseline organizations; vanguards have established more effective tech governance methods and are spending more of their IT budgets on business innovation compared to other organizations. But even these industry leaders have a long way to go.

Show me the value

Board members and senior executives expect a positive return on all investments, including technology. Many IT organizations come up short. Only about one-fifth of CIOs and CXOs agree that their organizations have a structured process for measuring

"CEOs are looking to IT to enable growth through technology innovation. This means changing the business mindset that IT is an expense versus an investment. This mindset change enables the organization to efficiently allocate funds for innovation and measure the results."

— *Subhasis Mukherjee, VP and CIO, Pekin Insurance*

the value of technology investments. And surprisingly, 14 percent of respondents don't measure the business impact of IT investments at all.

Of the organizations that do measure value, about two-thirds evaluate IT investments on a case-by-case basis. About a quarter rely on business leaders to measure IT investment outcomes. Only 27 percent evaluate technology investments using a consistent financial model—a leading practice that can improve accuracy, objectivity, and alignment with business strategy.

Measurement methods that digital vanguards use may be slightly more effective, but there's still plenty of room for improvement. Compared to baseline organizations, vanguards are less likely to measure business results on a case-by-case basis and more likely to have a financial model. Interestingly, they also rely more on their business leaders

for measuring the impact of IT investments on business outcomes, which could indicate closer alignment with their business peers (see figure 12).

Compared to baseline organizations, vanguards are less likely to measure business results on a case-by-case basis and more likely to have a financial model.

Budgets held hostage

Lack of effective investment governance isn't the only hurdle. As CIOs try to reallocate budgets to increase IT's focus on innovation and business improvements, the traditional fixed annual funding cycle and a lack of discretionary funds can restrict their options. Project-based funding models often

FIGURE 12

Measuring and demonstrating the impact of IT investments remains ad hoc
How do you demonstrate the impact of IT investments? (Please select all that apply.)

■ Digital vanguards ■ Baseline organizations

We measure on a case-by-case basis
67%
48%

We measure with a financial model
26%
34%

Business leaders are responsible for measuring
24%
35%

14% OF ALL ORGANIZATIONS SAY THEY DON'T MEASURE THE IMPACT OF IT INVESTMENTS (**10%** AND **15%**)
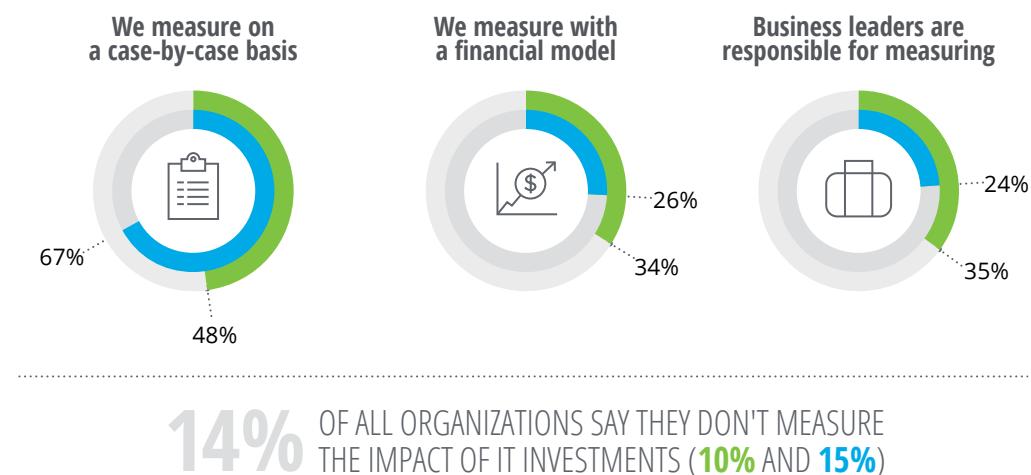
N=841.
Source: 2018 Deloitte global CIO survey.

FIGURE 13

Budget allocations remain similar regardless of industry, business needs, or digital maturity

How is your overall IT budget allocated?

	Consumer & industrial products	Energy & resources	Financial services	Life sciences & health care	Public sector & government	Technology, media & telecom
Business innovation	18%	19%	21%	18%	15%	21%
Incremental business change	26%	27%	27%	23%	23%	29%
Business operations	56%	55%	52%	58%	62%	50%
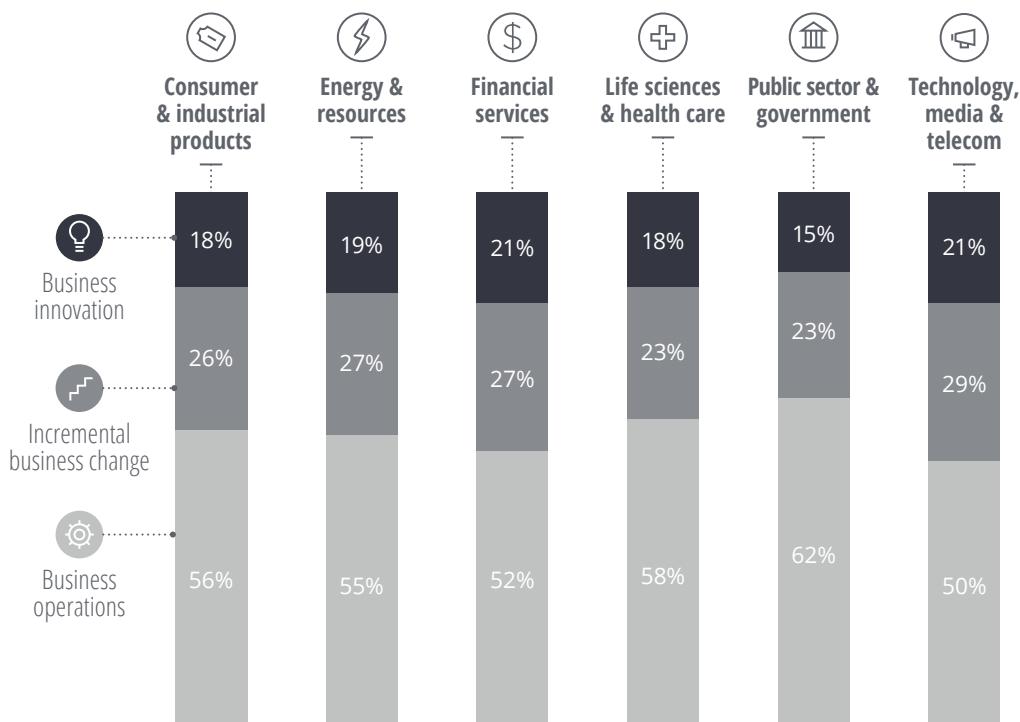
N=883.
Note: Percentages may not total 100% due to rounding.
Source: 2018 Deloitte global CIO survey.

lead to chronic underinvestment in technology innovation and offer little flexibility for shifting business or technology environments.

Many CIOs will recognize this annual budget routine, in which most of IT's budget is pre-allocated to ongoing business operations, and much of what's left is set aside to tackle the business's wish list of incremental improvement projects. Growth and innovation? That's practically an afterthought. Remarkably, CIOs report similar budget allocations across industries, even those with very different business needs (see figure 13).

Only a few years ago, it wasn't unusual for ongoing operations to make up more than 70 percent of IT's budget. Cheaper storage and processing costs, cloud platforms, and outsourcing

have helped drive down operating costs to about 56 percent today, but there's more work ahead. CIOs expect ongoing operational costs to continue to drop over the next three years, thanks in part to greater efficiencies created by cloud, process automation, and an increasingly modernized core. The question is whether CIOs can take advantage of those savings and put them toward business innovation.

Many digital vanguards are a few years ahead of other organizations in shifting budget focus from operations to innovation. CIOs in these organizations allocate less than half of their budgets (47 percent) to operations, with nearly equal amounts going to business mandates: business enhancements (27 percent) and innovation/growth (26 percent). Over the next few years, they anticipate

FIGURE 14

With less than half of their IT budgets allocated to operations, digital vanguards tend to lead in innovation spending

How is your overall IT budget allocated?

BUDGET ALLOCATIONS
SHIFT TO FOCUS ON INNOVATION

Baseline organizations   **Digital vanguards**

18%	26%	Business innovation *increases*
26%	29%	Incremental business change *remains stable*
56%	45%	Business operations *decreases*

26%	38%	
27%	29%	
47%	33%	

Current ⟶ **Future**   **Current** ⟶ **Future**

N=883.
Source: 2018 Deloitte global CIO survey.
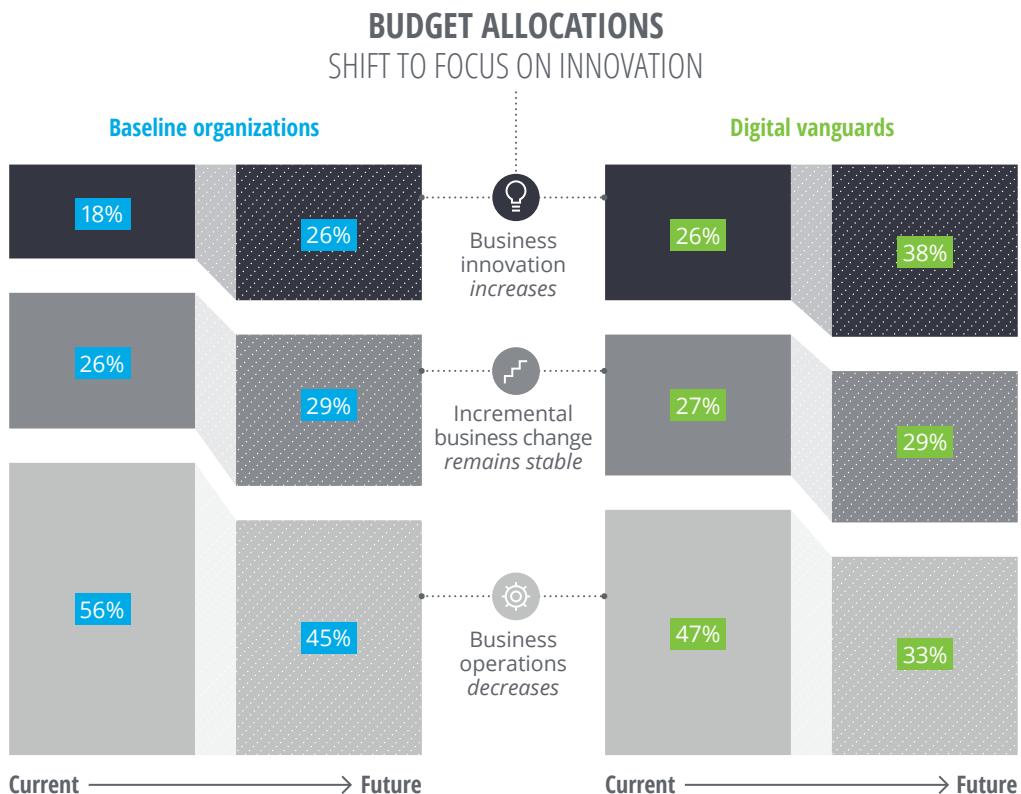
reducing operational costs to about one-third of the total budget, with the savings primarily going to innovation spending, which is expected to increase from 26 percent to 38 percent (see figure 14).

These gradual budget shifts can't be called truly transformative, though. What would it take to get there? The CIO's goal of a flexible IT delivery model will likely require iterative funding, a life-cycle view of budgeting that takes into account all costs over the technology's lifetime, and a mindset based on product rather than project. This fundamental shift in IT funding is in its early stages. For example, in our consulting work, we see some IT organizations shifting from annual, project-focused budgeting to continuous, capacity-based rolling budgeting. It's a start.

Forge forward

Many CIOs have the right intentions, but more is needed to compete and tell the value creation story. Many are burdened with antiquated investment processes and suffer from a dearth of supporting budgeting and forecasting skills. To truly revamp budgeting and funding processes and build governance structures that can enable and support such initiatives, CIOs will likely need to acquire the requisite skills and support in budgeting—and help ensure that consistent prioritization, measurement, and accountability are established for technology investments. Bottom line? There's a lot of work ahead.

CHAPTER FOUR

Transfuse talent and culture
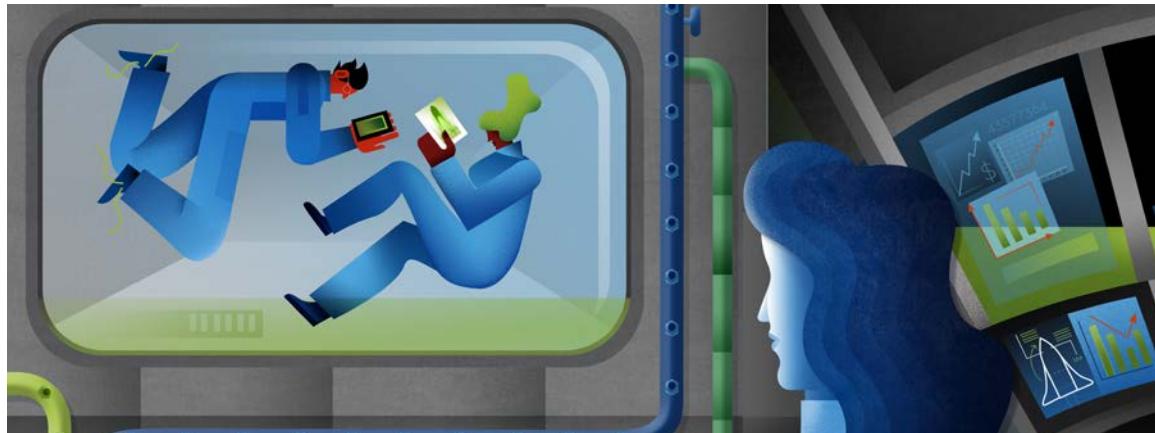
N RECENT DECADES, many IT workers became increasingly task-focused. Those with highly specific skill sets could typically work their entire careers within a single specialization. Managers were commonly motivated to develop the soft skills needed to effectively communicate and collaborate with the business, but many remained unprepared to take part in IT's expanded role.

That's generally changing, for a number of reasons. More and more IT tasks are being automated, and IT organizations are retiring many of the specialized skill sets on which careers were built. As IT's mission moves from "build and run" to "imagine, explore, architect, and design," a new spectrum of roles typically requires skills quite different than even just a few years ago. And the convergence of technology domains encourages the mastery of adjacent skills instead of deep silos of expertise. To close the talent gap, reimagining

IT talent and culture transfusion is required—refreshing traditional skills and rethinking old culture.

The convergence of technology domains encourages the mastery of adjacent skills instead of deep silos of expertise.

This could be good news for the IT workforce with the drive and ability to upskill their technical and interpersonal abilities. Granted, there will likely be fewer IT jobs: Survey data suggests that IT organizations will reduce the percentage of full-time employees from 82 to 75 percent of staff. But new roles are being created (for example, product managers), and those positions that do remain may turn out to be more satisfying and challenging, freeing up people to work with new technologies and business areas to deliver stronger business outcomes.[6]

"Twenty years ago, people branded themselves as SAP experts and even focused on a specific module, and that was going to be the focus of their entire IT career. Those days are gone. Today it's about technology athletes—people who are curious and are always looking to solve business problems through technology."

— *Wayne Shurts, EVP and CTO, Sysco Corporation*

Wanted: Technology athletes

Sysco Corp. CTO Wayne Shurts described today's IT talent as "technology athletes—people who are curious and always looking to solve business problems through technology." They have the intellectual and interpersonal strengths, flexibility, and drive to adapt and excel in environments of shifting business demands with an accelerating flow of new technologies.

CIOs are hardly new to talent shortages, but to support the business mandates for innovation/growth and business transformation, they're likely looking for a new combination of skills. Technical expertise—especially in new and emerging technologies—remains critical, but many savvy IT executives today see a growing need for augmenting that expertise with the soft skills needed to collaborate with the business.

FIGURE 15

CIOs are looking for IT talent with technical expertise in cyber, analytics, and emerging technologies

Which IT skills will be the most difficult to recruit for in the next three years?
(Please select all that apply)

Application design and development 17%

Cloud, SaaS, distributed systems 20%

Big data 33%

Innovation and emerging technologies 49%

Cyber, privacy, compliance 54%

Analytics, data science, business intelligence 64%
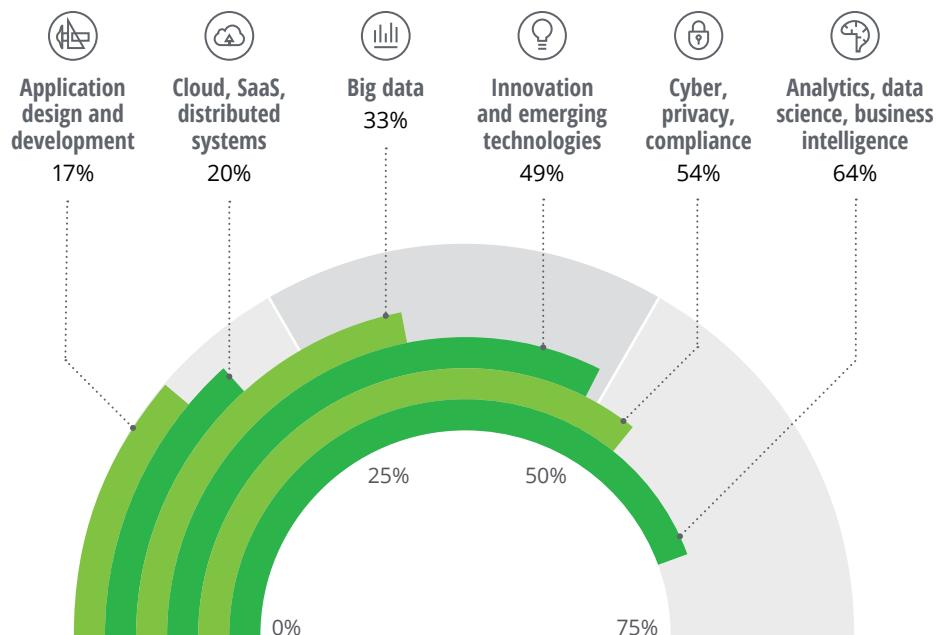
N=975.
Source: 2018 Deloitte global CIO survey.

When asked which IT technical skills will be most difficult to fill over the next three years (see figure 15), CIOs identified analytics and data science, followed by cyber and emerging technologies and innovation.

While many CIOs seek scarce technical expertise, they also need people with communication and interpersonal skills, which can be difficult to find in STEM-trained talent (see figure 16). As they make hiring decisions, CIOs surveyed expect three soft skills to be significantly more important than others:

- **Creativity.** IT talent will be needed to design products, services, and solutions that address business issues, develop engaging user experiences, think creatively to solve thorny business problems, and brainstorm innovative business ideas.

- **Cognitive flexibility.** Today, the half-life of a learned skill is five years.[7] For IT talent, the ability to see different perspectives, learn new skills, and adapt to change will be increasingly critical.

- **Emotional intelligence.** To effectively collaborate and influence people across multiple business functions, IT staff will need to manage interpersonal communication and relationships. Earlier research found IT leaders lacking in this ability, compared to leaders in other functions.[8]

Service orientation—a skill traditionally highly valued in IT—is the skill that CIOs surveyed expect to decrease the most in importance. Today, 65 percent of them hire for this skill, but only 52 percent expect to look for it in the future. Other traditional skills—including complex problem-solving, leadership, and critical thinking—will continue to be valued.

FIGURE 16

CIOs point to a growing need to augment technical expertise with soft skills required to collaborate with the business

What are the most important IT talent soft skills that you plan to hire for your team (currently and in three years)?

- Current skills ■ Skills in three years: Increase ■ Skills in three years: Decrease

RISING TECH SKILLS

	Current	Three years
Creativity	39%	61%
Cognitive flexibility	29%	52%
Emotional intelligence	34%	48%

Traditional tech skills

Complex problem-solving	61%	64%
Leadership/management	56%	60%
Critical thinking	46%	51%
Negotiation	26%	29%
Systems thinking	47%	51%
Service orientation	52%	65%

0%   75%

N=980.
Source: 2018 Deloitte global CIO survey.

In response to these changes, many CIOs are spending millions of dollars to revamp their workforces, employing multiple strategies to attain the needed skill sets. Fifty-eight percent report they are leveraging talent from external partners and service providers; the same percentage say they are retraining and retooling current talent. More than half (56 percent) are focused on hiring experienced talent, while only 36 percent report focusing on hiring fresh college graduates.

Breaking the culture code

The top IT workforce challenge is finding and hiring talent with the appropriate mix of technical and soft skills; 60 percent of survey respondents report difficulty finding this balance. Other common challenges are training for new skills and tools (52 percent) and managing and motivating the existing workforce (48 percent).

> "To reinvent our organization through technology, we need to ensure that our culture enables and promotes the reinvention of our IT talent as people and professionals. Otherwise, we cannot transform."
>
> — *Reginaldo Pereira da Silva, IT director, Thermo Fisher Scientific*

FIGURE 17

Organizational culture is fundamental in attracting and retaining top IT talent

Which of the following aspects of your organization's culture help attract and retain IT talent? (Please select all that apply)

■ Digital vanguards   ■ Baseline organizations

Opportunities to work with new and emerging technologies
81%
61%
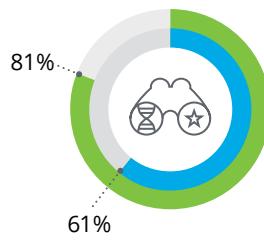
Fun, creative, inspiring environment
55%
43%

Organization is considered an innovative leader in IT
20%
50%
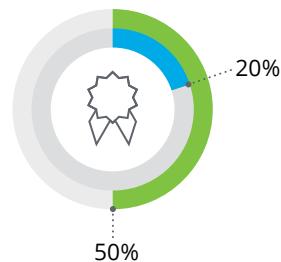
Flexible work arrangements including telecommuting
49% 45%
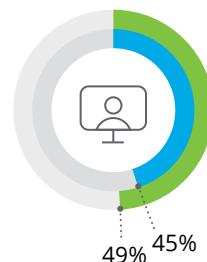
Our culture makes it difficult
9%
26%
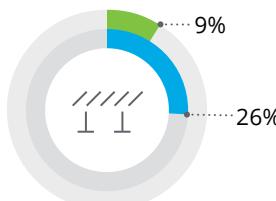
DIGITAL VANGUARDS BUILD ATTRACTIVE ORGANIZATION CULTURE TO ATTRACT AND RETAIN TOP TALENT

N=898.
Source: 2018 Deloitte global CIO survey.

Digital vanguards are betting on culture as a talent magnet. Only 9 percent see culture hindering their talent recruitment and retention initiatives, compared to more than a quarter of baseline organizations that see culture as an HR hurdle (see figure 17). They also credit opportunities to work with new and emerging technologies as the leading attribute that helps them attract and maintain talent (81 percent versus 61 percent of baseline organizations). Reputation is the most significant talent differentiator between digital vanguards and baseline organizations: Half of digital vanguard CIOs indicate that stature as a tech innovator helps them attract and retain talent, compared to only 20 percent of baseline organizations.

Salary and culture are important in attracting millennial talent, according to the 2018 Deloitte Global Millennial Survey, which found that their top job priorities are salary (63 percent), positive culture (52 percent), and a flexible work environment (50 percent).[9] "When looking to recruit and attract top IT talent, you can't have a policy to hire in the middle of the salary range," says George Conklin, SVP and CIO of CHRISTUS Health. "You also can't have a culture of resistance to change and fear of failure. Because then you also have to be OK with mediocrity and stagnancy."

Easier-to-replicate attributes, such as flexible work arrangements and a fun environment, are important but less of a differentiator for our respondents when it comes to attracting and retaining IT talent.

Future of work

CIOs need a sustainable talent strategy and can apply three recommendations from Deloitte's ongoing research on the future of work:[10]

- **Emphasize human-machine collaboration, not competition.** Look for opportunities to automate and augment existing IT work, beginning with areas that are currently more expensive and less productive.
- **Place strategic longer-term talent bets.** Identify the most important value chains that IT will support. Areas such as marketing, distribution, and customer experience often deliver a competitive advantage for companies; investments in IT talent to support these functions could generate a huge business impact.
- **Show how the business is engaged in a broader societal impact.** Millennials and Generation Z workers look for employers to play a positive role in addressing some of society's most pressing issues.[11] Highlighting the company's positive social impact can help attract young IT talent.

Building a winning team

In sports, coaches and general managers often take years to build a winning team. They seek to fill a diverse set of professional capabilities, interpersonal skills, and backgrounds. Likewise, a proficient team of technical athletes won't come together overnight.

CIOs can expect a transition period during which IT continues to rely on the deep knowledge of specialists as traditional technologies are modernized. Existing IT workers likely will require time and training to gain experience in the digital technologies that will drive the business future. And many IT staff will require new interpersonal skills to evolve from diligent order-takers to effective collaborators and business problem-solvers.

Meanwhile, CIOs should be on the lookout for a wide range of new talent—not just technical superstars but those workers who bring diverse backgrounds and skills and have the potential to become tomorrow's business cocreators and change instigators.

DIVERSITY AND INCLUSION MATTER

Many CIOs are investing in diversity and inclusion programs, recognizing that promoting diverse experiences and inclusiveness are key in winning the talent war. Eighty-seven percent of CIOs say they have an authentic commitment to diversity and inclusion, and more than half of US CIOs surveyed (58 percent) say they have formal initiatives in place to promote workplace diversity and inclusion (see figure 18).

Research has shown that diverse workforces with talented women, underrepresented minorities, and members of other underrepresented groups deliver better results.[12] For example, diverse companies are more likely to capture new markets and increase market share than nondiverse companies, and employees of diverse teams are more likely than others to take risks, challenge the status quo, and productize ideas.[13]

Cultivating diverse teams and leadership pipelines may also help CIOs battle the ongoing shortage of technical talent.[14] Millennial and Generation Z workers admire companies perceived as having diverse workforces and senior management.[15] Leveraging this appeal can help attract young digital natives who are comfortable with new and emerging technologies.

By promoting diverse experiences and inclusiveness, CIOs can gain an edge in attracting and retaining high-performing IT talent and building teams that can better enable their organizations to compete in the digital era.

FIGURE 18

CIOs are committed to fostering diversity and inclusion, but some still have work to do

The IT function has an authentic commitment to diversity and inclusion.

The IT function provides training programs that promote diversity and inclusion in the workplace.

Strongly agree — 52% / 18%
Somewhat agree — 35% / 40%
Neither agree nor disagree — 9% / 33%
Somewhat disagree — 3% / 6%
Strongly disagree

N=898.
Source: 2018 Deloitte global CIO survey.

SECTION THREE: LOOK BEYOND

C-suite executives often focus on the shiny side of digital: new technologies that can transform customer experiences, drive product innovation, and boost business performance. But these likely represent only the tip of the digital iceberg.

CIOs need to consider identifying and understanding what is below the surface. Core technologies serve as a foundation for a business's digital strategy. And a deliberate, systematic approach to innovation can enable the business to proactively harness disruptive capabilities.

CHAPTER FIVE

Strengthen the core
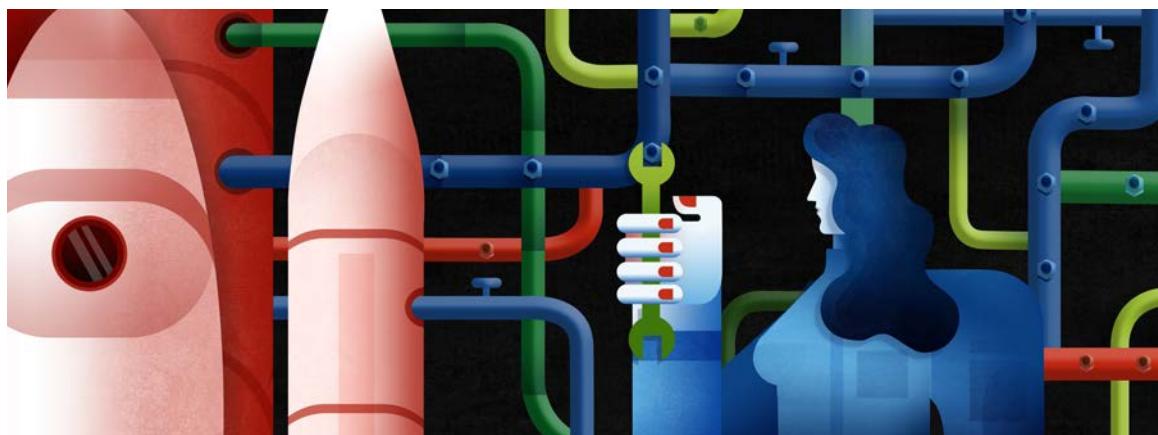
F YOU EXERCISE using weights, you've no doubt heard a trainer's advice to strengthen your core: Without a stable core, you can have trouble completing even one deadlift regardless of your leg and arm strength. The same can be said of digital and emerging capabilities—without a strong technology stack, they may struggle to reach their potential.

When we asked CIOs which technology areas will have the most impact on their businesses in the next three years, most selected front-end technologies:

2018 global CIO survey

SECTION THREE LOOK BEYOND

digital, data and analytics, and emerging technologies (see figure 19). But many also recognized that these initiatives should be built on a strong technology foundation that incorporates cyber, modernized legacy systems, and cloud computing.

Safety first

Cyber has generally become shorthand for security and privacy, topics that can discomfit even the most seasoned executives. Many organizations maintain a reactive stance to cyber; resources are focused on protection and prevention, realized through enforcement of compliance to standards, policies, and implementation patterns.

Yet many organizations still view security and data privacy as an operational expense (see figure 20). Only about half of those surveyed say their organizations treat security as a strategic investment that is needed to protect business-critical operations or personal information. Digital vanguards—perhaps because they are further along in their digital journey—are more likely than baseline organizations to view cyber as a strategic asset (57 percent versus 49 percent).

FIGURE 19

CIOs recognize the need to balance investments across front-end technologies and a core technology foundation to deliver impact

Which of the following technology areas will have the most impact on your business in the next three years? (Please rank your top three.)

CORE BUILDING BLOCKS

Cyber
48%

Legacy/core modernization
43%

Cloud
38%

FRONT-END TECHNOLOGIES

Digital
64%

Data and analytics
60%

Emerging technologies
40%

N=858.
Source: 2018 Deloitte global CIO survey.

33

SECTION THREE LOOK BEYOND
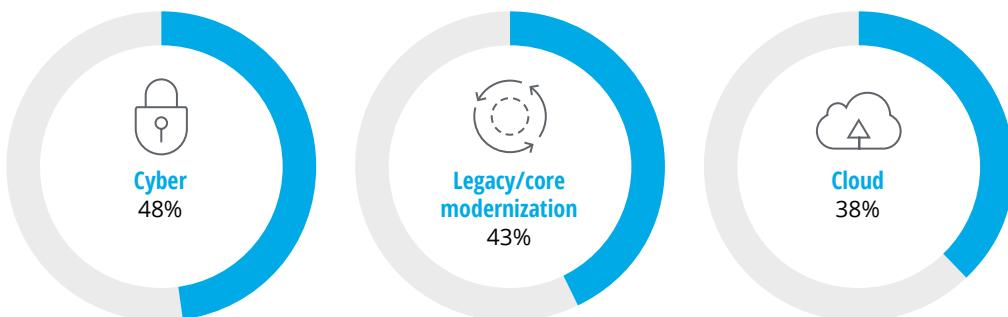
FIGURE 20

Baseline organizations continue to view cyber as a business cost, compared to digital vanguards, which view cyber as a strategic asset

How does the organization generally view security/privacy investments? (Please select all that apply.)

■ Digital vanguards ■ Baseline organizations

STRATEGIC INVESTMENT ⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯

Risk minimization for critical business operations
- 57%
- 49%

Protection of customer and personally identifiable info
- 52%
- 45%

OPERATIONAL EXPENSE ⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯

Compliance chore
- 28%
- 35%

Operational expense
- 23%
- 34%

Cost to the business
- 18%
- 28%

N=835.
Source: 2018 Deloitte global CIO survey.

However, this doesn't mean that organizations are turning a blind eye to security and the broader topic of risk; most CIOs (53 percent) report that cyber topics were discussed at their most recent meetings with the board. And 69 percent of respondents report having a very good or complete understanding of cyber-related changes and investments needed for digital initiatives. "It's hard to measure the value of cyber prevention," says Dave Naisby, CIO of the Commonwealth of Pennsylvania's Employment, Banking, and Revenue Delivery Center. "However, once you get people to recognize the potential consequences, they understand the need to invest in it."

A more strategic view is likely needed, evolving beyond cyber to involve other dimensions of "risk"— including regulatory and compliance, operational risk, financial risk, and even reputational risk. This last piece hints at an emerging topic of tech ethics

as well as the ongoing debate on the social impact, ethics, and morality of technology adoption.

Containing risk is no longer just an operational concern—it's a board-level business issue and strategic imperative for many organizations. Stakeholders at all levels should understand the opportunities and risks associated with digital initiatives. Leaders should proactively balance protecting the organization with adopting new business models and strategies.

Upgrade to a high-performance infrastructure

Many CIOs recognize that their legacy systems lack the agility needed to innovate and scale. Most (64 percent) are rolling out next-generation ERP or modernizing legacy platforms to address the

limitations of existing systems. "If you don't have high-performing infrastructure, then forget about projects and initiatives," says Mike Tartakovsky, CIO of the US National Institute of Allergy and Infectious Diseases. "No one will trust you without solid infrastructure—that's the core."

Compared to baseline organizations, fewer digital vanguards (47 percent) are focused on ERP, perhaps because they have completed foundational investments. Digital vanguards are also less likely than baseline organizations to be involved with supply chain and finance transformation (see figure 21).

Many CIOs are confident in their ability to drive legacy modernization efforts; 65 percent report a good or complete understanding of the changes and/or investments required. However, as enterprise leaders, CIOs should consider extending their understanding beyond implementation to applying the modernized infrastructure to support enterprise growth and business transformation.

> "To create a competitive edge, we're looking beyond our own four walls and working with our product teams to determine how analytics and other emerging technologies can be applied to new products and services for our end customers."
>
> — *Johnson Lai, CIO, NuVasive*

Embrace cloud

Business acceptance of all things cloud is likely a significant driver of digital transformation, and it's growing. Ninety percent of CIOs report that their organizations use cloud computing. This is just the beginning: They expect cloud investments will double as a percentage of IT spend over the next three years, leaping from 22 percent to 44 percent. Nearly one-third of CIOs (32 percent)

FIGURE 21

CIOs should consider moving beyond ERP implementations when looking at core modernization efforts

What are the primary focus areas of enterprise platforms within your organization?

■ Digital vanguards ■ Baseline organizations

ERP/package implementation

64%
47%
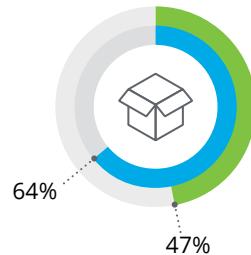
Global business services

27%
34%
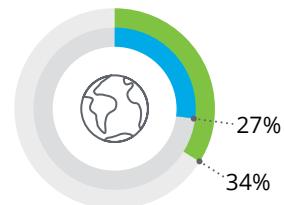
Digital supply networks

19%
23%

Digital finance

15%
19%
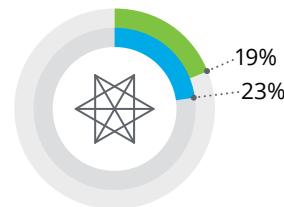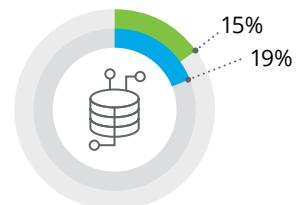
N=483.
Source: 2018 Deloitte global CIO survey.

report using cloud infrastructures for critical business applications.

Scalability (75 percent) and business agility (72 percent) remain the primary drivers for cloud adoption (see figure 22). While CIOs in past surveys expressed concern about protecting business data and operations in the cloud, their worries appear to be dissipating. Thirty-four percent of those surveyed now see cloud as a way to *enhance* security.

For many CIOs (44 percent), cost reduction is a primary motivation for cloud adoption. In one-on-one interviews, though, many CIOs cautioned that without appropriate governance processes to oversee enterprisewide cloud spending, total cost could actually increase. This is a real concern; according to our survey, only about one-fifth of CIOs say their organizations have structured processes for measuring the impact of technology investments.

Balancing act

To support digital, CIOs should consider balancing investments in both front-end and back-end systems. The business case for standalone back-end investments can be a hard sell, but increasingly, there is a common understanding that companies must invest in core technologies such as cyber, modernized core systems, and cloud to support their digital ambitions. As such, investments in these core technologies should not be viewed as standalone expenses but, rather, should be tightly and strategically integrated with investments in customer-facing digital technologies.

FIGURE 22

Cloud offers scalability and agility—but can lead to cloud sprawl

What are the primary reasons for using cloud technology? (Please select all that apply.)

Increase scalability	75%
Improve business agility	72%
Reduce cost	44%
Enhance security	34%
Shift funding from CapEx to OpEx	30%
Improve decision-making and functional efficiency	28%
Boost computing power	25%
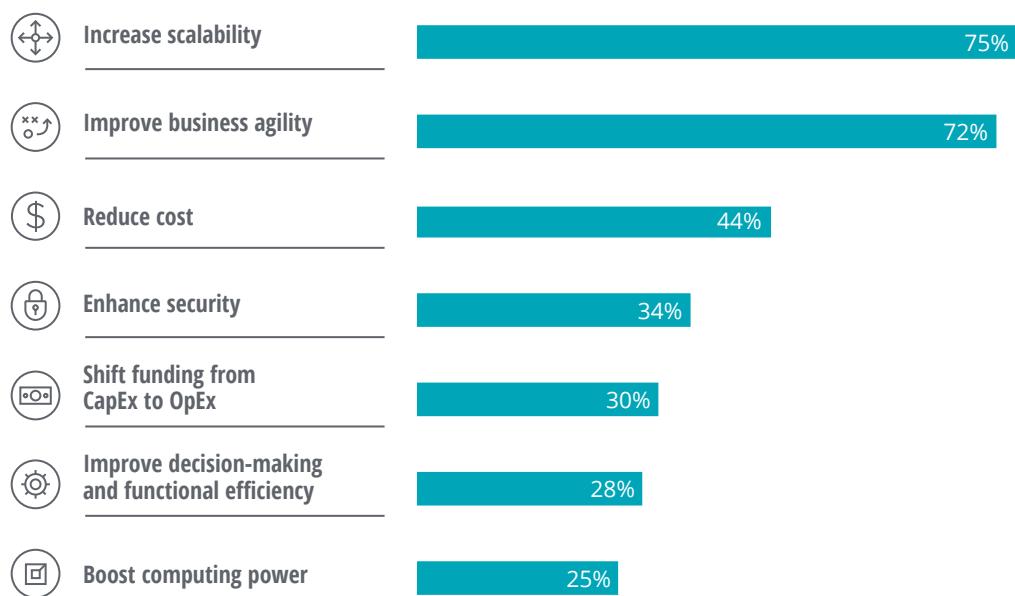
N=835.
Source: 2018 Deloitte global CIO survey.

CHAPTER SIX

Industrializing innovation

NEWTON SITS UNDERNEATH an apple tree. Archimedes soaks in a bath. Einstein daydreams at his patent office desk. History is spiced with *Eureka!* moments when human understanding leaps forward.

Thomas Edison chose a more deliberate approach: Rather than waiting for lightning to strike, he saw innovation as a replicable, continuous process. His facility in Menlo Park, New Jersey, was the first industrial lab specifically designed to produce a continuous stream of commercially viable technology innovations built on new and emerging technologies.[16]

Of course, the pace of technology innovation today—and its impact on business—is exponentially faster than in Edison's industrial age. But modern businesses can learn from the spirit of his model by approaching innovation as an ongoing operation designed to learn, prioritize, experiment, and scale technologies that can transform business and society.

Awaken imagination

Many CIOs are waking up to new digital technologies' potential impact on the enterprise. In 2016, only 17 percent of CIOs expected emerging technologies to have a major impact on their businesses within three years; that number has more than doubled to 40 percent (see figure 23). They expect to make substantial investments in artificial intelligence (AI), machine learning, Internet of Things, and robotic process automation. CIOs in digital vanguard organizations plan to pursue AI and machine learning far more aggressively than

"IT has to innovate or die. Technology is moving at warp speed while humans move in a more linear fashion, so innovation is key. And to innovate well, we have to think about business through a digital lens."

— *Sara Mathew, board member, Campbell Soup Company*

those in baseline organizations, perhaps because they have a solid foundation that allows them to increase the impact of these emerging technologies (see figure 24).

But how can CIOs help ensure that these technology bets will generate the return on investment expected by the business? And how can they stay ahead of the ever-accelerating stream of new technologies?

How to build a better lightbulb

Many organizations are pursuing innovation with a shotgun: dabbling in emerging technologies without thinking through use cases and scalability, spreading investments across multiple startups without a broad strategy, or relying too heavily on their traditional ecosystem of partners and vendors for guidance. Few—if any—have implemented a disciplined, end-to-end innovation program that

FIGURE 23

CIOs are focused on emerging technologies as a key to delivering future business impact

Which of the following technology areas will have the most impact on your business in the next three years? (Please rank your top three.)

CORE BUILDING BLOCKS

Cyber
48%

Legacy/core modernization
43%

Cloud
38%

FRONT-END TECHNOLOGIES

Digital
64%

Data and analytics
60%

Emerging technologies
40%

135%
INCREASE FOR EMERGING TECHNOLOGIES OVER THE 2016 SURVEY—FROM **17%** TO **40%**
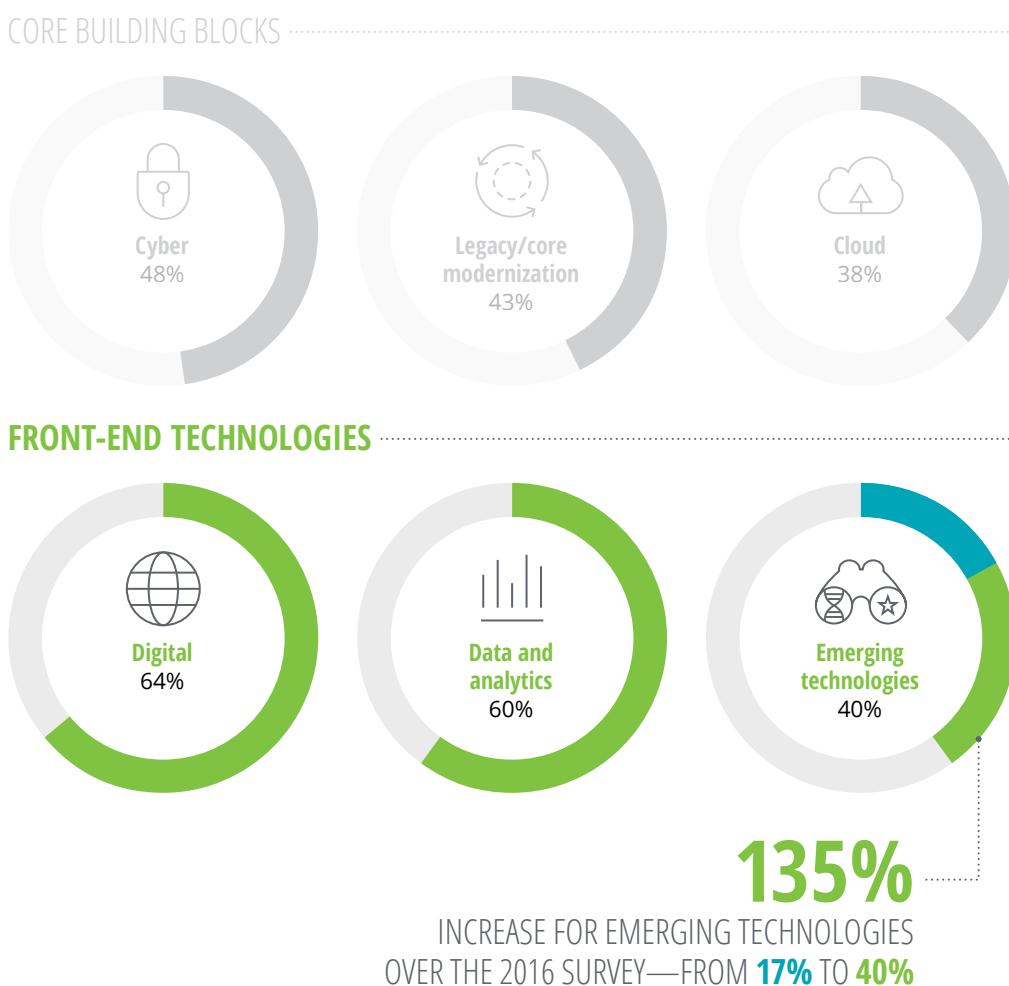
N=858.
Source: 2018 Deloitte global CIO survey.

generates an ongoing stream of new potential technologies and use cases with meaningful business context that can scale across the enterprise.

A formal program that brings in other parties can show real results. "Engaging constructively in a win-win way with ecosystem partners is critical and is going to continue to translate into real competitive advantages for our organization," says Blackrock Closed-End Mutual Funds board member Catherine Lynch.

Answering the following questions can help CIOs create a deliberate, repeatable, and scalable innovation process across four dimensions:

- **Sense, scout, and scan: What's happening?** Develop a broad awareness of technology advances in the marketplace, and identify important players. Look beyond traditional industry boundaries to identify ideas and perspectives; keep an eye out for potential

FIGURE 24

AI, Internet of Things (IoT), and robotic process automation (RPA) are at the top of CIOs' emerging technologies wish list

Which of the following emerging technologies do you anticipate investing in significantly in the next three years? (Please select up to three.)
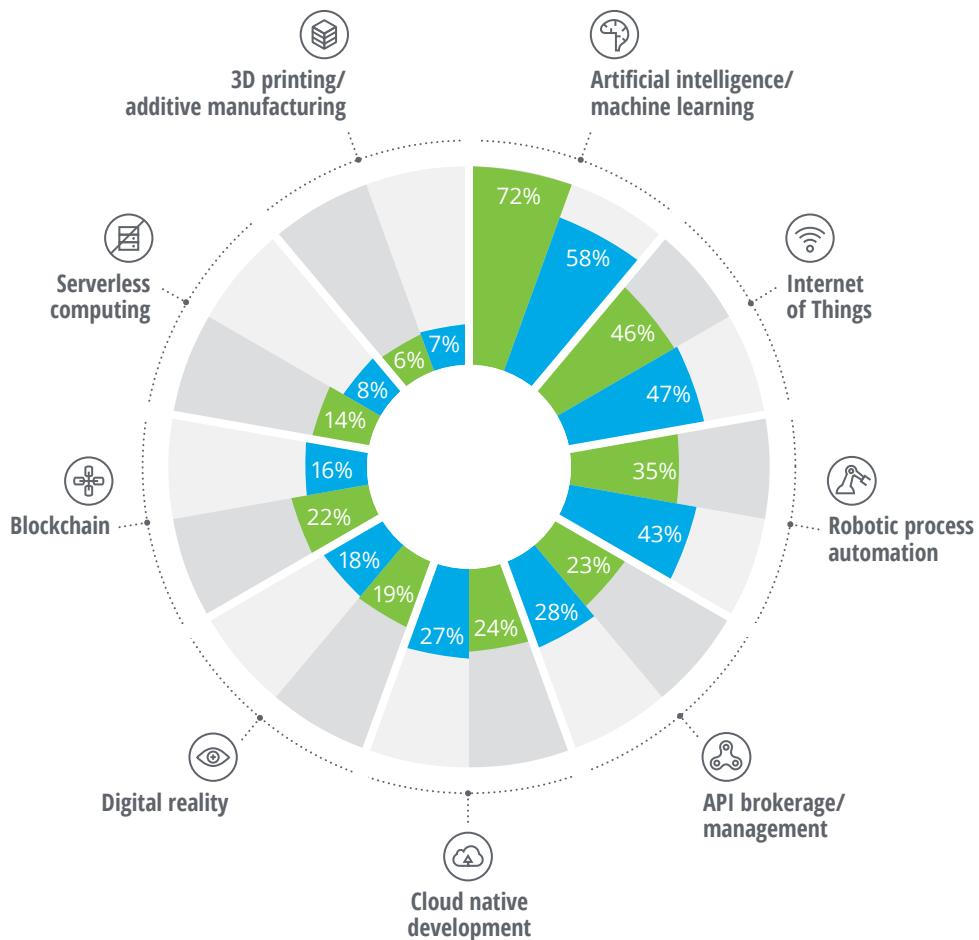
N=803.
Source: 2018 Deloitte global CIO survey.

competition in adjacent domains. Follow current developments in grants and patents, government research, acquisitions, and venture equity.

- **Research: What's possible?** Sort out technologies that could translate into potential business opportunities. Uncover what others are doing, both within and beyond your industry. Discuss ideas—big and small—for applying these technologies to launch new offerings, enhance competitiveness, reduce cost, and/or improve efficiencies for your enterprise. Understand the viability of particular solutions in your business environment, and identify stakeholders that could sponsor an initiative.
- **Explore: What's valuable?** Develop potential business use cases. Prioritize ideas that are worth moving into the experimentation stage and build initial prototypes. If the business case fulfills expectations, you may have found a winning innovation. At this stage, strong governance is needed to weed out ideas that are out of sync with corporate/digital strategy—and to define appropriate stakeholder alignment, accountabilities, and success measures.
- **Experiment: What's viable?** Time to roll up your sleeves. Move beyond concept proving and into real-world prototypes. Rapid iteration can help teams efficiently determine what's feasible in the real world. What challenges will need to be overcome? What's the value proposition beyond the original conceit? What will it take to scale at an enterprise level? (See figure 25.)

Even with a solid business case and encouraging experiments, the innovation likely will need to be thoroughly tested and shown to be scalable. Some companies have established innovation centers separate from the core business and staffed with dedicated talent with incubation and scaling expertise. These centers can reduce enterprise risk by enhancing, testing, and solidifying the concept before moving the innovation into production. Others are using innovation hubs and corporate-backed venture outposts to sense, scan, research, and explore potential ideas. "We are moving to a world where we need to

FIGURE 25

Few CIOs have implemented a deliberate, end-to-end process to demonstrate the impact of technology-led innovation

What is IT's role in the innovation, adoption, and exploration of emerging technologies?

Experiment
26%

Sense
and scan
13%

Explore
50%

Research
11%
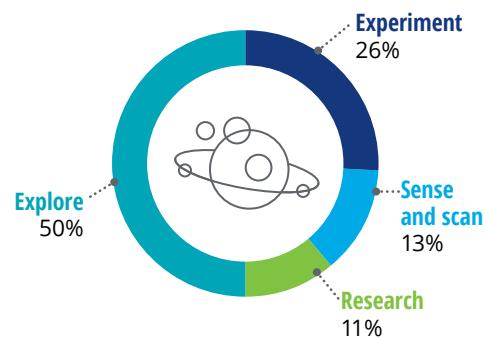
N=809.
Source: 2018 Deloitte global CIO survey.

maximize the velocity of responding to emerging changes and trends," says former Commonwealth Bank of Australia CIO David Whiteing. "And in this world, experiments are more important than expertise. It's not easy to predict and make bets on emerging technologies, but iterative experimentation, a good model for interpreting market signals, and the ability to anticipate where things are going can help organizations pivot and change."

As companies embark on building this new capability, a consistent, well-structured process can facilitate the flow of ideas and experimentation while encouraging the applicability, scalability, and alignment with business strategy. Otherwise, allowing innovation and ideas to thrive in ad hoc environments and individual business silos can lead to chaos and make prioritization, funding, and governance more challenging.

Are you prepared to make your mark?

So where do CIOs fit into this vision of deliberate technology-driven innovation?

In many ways, business leaders already hold high expectations for IT to lead the way forward. CIOs of baseline organizations report that business leaders expect IT to understand market trends (72 percent), determine business use cases (62 percent), develop prototypes (48 percent), and identify ecosystem partners and vendors (46 percent). Business expectations for digital vanguards were only slightly higher (see figure 26).

This is where a well-prepared CIO can step up as a business partner and cocreator to inspire, envision, and rationalize digital innovation. Effective innovation leaders will likely have already done the hard work to prepare for this opportunity by:

- Developing the personal attributes and capabilities needed to shape the future of the business;
- Earning credibility with business peers as a technology interpreter, influencer, and visionary;
- Transforming IT's delivery model to be agile, responsive, and directly connected to business outcomes;
- Attracting and developing IT talent with the intellect, interpersonal skills, cognitive flexibility, and drive required to excel in an environment of shifting business demands and an accelerating flow of new technologies; and
- Investing in core systems that protect, support, and flex to manifest the business's digital ambitions for years—perhaps decades—to come.

These CIOs are likely ready to initiate—and perhaps lead—the creation of a deliberate approach to bring ongoing innovation into the enterprise and marketplace. Industrializing the innovation process can help CIOs manifest their legacies as business cocreators and change instigators who create hype-free environments where IT teams can test, experiment, and demonstrate value, ultimately enabling enterprises to leverage technology to create business value. Don't delay; others have already begun looking beyond the current digital era to manifest their CIO legacy.

FIGURE 26

Business leaders have high expectations of IT to explore emerging technologies, particularly with regard to sensing and researching

What is the business expectation of IT in exploring new and emerging technologies? (Please select all that apply.)

■ Digital vanguards ■ Baseline organizations

Understand marketplace trends and disruptions
78%
72%
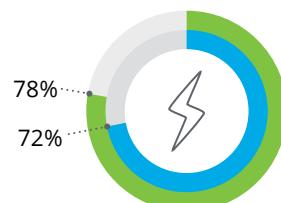
Determine business use cases
62%
63%
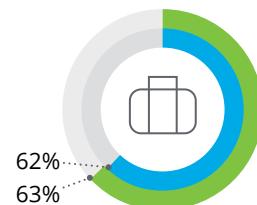
Develop prototypes
48%
54%
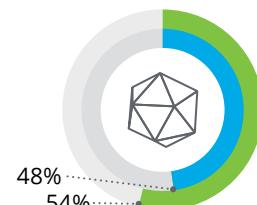
Determine ecosystem partners and vendors
46%
49%
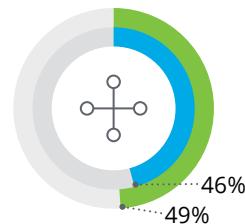
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About this research

This report is the third and final report in the CIO Legacy Project. This research was conducted from January to March 2018 across 71 countries with an aim to better understand the impact and legacy of the CIO role. The research was conducted through in-depth interviews and online surveys. Globally, 1,437 technology and business leaders participated in this research across 23 industry segments. For industry segments, we collected the data at the detailed industry and sector level and aggregated it back to the six major industry categories for easier analysis and for statistical significance. We used advanced analytics techniques, including clustering analysis, as well as descriptive and predictive analysis, and sifted through thousands of permutations of data by looking at cross tabs and variances. We used clustering analysis to segment the respondent population into three CIO patterns and two types of organizations, exploring the differentiating behaviors of each.

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