



Innovation Index:

**Digital Strategies for an Era of
Constant Disruption**



OXFORD
ECONOMICS

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Trusted Global Innovator

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Introducing the Innovation Index

Disruption overload and transformation fatigue have remained constant through yet another year. Continued uncertainty around the global pandemic, combined with social unrest, natural disasters, supply chain challenges, workforce shortages, and cybersecurity attacks, forces leaders to constantly revisit — or even remake — their strategic plans.

While we cannot yet bring total clarity to the road ahead, our first annual Innovation Index explores how North American organizations are prioritizing and valuing their digital investments to remake operations and strategy in the wake of constant disruption.

The opportunities and obstacles of the digital age will continue to grow. Though traditional goals like customer satisfaction and financial performance remain top organizational priorities, they demand new approaches to bring success.

Consumer and employee expectations are now changing in a matter of days, rather than years, as evolving digital technology and the ongoing pandemic reshape behaviors. And competitive disruption has accelerated, pressing leaders to act and respond differently against this tumultuous backdrop. Success will come to those able to quickly predict outcomes, inspire their organization and stakeholders,

and adjust their processes to address unrelenting upheaval.

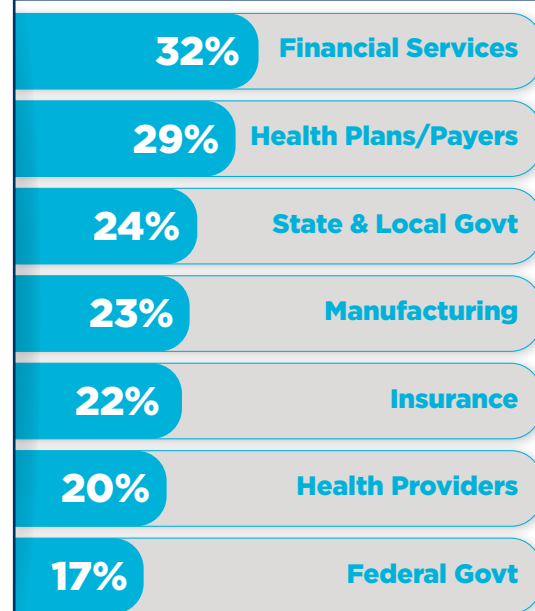
In the face of this disruption, one familiar constant remains: technology. Digital tools continue to advance and remake how our world operates. Investment in both foundational and emerging technology is still what provides organizations an opportunity to survive and thrive in the future.

The research, conducted by NTT DATA and Oxford Economics, includes a survey of 1,000 business and IT executives in Q2 and Q3 of 2021. Roughly a year and a half after the onset of the COVID-19 pandemic, only 23% of respondents felt highly prepared to meet the challenges of disruption from things like health crises and natural disasters. In addition, more than half of leaders still view their organization's innovation as reactive rather than proactive. This reactivity could be attributed to a slow and cautious response to a once-in-a-lifetime event, but a risk-averse attitude impeding innovation can have unintended consequences.

The data, collected across 16 industries, revealed mission-critical organizational priorities: building confidence in data-driven decision-making, fostering loyalty of customers and employees, and creating performance improvements that drive process efficiencies — all of which lead to desired and valued outcomes.

The opportunities and obstacles of the digital age will continue to grow.

How prepared are industries to deal with change related to health crises and natural disasters over the next two years?



"Highly prepared" responses.

Business and IT leaders across industry sectors must make decisions now about where to focus attention and investments to determine their futures.

Key themes

The following themes emerged from our research:

- **The human element may be the most important and overlooked barrier to successful digital transformation.** Improving employee engagement and retention is not a priority — just 16% of respondents say this is a top focus area, and even fewer report employee demand as a driver for organizational strategy.
- **Foundational technologies are yielding results, and expectations are high for established tech.** Adoption rates of digital solutions like customer relationship management (CRM), cybersecurity and cloud far outpace investments in predictive analytics, conversational artificial intelligence (AI), machine learning, and other emerging technologies. But when examining expected value, executives expect the latter to help improve financial performance, increase customer satisfaction, reduce risk, and achieve other organizational benefits.
- **Data drives decision making in a digital economy, but management of this valuable resource falls short.** More than half of respondents have not yet mastered using data to inform decisions, and nearly half are not confident in their ability to prevent security breaches. In fact, just 44% indicated they have governance plans in place to support innovation.
- **Culture and innovation are critical for success, but organizations could do more.** Roughly one-third claim to effectively provide a sense of organizational purpose, and just one-fourth have successfully developed an innovation-focused culture.
- **Many are still struggling to adapt to constant digital disruption.** Despite half of respondents saying the pace of technology change will have a positive impact on their operations, only 40% are highly prepared to meet those challenges. Even more alarming is nearly half of respondents still view innovation as “nice to have” rather than critical to their survival.

Business and IT leaders across industry sectors must make decisions now about where to focus attention and investments to determine their futures. Knowing how industry peers are addressing the challenges uncovered in this research — and how the top performers are achieving positive outcomes — provides an important roadmap for the years ahead. This foresight is of the greatest importance, as the ramifications of even one strategic misstep have never felt more treacherous.



There is no “new normal”





This uncertainty should be forcing changes in strategy, yet most executives say they are unprepared for the enormous challenges at hand.

Disruptive change — from technology to policy and regulations — has been an inescapable theme for organizations of all kinds over the past two years. Prior to the pandemic, disruption was commonly found in the form of nimble start-ups unburdened by technical debt and innovative industry-crossover organizations with digital-first business models. But now it is coming from all angles, and an analysis of our survey results demonstrates the magnitude of pressure facing organizations.

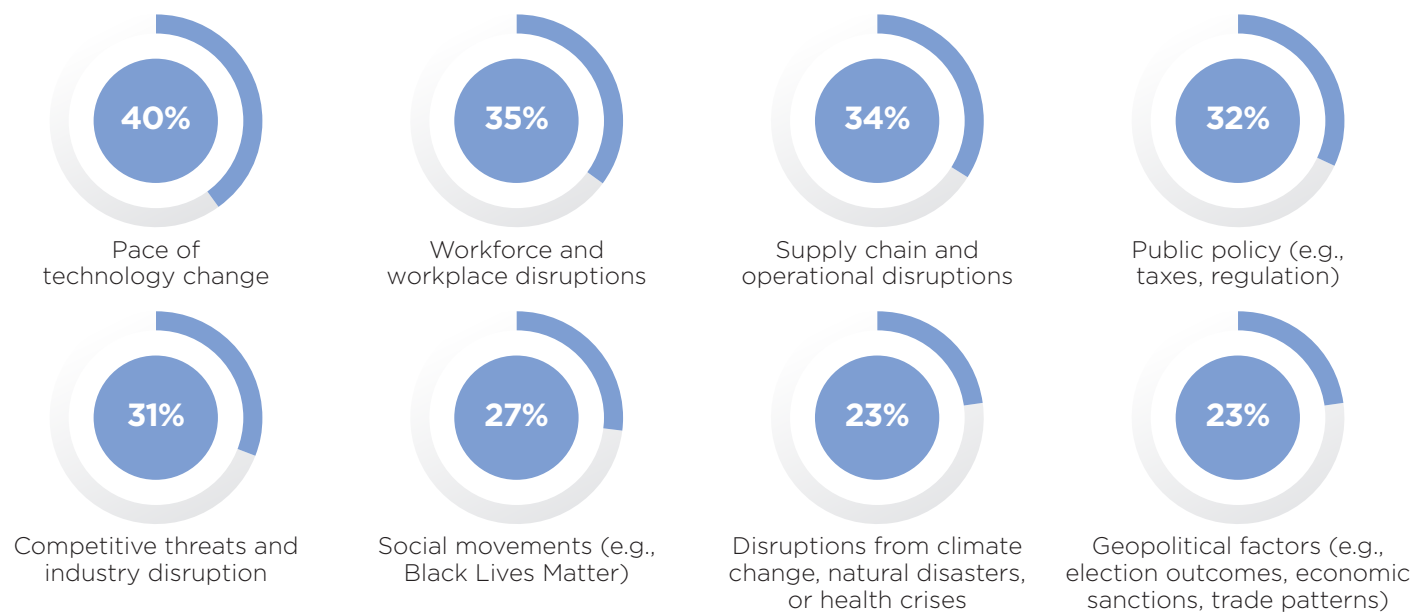
Although competitive threats and industry disruption still weigh on the minds of business and IT executives (48%), our research indicates external factors beyond market competition will now significantly affect organizational

operations in the next two years. Negative operational and performance impacts caused by climate change, natural disasters, or health crises disruptions are top of mind for 61% of our respondents, while 43% are also concerned over supply chain and operational disruptions.

This uncertainty should be forcing changes in strategy, yet most executives say they are unprepared for the enormous challenges at hand. Increasing customer satisfaction, improving financial performance, and increasing process efficiency top the list of organizational goals, but just one-third are preparing for disruption by increasing agility. Without the ability to combat continued disruption, those goals become much more difficult to achieve.

Fig. 1: Underprepared for tomorrow's challenges

How prepared is your organization to deal with change related to the following factors over the next two years? Three point scale; "Highly prepared" responses only





Most executives are not yet adjusting plans and expectations to navigate current industry and market conditions — or to capitalize on the opportunities they create. Despite the fact that more than half of respondents indicate strategic planning has become increasingly long-term, there is a disconnect between what executives know they need to do and what they are actually doing.

Over half also say the pace of technology change will have a positive impact on their performance and operations, but only 40% are highly prepared for this challenge. And there is a surprising ambivalence toward innovation, with less than half of respondents saying innovation is supported by IT infrastructure, business models, employee skills, or cultures.

And while nearly half of respondents say workforce and workplace disruptions will present major problems, just one-third claim to be highly prepared for these changes. Interestingly, a stunningly low 16% list improving employee engagement and retention as a top priority for the next two years, with just 5% saying strategic or operational changes are driven by employee demand.

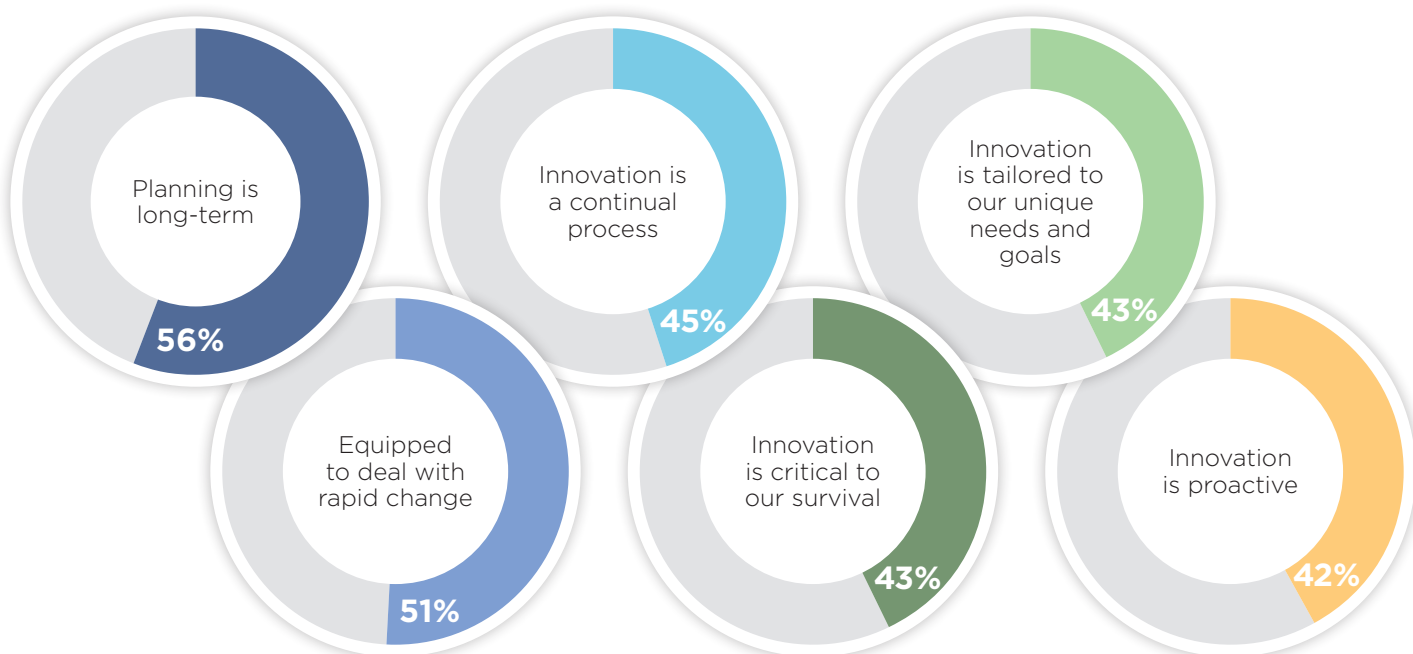
Clearly, there is no “new normal,” but rather changing patterns and pressures that are creating fresh waves of technology-focused disruption. Meanwhile, executives have yet to marry the concepts of strategy, planning, and execution that will allow them to achieve their goals. Solving these problems to prepare for what comes next is critical, and

Clearly, there is no “new normal,” but rather changing patterns and pressures that are creating fresh waves of technology-focused disruption.

the following sections of our Innovation Index explore priorities and best practices to combat constant digital disruption.

Fig. 2: Long-term planning comes at the expense of innovation efforts

Which of the following statements most accurately describes your organization?



**Human experiences
determine digital outcomes**





Nearly 60% of our respondents say customer wants and needs are changing too quickly to provide high-quality experiences. Meanwhile, just 39% consider digital experiences to be critical to satisfaction and loyalty.

Customer satisfaction remains elusive

The old adage, “the customer is always right,” has never been truer. When the competition is one click away and new rivals are banging at the door, keeping customers happy and engaged is paramount. Even industries previously unaffected by customer whims, such as the public sector and healthcare, are feeling this burden, too, as “prime” customer experiences have altered expectations for all interactions.

It makes sense, then, that two-thirds of the executives we surveyed say increasing customer satisfaction is a top goal over the next three years, and the demands of customers (or constituents and patients) are a primary driver of strategic and operational change.

But building customer loyalty is not getting any easier in a world of constant transformation. Nearly 60% of our respondents say customer wants and needs are changing too quickly to provide high-quality experiences. Meanwhile, just 39% consider digital experiences to be critical to satisfaction and loyalty.

Nearly one-third of respondents say a growing unwillingness by customers to share their information is a challenge to effective data use, which could derail efforts to provide the personalized experiences that those same customers crave. While personalized experiences are increasingly considered critical to strengthening the bond with customers, the survey revealed strategy and execution have not caught up with reality. Less than one-third of respondents say delivering personalized products or experiences is a primary component of customer satisfaction and loyalty, and just 18% say the same about customer relationships with the brand.

Successful organizations, however, are using technology to meet customer loyalty challenges. The small group of respondents that outpace all others (see “Meet the Leaders,” page 17) have moved ahead of their peers by focusing on customer and employee experiences, adept implementation of technology, and sound data practices. As a result, these leading organizations report substantially higher rates of customer, patient, or constituent satisfaction — and see greater financial benefits, too.



Employees, an afterthought

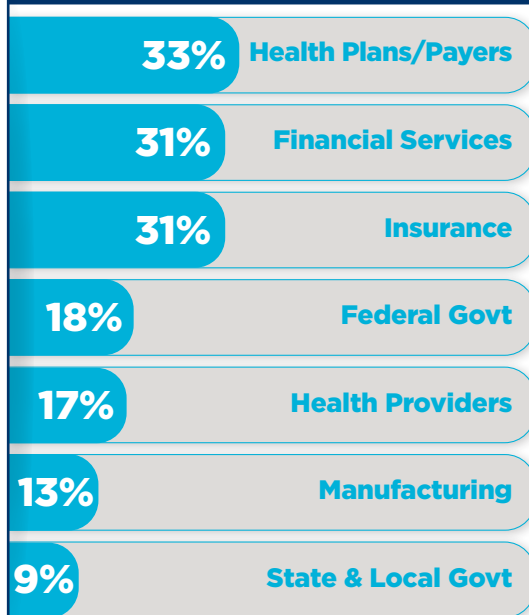
As critical as the customer experience is to business outcomes, our research shows that employee experiences should demand attention as well. But these two groups are far from being equivalent for most executives, which may explain the much reported “Great Resignation,” a critical issue facing many industries today.

Flexible work is here to stay, but our research reveals that few are prepared for this shift, with just a little more than a third saying they are highly prepared to deal with workforce and workplace disruption. Even after a tumultuous couple of years, just 28% say they are highly effective at providing flexible work options. Remote work is not for everyone or for all positions. However,

with an increasingly global and distributed workforce, talent shortages, and the rise of the gig economy, organizations cannot afford to remain complacent when it comes to talent retention and employee needs.

Even more worrisome is that barely one out of five respondents believe that providing flexible work options is of top importance to employee satisfaction and engagement, and nearly half say rigid processes do not allow for flexible or remote working. Organizations will need to find ways to turn the new work environment — including culture and digital workplace technology enhancements — to their advantage, or the results will not be pretty.

Does your organization consider providing flexible work options a top important factor to employee satisfaction and engagement?



How a culture of innovation can help

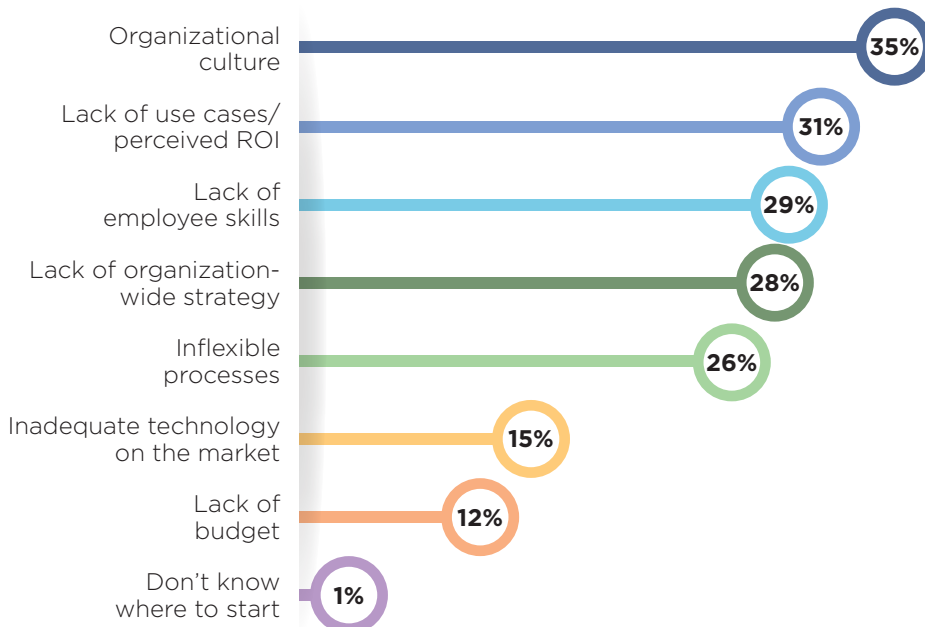
It seems logical that building a workplace where employees feel their needs are met would influence positive employee experiences, but many executives have not gotten the message. One-third of respondents say culture is not a primary component of employee satisfaction, and only about 40% say effective communication and a strong organizational purpose are among the most important elements of employee satisfaction and engagement.

Nearly half of respondents believe the culture and management they provide are positive, but few have actually taken steps to ensure a positive environment exists. Only about a third claim to effectively provide a sense of organizational purpose, and just one-fourth have successfully developed an innovation-focused culture that is above average for their industry.

Lack of culture trickles down to employee retention and skills, which are essential to successful outcomes in everything from technology adoption and performance to innovation and customer service. The needs here are pressing. But nearly one-third of respondents say a lack of employee skills limits the value of their investments in digital technologies, and one out of six say a lack of employees with needed analysis skills is holding back their data use.

Fig. 3: Poor culture detrimental to change

Which of the following hold back your investment in digital technologies? Select all that apply



Executives also see a disconnect between their workforce and their strategic aims, with nearly half saying employee skills have no impact on innovation efforts — and 11% even saying employee skills are detrimental to innovation efforts. This is not

a healthy situation for fostering growth, either for employees or organizations. And when just 16% identify employee engagement and retention as a priority and only 5% claim employee demand factors into strategic and operational decision-making, it is clear this critical group is not considered an asset to help drive innovation and combat disruption.

Just 16% of executives identified employee engagement and retention as a top priority

Organizations will have to turn the situation around to create an inclusive work culture and adopt a human-centric design that fosters productivity and elevates employee experience, while providing workspaces that bring out the best in their employees.

Driving performance with digital technology





The building blocks of transformation

Technology is the engine of transformation. Several decades into the digital era, the tools and applications are too diverse in function and maturity to fit comfortably into a single category; instead, they map to almost every part of an organization and its future plans.

Most respondents have made or are making significant investments in what we think of as foundational, table-stakes technologies — those tools needed to operate efficiently today. Nearly three-quarters of respondents, for example, are using technologies like enterprise resource planning (ERP) and CRM systems in at least some functions. Those investments are paying off, with half of respondents reporting improved financial performance, growth, and return on investment (ROI), and nearly three-quarters reporting customer satisfaction gains.

Cloud, too, has become a foundational technology, with organizations investing almost equally in public (58%) and private (56%) clouds, and nearly two-thirds saying this has delivered financial performance gains. Respondents are also banking heavily on private cloud, with 79% expecting it to help them reduce risks and prepare for disruptions.

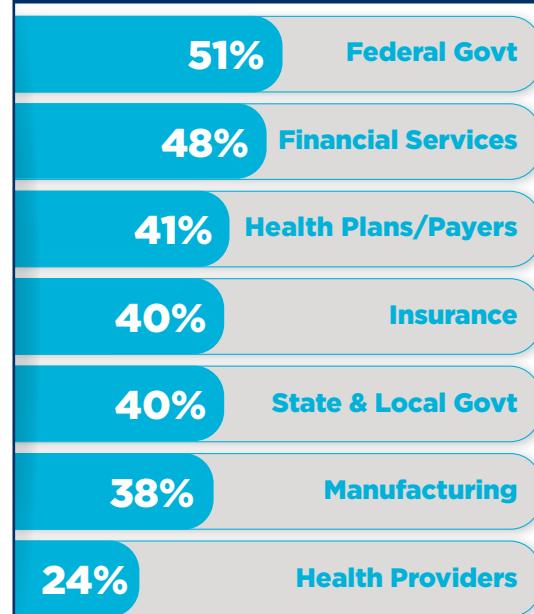
These well-established technologies lay the groundwork for established and emerging technologies that may influence the future, many of which are already well on their implementation journey. For example, in the case of customer experience and loyalty, CRM is already helping organizations improve customer satisfaction, and conversational AI and virtual assistants are expected to continue and escalate this trend.

One-third of organizations are beginning to use AI-driven conversational interfaces and virtual agents for customer-facing processes, with impressive early results: 80% say they have seen an uptick in customer satisfaction. AI-based tools are also driving customer engagement and internal efficiency, and the largest benefits appear in dollars and cents; well over half of respondents have implemented AI in at least some areas, with two-thirds citing financial performance gains from their use of this technology.

Predictive data analytics is starting to gain a foothold, with 41% having implemented it in at least some areas. Nearly 60% of that group has seen a boost in financial performance, but extracting value from data remains elusive for many respondents (see “Value-added solutions”, pg. 15).

Organizations are relying on these technologies to survive uncertain times by reducing operational risks and leveraging digital tools to achieve a wide array of benefits that help meet overarching business goals.

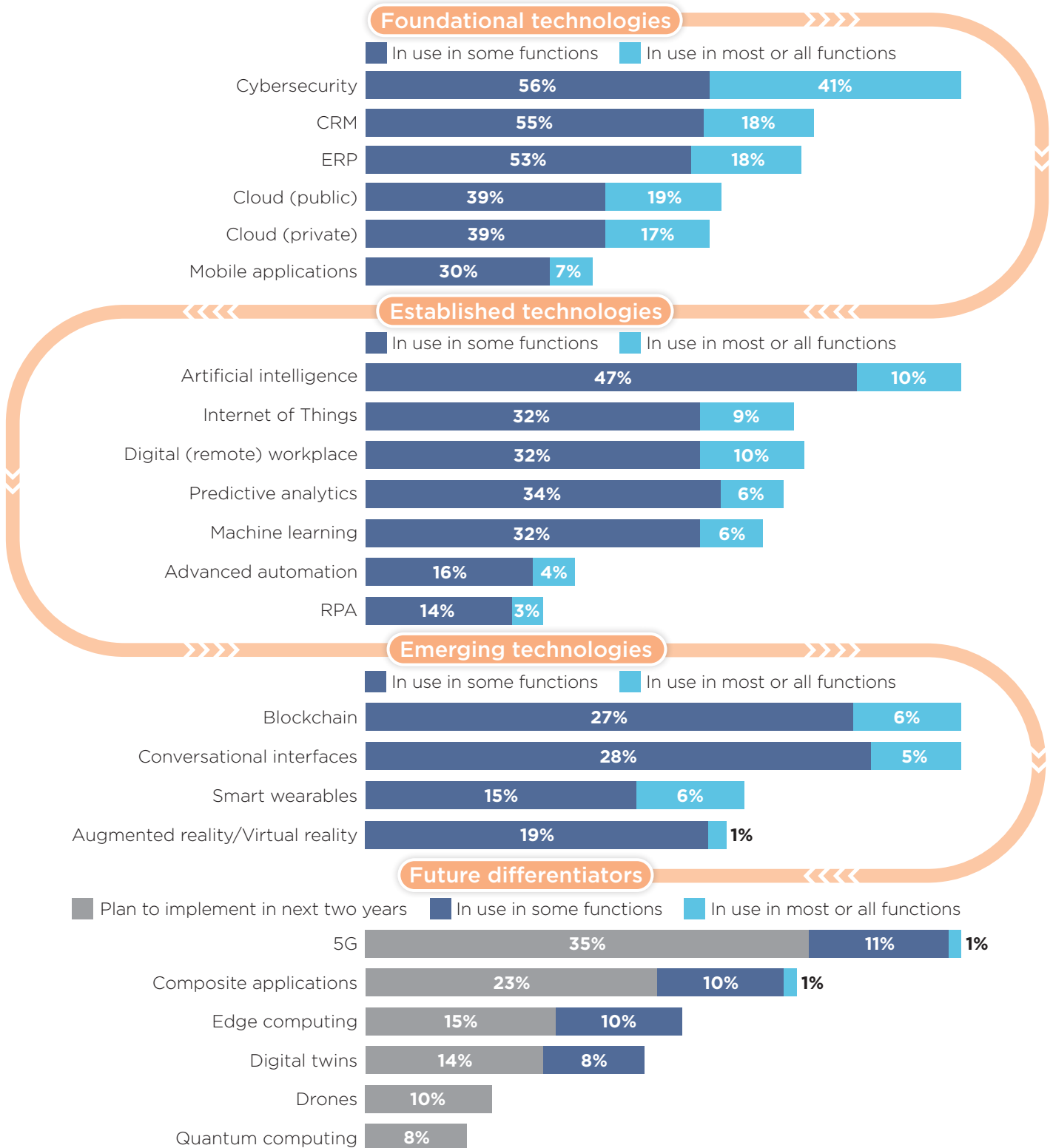
Has your organization implemented predictive analytics?



“In use in some functions” or “In use in most or all functions” responses only

Fig. 4: The technology adoption curve

Has your organization implemented any of the following technologies?



Value-added solutions

Despite the growing opportunity, many executives struggle to justify spending on AI-related tools and other emerging technologies in their own organizations. One-third of respondents say investments

have been hampered by lack of use cases or perceived ROI. The question becomes, are leaders getting returns on their investments?

We asked executives to identify expected outcomes as a result of their investments in foundational and emerging technologies, and the results indicate each solution is being used to achieve different goals:



Improving Financial Performance

The most desired outcome for most respondents is expected from investments in public cloud, advanced automation, and AI. However, financial performance was also one of the top two outcomes expected from seven of the foundational and established technologies, including cybersecurity, private cloud, predictive analytics, and IoT.



Increasing Customer Satisfaction

Although most executives feel customer wants and needs are changing too quickly for their organization to keep up, they are confident their investments in CRM, conversational AI, and mobile applications will deliver better experiences. In addition to these three, customer satisfaction is also one of the top two expected outcomes of implementing private cloud.



Reducing Risk

Cybersecurity, public cloud, and workplace technologies were the most identified solutions to minimize potential disruption from bad actors and safeguard new ways of working. Executives are also relying on machine learning, robotic process automation (RPA), ERP, and predictive analytics to keep them safe.



Boosting Employee Loyalty

Executives have a long way to go to create culture-rich work environments and are placing their confidence in digital workplace technologies, conversational AI, and ERP systems to help drive results.



Surviving Threats

Machine learning, RPA, and advanced automation are helping organizations withstand digital disruption and thwart challenges from competitors. Perhaps indicative of the reactive view of innovation for respondents, survival was one of the top two driving factors behind the adoption of AI, mobile apps, and IoT as well.



Providing Societal Benefits

Executives indicated IoT, cybersecurity, and RPA are the technologies they believe will most help solve challenges facing our society. However, the majority of organizations are not yet associating societal benefits with these solutions since it was not identified as a top outcome for any of the foundational or established technologies.

Emerging tech is not yet on the radar

Despite the benefits digital technologies are providing, our research shows organizations are not yet investing heavily in emerging technologies or technologies that have the potential to become future differentiators. Some of this can be attributed to the maturity of particular tools, but executives generally seem cautious about making the wrong bets in an uncertain environment.

Two-thirds of early adopters of edge computing say they have seen their organizations' financial performance improve, but most respondents have not yet begun investments. Just one in 10 have invested in composite applications — although nearly half of those are already seeing improved financial performance.

Augmented reality/virtual reality (19%) and 5G-enabled devices (11%) are seeing few instances

of early use, and the majority (72%) do not have any plans for quantum computing — yet. Just a third of respondents are using blockchain in some capacity today, primarily bolstered by financial services use cases, but promisingly, more than half expect to implement it within the next five years.

The innovative technologies of tomorrow may be essential to success in the years to come, but our research indicates organizations continue to have more expectations from foundational and established technologies to help curb the tide of disruption. Slow and sporadic investment in emerging technologies could indicate most are still in survival mode, but given the rate of technology progression — accelerated by the pandemic — successful, innovative leaders need to be thinking ahead.

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Meet the leaders

Much of this paper covers the challenges of digital transformation and the shortfalls in planning and execution that most organizations face. However, we did find a select group of respondents who demonstrate the way forward — organizations focused on employee and customer experiences, adept implementation of technology, and sound data practices that are reaping the rewards of their strategic wagers.

These leaders — identified by investments in AI and a focus on customer satisfaction and company culture — make up just 6% of our survey sample. But this elite cohort stands out in several ways.

Their investments and initiatives are creating greater value; they report above-average performance in nearly all areas compared to their competitors. Most notably, they are 35% more

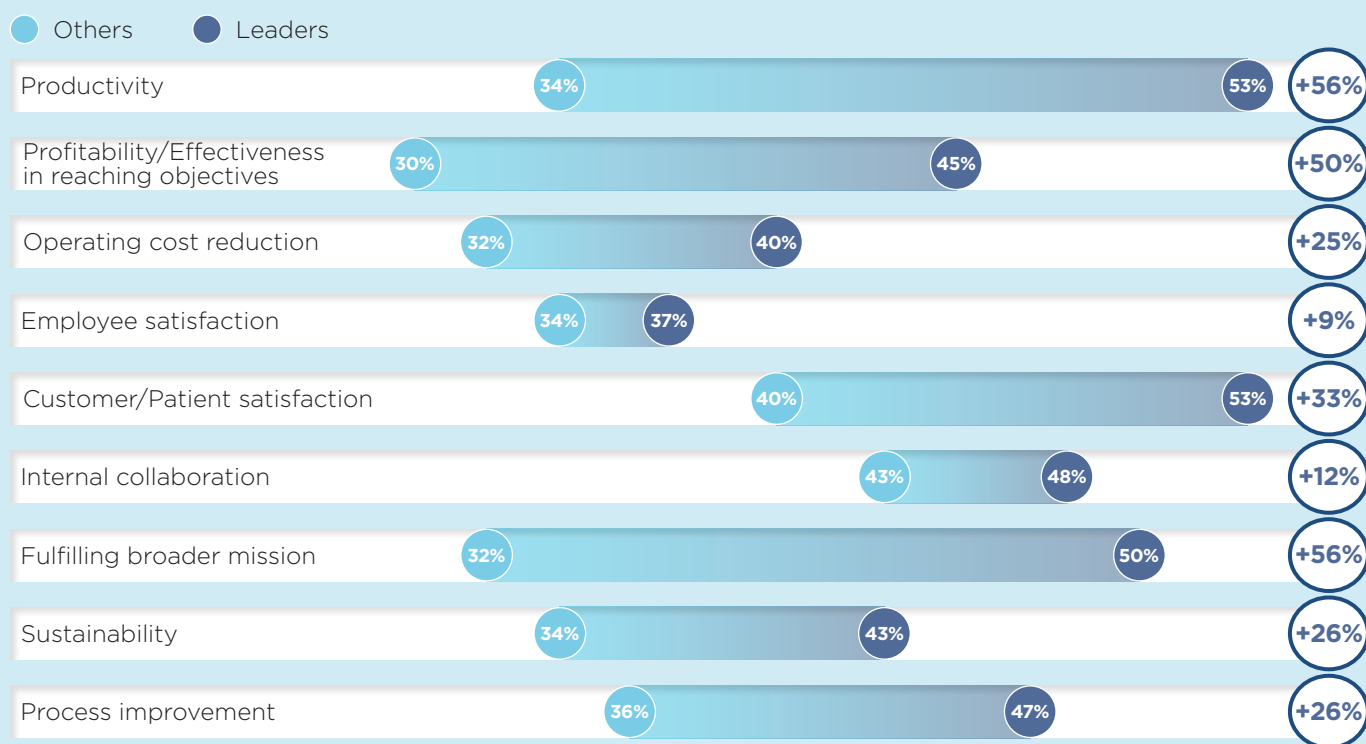
likely to report annual revenue growth of more than 5% and are more likely to expect continued growth over the next two years.

This growth may be attributed to an increased (25%) likelihood to invest in key foundational and established technologies and to an increased (over 50%) likelihood to move to private cloud and invest in digital workplaces. Leaders also recognize the central role mobile experiences play in all parts of modern life, with nearly 40% higher rates of investment in mobile applications than other respondents.

Leaders are using AI effectively, particularly to improve the customer experience. Two critical AI-enabled technologies — the internet of things (IoT) and predictive data analytics — used to support customer-facing processes and services

Fig. 5: Leaders are outperforming their peers in many areas

Q9, rating organization's performance in the following areas (above average responses only)





are top of mind, with leaders being 43% and 21% more likely to invest in IoT and predictive data analytics, respectively.

Leaders are also ahead of their peers in delivering better products and security to their customers. They are 33% more likely to be highly effective in delivering product and service quality to customers, and 29% more likely to indicate that same effectiveness in delivering data security and privacy to customers.

Leadership extends to the use and management of data. Organizations that invest in data literacy are reaping the greatest value from their efforts —

97% (as opposed to 77% of others) say they have an overarching strategy for making use of data. Leaders are also 20% more likely to say the data they collect is useful, well ahead of the general population. Data accuracy, crucial to making sound decisions and developing successful strategies, is slightly higher among leaders (97% vs. 90%). Leaders also express a slightly higher level of confidence that the data they collect is secure. Their investments in data fluency and strategies have positioned them well to meet the rigors of regulations: 63% say their organizations are effectively keeping up with regulatory changes, compared to just 34% of others.



The ever-expanding data challenge



If technology is the engine of digital transformation, data is the fuel. Strategic decision-making is increasingly driven by insights gleaned from data — nearly half of respondents say this information highly influences their supply chain efforts, customer interactions, and process design. But the work of becoming data-centric is hard and getting harder, with more than two-thirds of respondents saying managing these digital resources is becoming increasingly difficult.

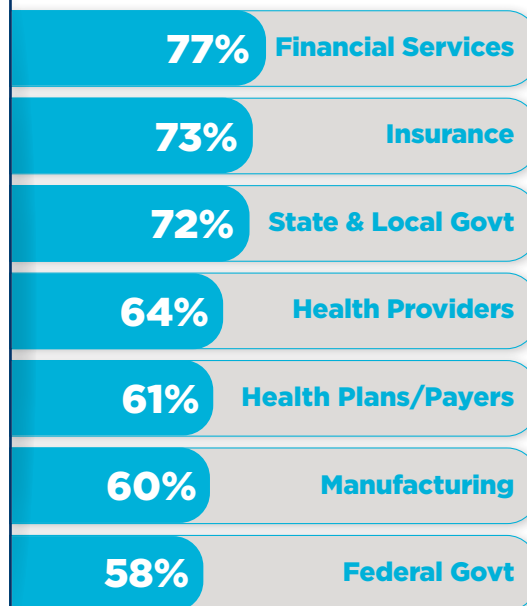
Respondents are mostly confident about their data direction, with more than three-quarters saying they have an overarching strategy for making use of data, but getting there is often a challenge. Data sharing is not widespread enough, with less than half of respondents citing effective internal sharing and nearly one-third admitting they are ineffective at sharing data with ecosystem partners.

Secure data is also critically important to building confidence

in data management — and the use of that information to inform operations. Nearly all respondents have implemented cybersecurity technologies in at least some areas of the business, but more must be done. While 93% believe company data is secure, barely half believe they are highly effective at preventing data security breaches. Though these contradictions between theory and practice are evident in the routine headlines of cyberattacks, the answer may not come from existing data processes — but rather the current state of skills among the workforce.

Regulation is another big challenge to the effective use of data for over half of respondents. More than one-third say inaccurate data from third parties is a barrier to successful execution of strategy. In addition, less than half of respondents feel their data governance plans support innovation. And as only 40% of respondents have implemented predictive analytics, it will be

To what extent do you believe that effectively managing data continues to get harder?

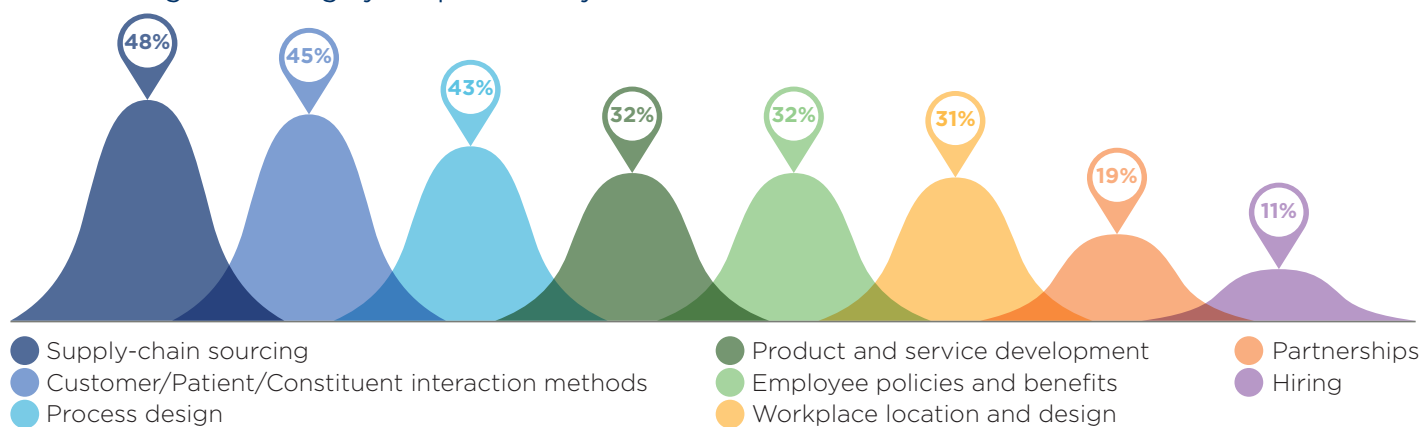


“Agree” and “Strongly agree” responses combined

difficult for many to stay ahead of the next rounds of disruption, develop advanced decision-making capabilities, or stay a step ahead of their most successful rivals.

Fig. 6: Data is not driving decision making

Q. To what extent does the data your organization/agency collects influence strategic decision-making in the following areas? “Highly” responses only





What now?

An era of constant disruption presents significant challenges, and decision-makers will have to stay on their toes over the next year and beyond. But with challenge comes opportunity, and leaders can put themselves in a better position to navigate the road ahead. Effective transformation requires planning now for success later.

Based on the findings of the first annual Innovation Index, leaders should explore the following three steps to build a future-focused and resilient organization:

1) Build confidence to respond quickly to critical and evolving market demands with a secure, agile and data-driven enterprise. Effective implementation, governance, and data analysis will enable organizations to more accurately predict market trends and respond to disruption successfully. Also, by allowing data and systems to be accessible anytime, anywhere, it improves the speed and accuracy of decision making.

2) Foster loyalty by building trusted relationships with hyper-personalized experiences for both customers and employees. Digital technologies are the key to creating empowered work environments, enhancing

customer relationship management, and providing individualized attention to customers and employees that ensures positive interactions and outcomes. When it comes to employees specifically, providing an innovation-focused culture will also lead to direct benefits for all stakeholders.

3) Drive performance

enhancements through a continual process of improvement. Improving the technology ecosystem can help create a culture of innovation, reduce technical debt, increase business efficiency, and allow easier integration of new products/services, along with supporting organizational value.

Following these steps will help organizations generate value in a digital and connected future and attain positive outcomes, such as reducing costs, increasing productivity, improving financial performance, and achieving mission-focused goals. Although the last 18 months or more have brought a seemingly endless cascade of challenges, exciting opportunities await business and IT leaders across industries over the coming years. We look forward to next year's Innovation Index to see the progress organizations have made and to further define the road ahead.

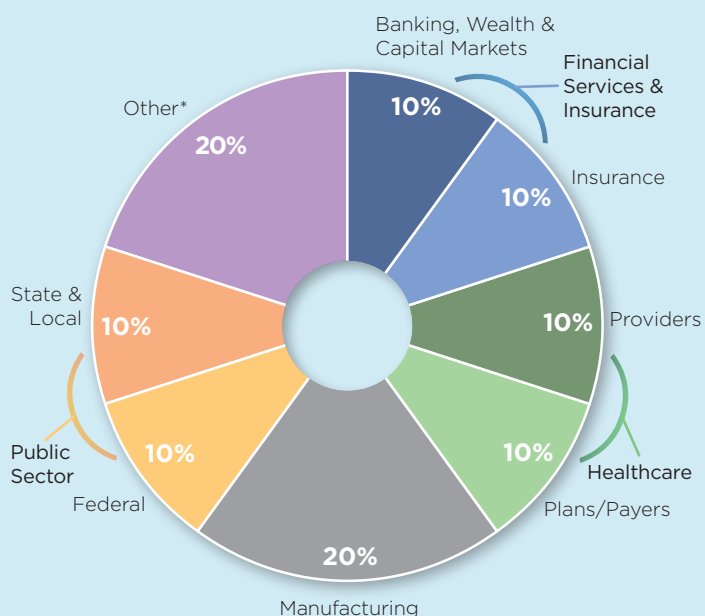
Although the last 18 months or more have brought a seemingly endless cascade of challenges, exciting opportunities await business and IT leaders across industries over the coming years.

About the research

NTT DATA and Oxford Economics surveyed 1,000 business and IT executives across 16 industries about progress towards digital transformation efforts, including organizational priorities, technology investments, data strategies, customer experience, and workforce decisions.

The survey was conducted via computer-assisted telephone interviewing during Q2 and Q3 of 2021. Survey respondents came from the United States (90%) and Canada (10%); the survey sample spans 16 industries, with 56% of the survey population comprised of business executives and 44% comprised of IT executives. All companies in the survey brought in at least \$500 million in annual revenue, with 20% having less than \$1 billion, 40% with between \$1 billion and \$5 billion, and 40% with over \$5 billion; three out of four respondents serve as head of the function, with one-fourth serving as a direct report to the head of the function.

Fig. 7: Survey respondents by industry



*Automotive, Education, Energy, Hospitality, Life Sciences, Retail, Consumer Packaged Goods (CPG), Telecommunications, Transportation

Fig. 8: Survey respondents by annual revenue

