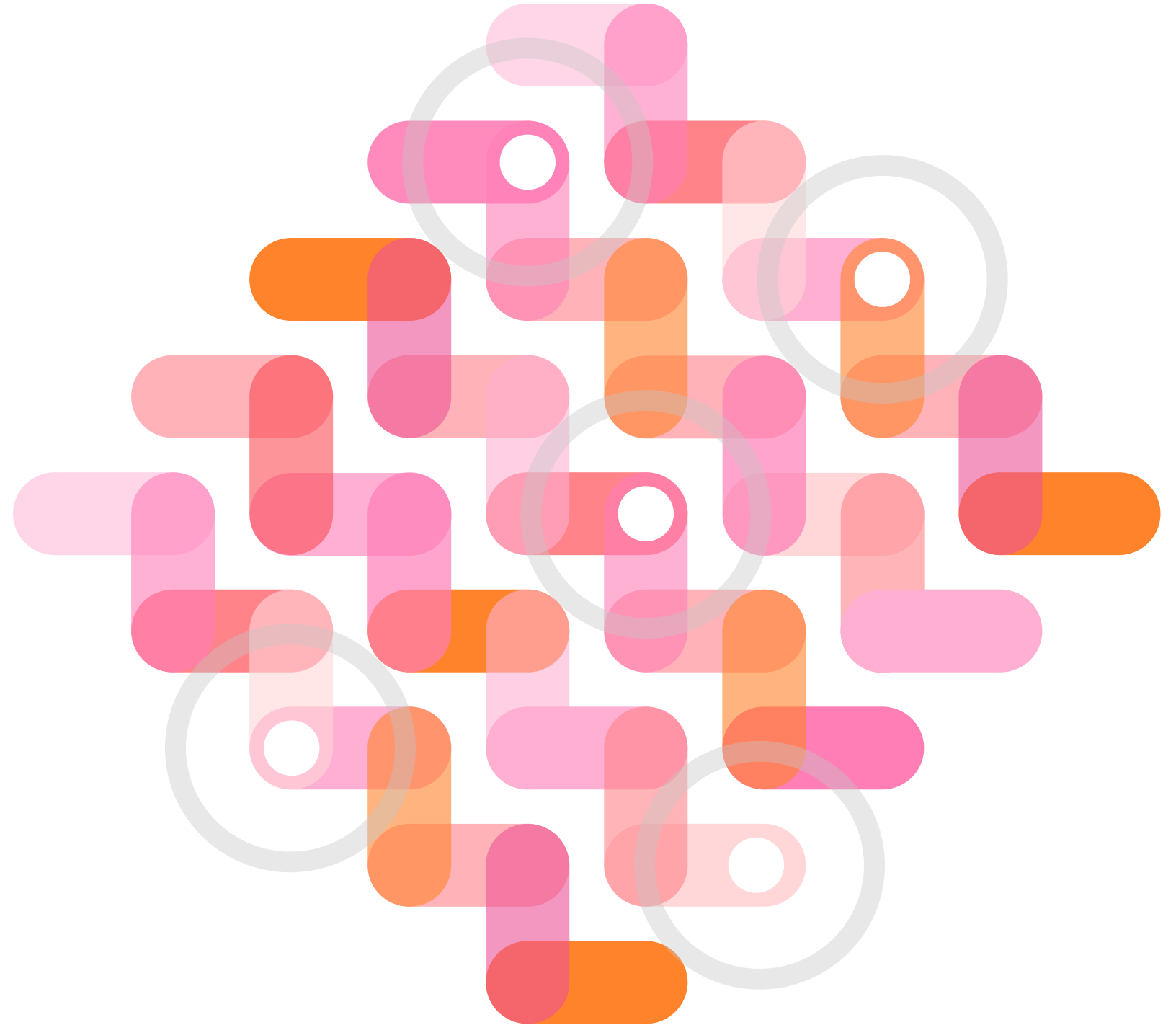


5 trends for 2023

*Embracing chaos,
taking charge*



Deliberation is disrupted

1. Talent shortages and salary pressures cripple growth
 2. Privacy and personalization complicate customer relationships
 3. A confluence of supply chain threats demands continued resilience
 4. Sustainability strategies should be impactful—and realistic
 5. Cyberattack surfaces are expanding exponentially
- Start with the essentials

Deliberation is disrupted

The chaos of the 2020s has pushed leaders to act quickly and decisively. It has accelerated innovation and forced organizations to transform in ways that didn't previously seem possible.

And those that didn't adapt have now fallen behind.¹

In 2023, rapid response is the new baseline. Uncertainty is expected and complexity is compounding. As threats materialize on multiple fronts, organizations must reduce the time from insight to action. Leaders need precise intelligence to dodge obstacles as they appear—and obstacles will be legion.

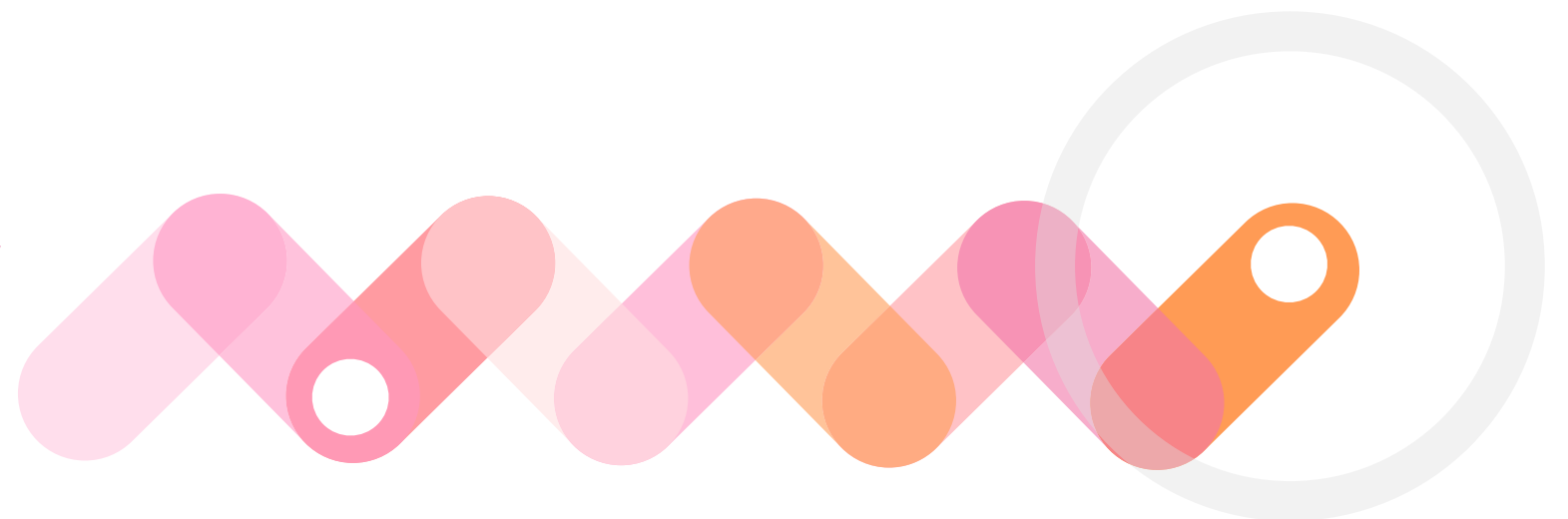
To prepare, executives must try to predict the future. Is a global recession around the corner? Will extreme weather events continue to wreak widespread havoc? Will geopolitical conflicts cool—or will battles move to entirely new fronts? How and where threats appear, as well as where they overlap, will have far-reaching implications for global businesses.

For example, it's unclear how long the war in Ukraine will continue to disrupt supply chains, talent pools, and business operations. But as organizations grapple with the consequences, they must also navigate increasing cost pressures caused by inflation. In October 2022, the International Monetary Fund (IMF) forecast that global inflation would peak at 9.5% in the third quarter of 2022—and some economists fear that price surges could have staying power.²

At the same time, companies are striving to achieve aggressive sustainability targets that require collaboration across aisles and ecosystems. In 2022, global CEOs named sustainability as the top challenge their organizations are expected to face over the next two to three years—rising from sixth place in 2021.³ Plus, purpose-driven consumers, who prioritize products and brands that align with their values, now represent the largest shopper segment (44%).⁴

As disruption drives change on virtually every front, leaders have to keep their heads up. They must respond to threats strategically and pick their battles wisely. To help executives set the right priorities, the IBM Institute for Business Value (IBV) has identified five key trends that we believe will influence the business landscape in 2023—and the top opportunities that can help organizations forge ahead in the face of volatility.

As disruption drives change on virtually every front, leaders have to keep their heads up.



Deliberation is disrupted

1. Talent shortages and salary pressures cripple growth

2. Privacy and personalization complicate customer relationships

3. A confluence of supply chain threats demands continued resilience

4. Sustainability strategies should be impactful—and realistic

5. Cyberattack surfaces are expanding exponentially

Start with the essentials

1 Talent shortages and salary pressures cripple growth

Hiring managers have their work cut out for them in 2023.

Employers worldwide are struggling to fill open positions, with 85 million jobs expected to go unfilled by 2030. Korn Ferry estimates that this labor shortfall could translate to roughly \$8.5 trillion in unrealized annual revenues in the same timeframe.⁵

In September 2022, there were 10.7 million job openings in the US—nearly twice the number of Americans seeking work.⁶ Job vacancy rates have more than doubled since 2020 in both the EU area and Singapore, and they’ve increased 41% in Australia year-over-year.⁷ This broad inability to fill roles is limiting growth opportunities and intensifying the effects of inflation.⁸

The skills shortage is also driving up salary demands as talent investments stagnate. IBV research found a 56% likelihood that employees would say salary was more important than any other employee engagement factor in 2022.⁹ And 38% of Chief Supply Chain Officers (CSCOs) say wage inflation has caused significant supply chain disruptions in the past two years.¹⁰ However, 2023 US salary budgets are expected to increase by just 4%—roughly half the 2022 rate of inflation.¹¹

Flexibility is also a top priority for 2023, as more than one in three (35%) employees say they would not apply for a job that doesn’t offer the ability to work remotely at least part-time (see Figure 1).¹² Two-thirds want to partner with employers to define their work arrangements. Yet, 77% of companies that currently offer hybrid work arrangements plan to change their policies in 2023. 40% said they will require employees to work from an office four days a week and 13% plan to bring employees back full-time.¹³

As worker needs shift—and many organizations resist change—employee loyalty is also diminishing. In the US, employee engagement dropped to 61% in 2022, continuing the downward trend seen in 2021.¹⁴ Globally, IBV research found that 69% of employees said the work they do is more important than the employer they work for and roughly half (52%) worked for their last employer only four years or less.¹⁵



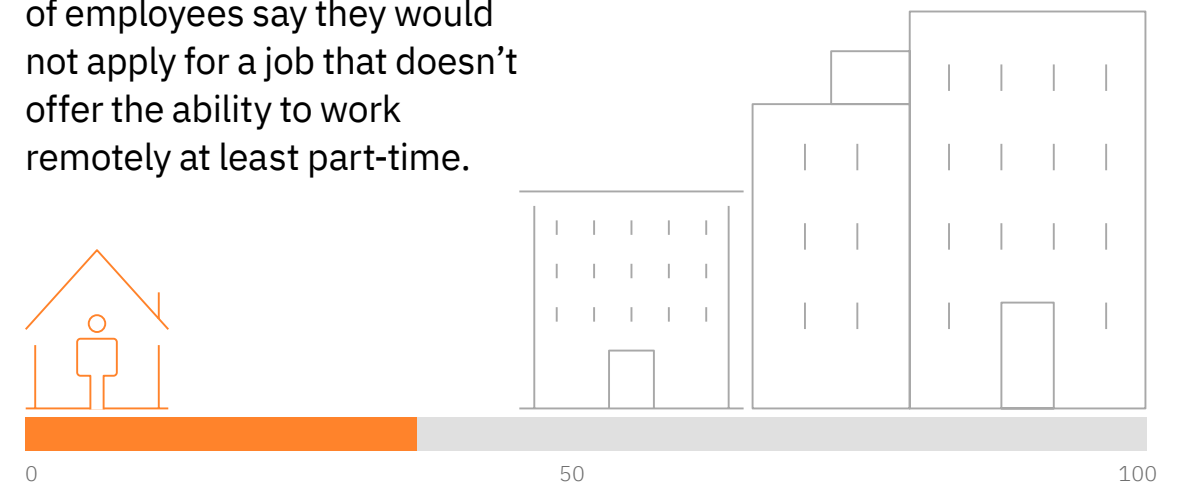
FIGURE 1

Remote control

Flexibility is a top priority for talent in 2023.

35%

of employees say they would not apply for a job that doesn’t offer the ability to work remotely at least part-time.



Deliberation is disrupted

1. Talent shortages and salary pressures cripple growth

2. Privacy and personalization complicate customer relationships

3. A confluence of supply chain threats demands continued resilience

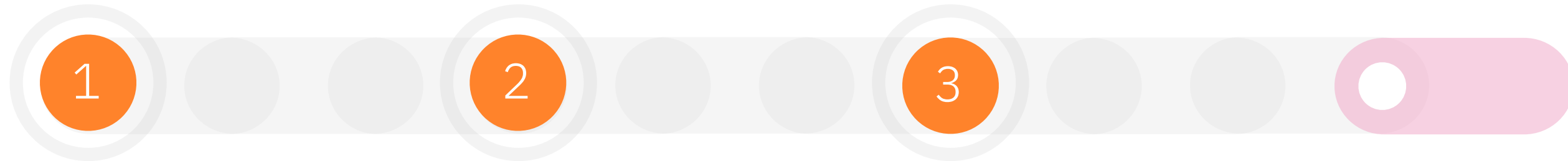
4. Sustainability strategies should be impactful—and realistic

5. Cyberattack surfaces are expanding exponentially

Start with the essentials

Close the talent gap

To attract the right people and enable profitable growth, employers must find a way to meet evolving employee demands—without breaking the bank. Here are three ways companies can reshape their talent strategies to stand out from the competition in 2023.



1. Expand your reach and mine for “hidden talent.”

Share skills and resources with ecosystem partners and outsource workstreams that partners can manage more efficiently. Mine internal operational and employee data to discover untapped skills and talent in your existing workforce. Search for talent with the right skills rather than the right degree.

2. Personalize hybrid work.

Partner with employees to design and define hybrid work models that accommodate unique needs. Allow individuals to customize arrangements and adopt technology that enables secure remote work.

3. Innovate to create value for employees.

While organizations can’t always increase pay, they can help employees improve their quality of life and save time and money in a variety of ways. Explore avenues to reduce employee expenses, such as offering personalized work arrangements, to reduce childcare and commuting costs.

Deliberation is disrupted

1. Talent shortages and salary pressures cripple growth

2. Privacy and personalization complicate customer relationships

3. A confluence of supply chain threats demands continued resilience

4. Sustainability strategies should be impactful—and realistic

5. Cyberattack surfaces are expanding exponentially

Start with the essentials

2 Privacy and personalization complicate customer relationships

The futuristic visions of innovators rarely translate to reality wholesale. They get some things right, but how technology changes our lives is decided by the crowd.

The failure of Google Glass is a case in point.¹⁶ While smart glasses have been a sci-fi staple since the 1980s, a unique combination of privacy and aesthetic concerns stymied Google's attempt to make this vision a reality. And nearly a decade later, companies are still struggling to hit the mark.

But there's a lot to gain by getting immersive technology right. The roughly \$40 billion metaverse market is expected to grow at a compound annual rate of 39% between 2022 and 2030.¹⁷ To make the most of this opportunity, organizations need to offer cutting-edge experiences that capture the imagination and build lasting customer relationships by successfully addressing safety and privacy concerns.

Security is critical as the customer experience becomes more immersive and shopping activities extend across different digital platforms. In 2022, Cisco found that 43% of consumers say they are unable to protect their personal data—with a lack of data transparency being the top cause. Four in five of these individuals say they can't figure out what companies are doing with their data. Overall, 37% of consumers have switched brands to protect their privacy. That number jumps to 68% in India, 43% in China, and 47% in Mexico.¹⁸

Leaders also need to be able to distinguish between a passing fad and the next big thing. Making smart bets that can drive sustainable growth starts with understanding what consumers want from the products they buy and the brands they support.

For example, customers want their shopping and purchasing experiences to flow seamlessly between physical and digital spaces. Hybrid shopping, where people use both digital and physical channels, is now the fastest growing shopping method, and it's the primary shopping method for more than one in four (27%) global consumers, according to IBV research.

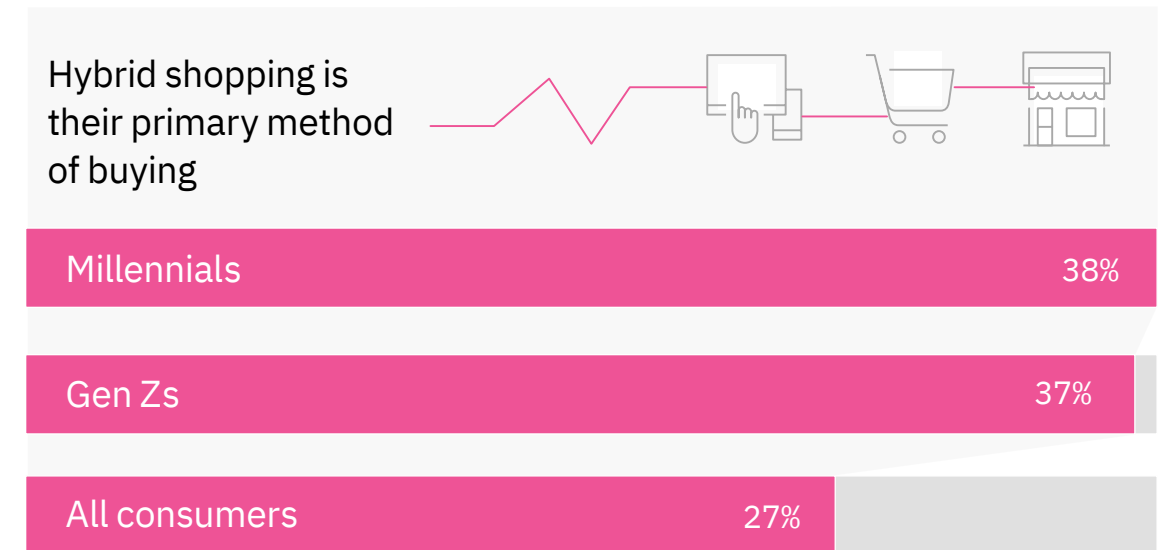
That number jumps to 37% for Gen Z and 38% for Millennials—and will likely continue to rise (see Figure 2).¹⁹



FIGURE 2

The future is hybrid

More than 1 in 3 younger consumers prefer to shop using both physical and digital channels.



Deliberation is disrupted

1. Talent shortages and salary pressures cripple growth

2. Privacy and personalization complicate customer relationships

3. A confluence of supply chain threats demands continued resilience

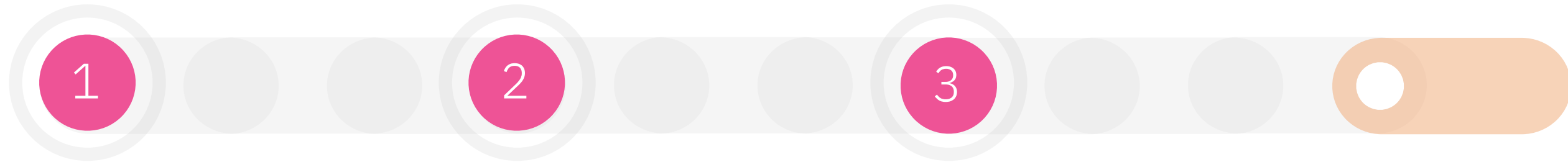
4. Sustainability strategies should be impactful—and realistic

5. Cyberattack surfaces are expanding exponentially

Start with the essentials

Win over the crowd

Companies need to prioritize digital-first products and immersive customer experiences to outpace the competition—but leaders must understand consumer priorities to make the right investments. Here are three ways leaders can boost demand for their brand in 2023.



1 Draw deliberate distinctions between customer segments.

Differentiate between customers focused on purpose, price, and performance, and explicitly target those that best align with the company's offerings and values. Roll out offerings that give these consumers more of what they want most. Deploy AI and automation to drive efficiency and deliver rapid, data-driven insights at scale.

2 Offer experiences that are both unique and intuitive.

Cut through the noise by offering easy-to-use features that enrich the customer journey. Identify and prioritize the technical capabilities necessary to support and orchestrate an immersive, connected, and secure customer experience.

3 Earn customers' trust.

Anticipate and embrace a world where customers take greater ownership over their data. Recognize that people face a tradeoff between privacy and personalization, and they'll seek companies that help them strike the right balance. Clearly define a strategy for data security, privacy, and recovery, and let customers opt out of sharing personal information.

Deliberation is disrupted

1. Talent shortages and salary pressures cripple growth

2. Privacy and personalization complicate customer relationships

3. A confluence of supply chain threats demands continued resilience

4. Sustainability strategies should be impactful—and realistic

5. Cyberattack surfaces are expanding exponentially

Start with the essentials

3 A confluence of supply chain threats demands continued resilience

What does it take to weather a storm that seems like it will never end? Flexibility, ingenuity, and a wide-reaching partner network.

Companies leaned on these capabilities heavily in 2022, as geopolitical conflicts, labor shortages, and natural disasters created scarcity across sectors. Businesses had to get creative to secure access to products and materials—from semiconductors to medications to milk—that were in perpetual short supply.

In 2023, leaders expect supply chain breakdowns to continue to threaten business continuity. IBV research revealed that, in the next two to three years, global CSCOs say they expect macroeconomic and environmental factors to be the top external forces impacting their organizations.²⁰

Natural disasters, for instance, have forced leaders to rethink their supply chain models. The US alone has seen an average of 19 billion-dollar disasters per year for the past three years, up from an average of roughly three per year in the 1980s.²¹ These extreme weather events can wipe out key links in supply chains, potentially crippling the companies that rely on them.

The same holds true for geopolitical disruption. In 2022, the war in Ukraine pushed companies around the world to reconsider their partner ecosystems. One in three CSCOs say they've started working with suppliers in new countries or regions over the last three years—and we expect that number to continue to rise.²² They plan to automate these growing business ecosystems, as well. Overall, CSCOs expect to integrate 32% of their intelligent workflows with ecosystem partners by 2030 (see Figure 3).²³

Many business leaders are also reshaping their supply chains to mitigate the growing threat of climate change. Nearly 50% of CSCOs anticipate sustainability initiatives will substantially change their supply chain models over the next two to three years.²⁴ Across the C-suite, 38% of executives expect to change suppliers and vendors based on their sustainability profiles, and 32% plan to transform sourcing practices toward low emissions, pollution, and waste in the next three years.²⁵

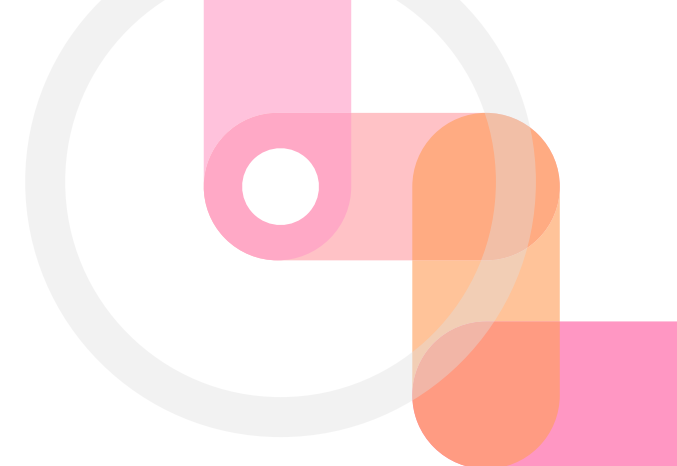
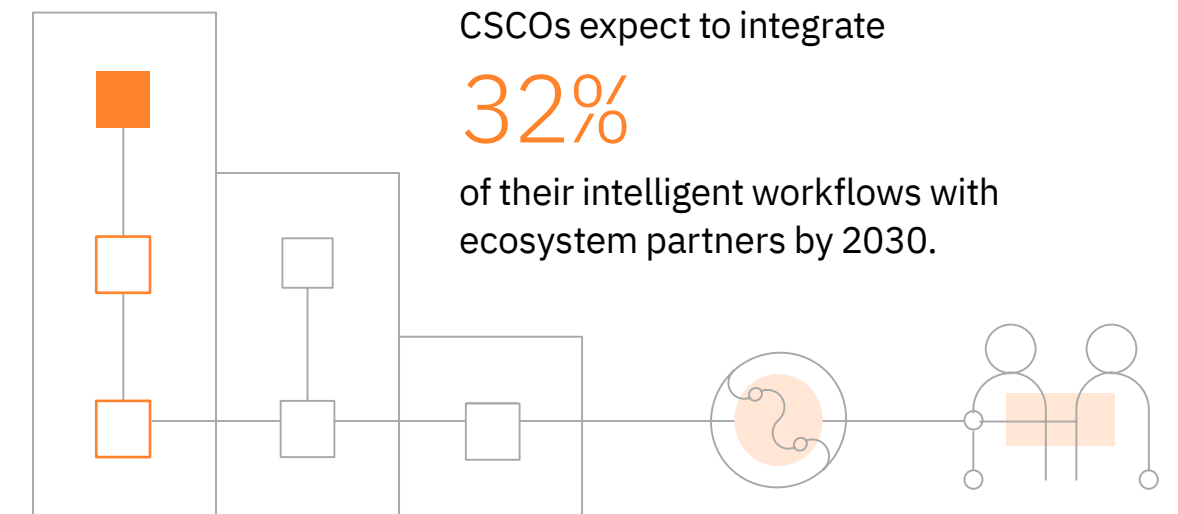


FIGURE 3

Smarter resilience

Companies are automating growing business ecosystems.



Deliberation is disrupted

1. Talent shortages and salary pressures cripple growth

2. Privacy and personalization complicate customer relationships

3. A confluence of supply chain threats demands continued resilience

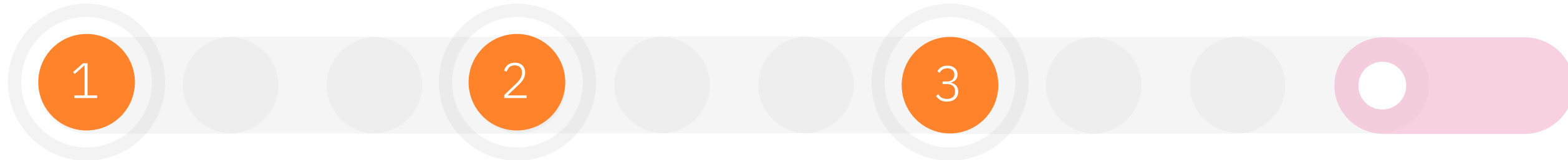
4. Sustainability strategies should be impactful—and realistic

5. Cyberattack surfaces are expanding exponentially

Start with the essentials

Build a change-ready supply chain

Companies are focused on increasing agility and resilience as they navigate a perfect storm of threats—but added pressures also present promising opportunities. Here are three ways leaders can position their supply chains for success in 2023.



1 Gain faster insights with intelligent workflows.

Automation can introduce greater predictability, flexibility, and insights into operations and decision-making. Integrating AI can also help organizations monitor quality, track performance, and generate more accurate forecasts in almost real time.

2 Design for business continuity.

Technologies such as 3D printing, intelligent robotics, and open source hardware can give leaders more control. They can infuse resiliency into the supply chain and help organizations adapt faster to change—if they have talent with the right skills in place.

3 Adopt sustainable supply chain models.

Articulate simple, transparent metrics and collaborate across business ecosystems to define common standards and terminology. Work with partners to track and report progress for consumers, board members, and investors.

Deliberation is disrupted

1. Talent shortages and salary pressures cripple growth

2. Privacy and personalization complicate customer relationships

3. A confluence of supply chain threats demands continued resilience

4. Sustainability strategies should be impactful—and realistic

5. Cyberattack surfaces are expanding exponentially

Start with the essentials

4 Sustainability strategies must be impactful—and realistic

Businesses need to make big strides to hit new sustainability targets in 2023.

As more stringent regulations come into effect, organizations will need to measure their environmental impact clearly and accurately to manage compliance.

The EU’s new Corporate Sustainability Reporting Directive (CSRD) will require 50,000 companies to disclose more detailed information about their environmental footprint, and its rules will take effect between 2024 and 2028.²⁶ Mandatory reporting for the Task Force on Climate-Related Financial Disclosures (TCFD) in the UK and the Security Exchange Commission (SEC) in the US will add to compliance complexity.

Stakeholders will also continue to demand that leaders set targets that stretch beyond the minimum requirements. As companies map out wide-reaching plans to achieve net-zero emissions and other ambitious goals, roughly half of CEOs say they feel direct pressure from ecosystem partners, board members, and investors to improve sustainability outcomes.²⁷

However, the good environmental intentions of many organizations have yet to be realized. In a recent IBV survey covering manufacturing-oriented industries, 86% of executives said their organizations have a sustainability strategy in place, but only 35% had acted on that strategy (see Figure 4). Only one in three had integrated sustainability objectives and metrics into business processes.²⁸ Likewise, CEOs cited unclear ROI and economic benefits (57%) and a lack of insights from data (44%) as their greatest challenges to achieving their sustainability objectives.²⁹

As sustainability becomes a central component of transformation efforts, leaders will need mature tech to help them track and advance their strategic priorities. In fact, 42% of CIOs say sustainability is an area within their organization where technology can have the biggest impact over the next three years.³⁰ And transformation trailblazers—organizations that have successfully integrated sustainability into their digital transformation—have seen their revenues grow faster than their peers.³¹



Consumers are willing to reward companies that make meaningful progress, as well. Recent IBV research found that roughly half (49%) of consumers globally say they paid an average premium of 59% for products branded as sustainable or socially responsible as part of their last purchase. Even 4 out of 10 (43%) consumers in the lower income bracket say they’ve paid this type of premium.³² Purpose-driven consumers are also great brand ambassadors. 58% have recently introduced friends and family to a new brand or retailer.³³

FIGURE 4

More talk than action

Few organizations have taken steps to realize sustainability goals.



Deliberation is disrupted

1. Talent shortages and salary pressures cripple growth

2. Privacy and personalization complicate customer relationships

3. A confluence of supply chain threats demands continued resilience

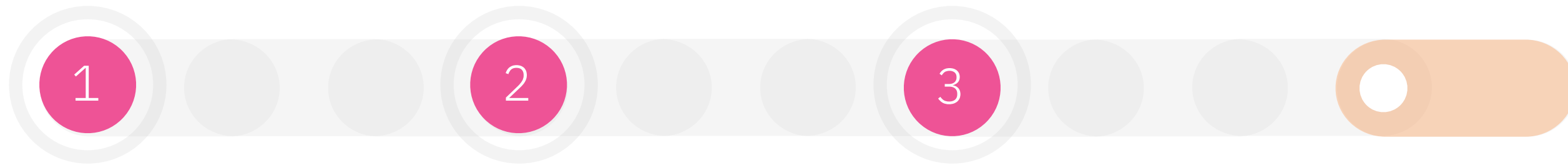
4. Sustainability strategies should be impactful—and realistic

5. Cyberattack surfaces are expanding exponentially

Start with the essentials

Make a meaningful impact

As the atmosphere warms, plastics proliferate, and extinctions eliminate more species each year, leaders must look beyond emissions reduction and think more holistically about the organization's overall impact on the environment. Here are three ways companies can create strategies to preserve the planet—and boost the bottom line—in 2023.



1. Make sustainability central to business strategy.

Stakeholders are looking for less talk and more action. Use operational structures, including compensation packages, enterprise change management programs, and active employee engagement initiatives to encourage transformation. Work with ecosystem partners and suppliers to adopt sustainable practices.

2. Communicate clear sustainability goals.

Define an actionable message with detailed priorities to depict the enterprise-wide transformation potential of sustainability. Consistently broadcast that message to leadership, stakeholders, partners, and consumers. Align objectives with ecosystem partners and across silos to identify opportunities and resolve issues more effectively.

3. Find ways to drive profitability through sustainability.

Digital transformation and sustainability transformation should complement each other. Define sustainability measures and use data, technology, and standardized metrics to advance sustainability goals through daily operations. Increase visibility to manage costs and environmental impact in tandem.

Deliberation is disrupted

1. Talent shortages and salary pressures cripple growth

2. Privacy and personalization complicate customer relationships

3. A confluence of supply chain threats demands continued resilience

4. Sustainability strategies should be impactful—and realistic

5. Cyberattack surfaces are expanding exponentially

Start with the essentials

5 Cyberattack surfaces are expanding exponentially

Encryption codes, which are very difficult to crack, serve as the backbone of the cyber economy. But what would happen if that backbone were broken?

By 2030, quantum computers could be capable of cracking public security protections. And it may take between 5 and 10 years to replace most current public key systems.³⁴ To limit their risk exposure, companies need to explore new approaches to cybersecurity. Yet, they must also focus their resources on the imminent threats they face today.

Data breaches are now more expensive and impactful than ever. The average cost of a data breach in the United States in 2022 was \$9.44 million, which is more than double the global average of \$4.35 million. And highly regulated industries incur nearly one-quarter (24%) of breach costs more than two years after the incident.³⁵

A proliferation of connected devices and services has also expanded attack surfaces. Experts predict the number of active Internet of Things (IoT) devices will grow to 14.4 billion by the end of 2022, reflecting an 18% year-over-year growth rate.³⁶ The number of vulnerabilities related to IoT devices grew 16% in 2022 alone, compared to a growth rate of only 0.4% for all vulnerabilities.³⁷

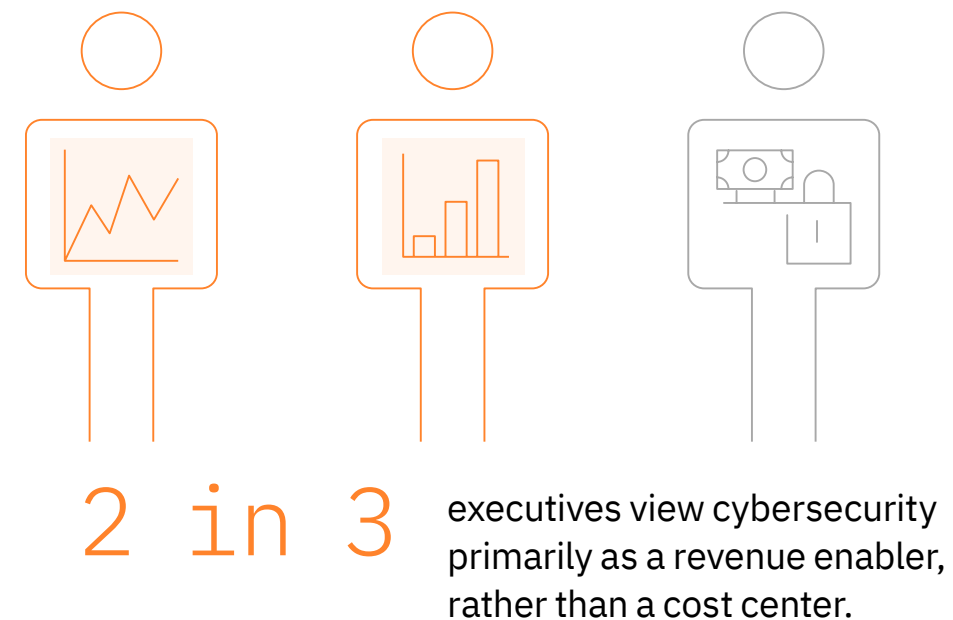
The risks posed by security gaps and new attack vectors are being compounded by a cyber skills shortage. Globally, organizations faced a cybersecurity workforce gap of 3.4 million people in 2022.³⁸ More than half (54%) of executives say a lack of talent is one of the greatest obstacles to their organization's cyber resilience.³⁹ Security AI and automation can address both capacity and specialization challenges.⁴⁰

Yet, the future of cybersecurity isn't all about risk mitigation. While evolving technology opens the door to a variety of new threats, it also paves new avenues for growth. In fact, two in three executives now view cybersecurity primarily as a revenue enabler, rather than a cost center (see Figure 5).⁴¹

FIGURE 5

Flip the equation

Leaders are shifting their perspective on cybersecurity.



Deliberation is disrupted

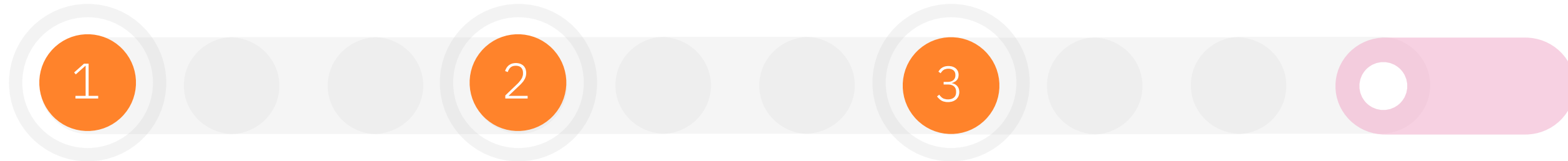
1. Talent shortages and salary pressures cripple growth
2. Privacy and personalization complicate customer relationships
3. A confluence of supply chain threats demands continued resilience
4. Sustainability strategies should be impactful—and realistic

5. Cyberattack surfaces are expanding exponentially

Start with the essentials

Raise the shields

To protect their organizations from evolving threats while also positioning them for growth, leaders need to take a more proactive approach to cybersecurity. Here are three ways organizations can think differently to improve their cyber resilience in 2023.



1 Prepare for complex cyber risks.

Integrate cybersecurity across internal silos and the broader ecosystem. Consider working with a partner to share responsibility for security program governance by emphasizing shared value and collective resilience.

2 Enhance cybersecurity with AI and automation.

Leverage AI technologies in security operations to optimize cost-performance improvements. The combination of AI and automation can improve incident discovery and response times by enabling better security controls and improving threat detection and response performance.

3 Invest in and equip your cyber workforce.

Recognize and nurture your cybersecurity workforce as a highly valuable asset. Stimulate skills development by creating opportunities for growth. Use AI and automation so cybersecurity analysts can shift their focus to what really matters: addressing more complex problems that require human judgement to solve.

Deliberation is disrupted

1. Talent shortages and salary pressures cripple growth
2. Privacy and personalization complicate customer relationships
3. A confluence of supply chain threats demands continued resilience
4. Sustainability strategies should be impactful—and realistic
5. Cyberattack surfaces are expanding exponentially

Start with the essentials

Start with the essentials

Disentangling complexities can confound even the most skilled and savvy executives.

With so much in disarray, it can be difficult for leaders to decide where to begin. Prioritize the work that best aligns with business strategy—and will deliver measurable results. Invest in the skills and capabilities that are central to achieving key objectives and engage with partners that can offer support in key areas.

It's also time to re-evaluate the organization's changing sense of mission and make sure everyone agrees on what matters most. Focus on what can be controlled—and take confident and purposeful strides forward.

In an uncertain environment, success is based on dynamic factors, such as collaboration, innovation, and adaptability. This requires turning insights into outcomes, convictions into capabilities, and chaos into control. In 2023, successful leaders will use a combination of technology and human ingenuity to seize the opportunities ahead.



IBM Institute for Business Value

The IBM Institute for Business Value (IBV) delivers trusted, technology-based business insights by combining expertise from industry thinkers, leading academics, and subject matter experts with global research and performance data. The IBV thought leadership portfolio includes research deep dives, benchmarking and performance comparisons, and data visualizations that support business decision making across regions, industries, and technologies.

For more information

Follow @IBMIBV on Twitter, and to receive the latest insights by email, visit ibm.com/ibv

Notes and sources

- 1 “The 2021 CIO Study. The CIO Revolution: Breaking barriers, creating value.” IBM Institute for Business Value. November 2021. <https://ibm.co/c-suite-study-cio>
- 2 Partington, Richard. “Global inflation may be close to its peak, IMF director says.” The Guardian. November 7, 2022. <https://www.theguardian.com/business/2022/nov/07/global-inflation-economy-imf-managing-director-kristalina-georgieva>
- 3 “The CEO Study. Own your impact: Pathways to transformational sustainability.” IBM Institute for Business Value. May 2022. <https://ibm.co/c-suite-study-ceo>
- 4 Haller, Karl, Mary Wallace, Jane Cheung, and Sachin Gupta. “Consumers want it all: Hybrid shopping, sustainability, and purpose-driven brands.” IBM Institute for Business Value. January 2022. <https://ibm.co/2022-consumer-study>
- 5 Franzino, Michael, Alan Guarino, Yannick Binvel, and Jean-Marc Laouchez. “The \$8.5 Trillion Talent Shortage.” Korn Ferry. Accessed November 30, 2022. <https://www.kornferry.com/insights/this-week-in-leadership/talent-crunch-future-of-work>
- 6 “Job Openings and Labor Turnover Summary.” US Bureau of Labor Statistics. November 1, 2022. <https://www.bls.gov/news.release/jolts.nr0.htm>; “The Employment Situation—October 2022.” US Bureau of Labor Statistics. Accessed November 4, 2022. <https://www.bls.gov/news.release/pdf/empstat.pdf>
- 7 “Job vacancy statistics.” eurostat. Accessed November 21, 2022. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Job_vacancy_statistics&ol-did=576938#Job_vacancies_between_2009_and_2022; “Summary Table: Job Vacancy.” Ministry of Manpower, Singapore Government. September 14, 2022. <https://stats.mom.gov.sg/Pages/Job-Vacancy-Summary-Table.aspx>
- 8 “Job Vacancies, Australia.” Australian Bureau of Statistics. September 29, 2022. <https://www.abs.gov.au/statistics/labour/jobs/job-vacancies-australia/latest-release>
- 9 IBM Institute for Business Value Global Survey of 16,349 employees. March 2022.
- 10 “The CSCO Study. Own your transformation: Data-led innovation for the modern supply chain.” IBM Institute for Business Value. September 2022. <https://ibm.co/c-suite-study-csco>
- 11 “Salary Budget Survey 2022-2023.” WorldatWork. July 26, 2022. https://worldatwork.org/media/CDN/dist/CDN2/documents/pdf/resources/sbs/SBS2022-23_TopLevelData.pdf; “United States Inflation Rate.” Trading Economics. Accessed November 21, 2022. <https://tradingeconomics.com/united-states/inflation-cpi>
- 12 IBM Institute for Business Value Global Survey of 16,349 employees. March 2022.
- 13 “9 in 10 companies will require employees to work from office in 2023.” Resume Builder. October 13, 2022. <https://www.resumebuilder.com/9-in-10-companies-will-require-employees-to-work-from-office-in-2023/>
- 14 Helbig, Bob. “Top Workplaces 2022 trends: Workers are doing plenty of soul-searching.” Orlando Sentinel. September 16, 2022. <https://www.orlandosentinel.com/business/top-workplaces/os-bz-top-workplaces-2022-trends-20220916-ezlkdygxdvrhd5z6kgno5fh6e-story.html>
- 15 IBM Institute for Business Value Global Survey of 16,349 employees. March 2022.
- 16 Dougherty, Conor. “A Retreat for Google Glass and a Case Study in the Perils of Making Hardware.” The New York Times. January 18, 2015. <https://archive.nytimes.com/blogs.nytimes.com/2015/01/18/a-retreat-for-google-glass-and-a-case-study-in-the-perils-of-making-hardware/>
- 17 “Metaverse Market Size, Share & Trends Analysis Report By Product, By Platform, By Technology (Blockchain, Virtual Reality (VR) & Augmented Reality (AR), Mixed Reality (MR)), By Offering, By Application, By End Use, By Region, And Segment Forecasts, 2022-2030.” Grand View Research. Accessed November 21, 2022. <https://www.grandviewresearch.com/industry-analysis/metaverse-market-report>
- 18 “Data Transparency’s Essential Role in Building Customer Trust.” Cisco. Accessed November 21, 2022. https://www.cisco.com/c/dam/en_us/about/doing_business/trust-center/docs/cisco-consumer-privacy-survey-2022.pdf
- 19 Haller, Karl, Mary Wallace, Jane Cheung, and Sachin Gupta. “Consumers want it all: Hybrid shopping, sustainability, and purpose-driven brands.” IBM Institute for Business Value, January 2022. <https://ibm.co/2022-consumer-study>
- 20 “The CSCO Study. Own your transformation: Data-led innovation for the modern supply chain.” IBM Institute for Business Value. September 2022. <https://ibm.co/c-suite-study-csco>
- 21 “U.S. Billion-Dollar Weather and Climate Disasters.” NOAA National Centers for Environmental Information. Accessed November 21, 2022. <https://www.ncei.noaa.gov/access/billions/time-series>
- 22 Bounds, Matthew and Bob Murphy. “Smart procurement made smarter: Five ways digital intelligence drives value.” IBM Institute for Business Value. September 2022. <https://ibm.co/smart-procurement>

- 23 Hinish, Sheri, Lars Reinkemeyer, and Karen Butner. “The resilient digital supply chain: How intelligent workflows balance efficiency and sustainability.” IBM Institute for Business Value and Celonis. April 2022. <https://ibm.co/digital-supply-chain>
- 24 “The CSCO Study. Own your transformation: Data-led innovation for the modern supply chain.” IBM Institute for Business Value. September 2022. <https://ibm.co/c-suite-study-csco>
- 25 Balta, Wayne, Manish Chawla, Jacob Dencik, and Spencer Lin. “Sustainability as a transformation catalyst: Trailblazers turn aspiration into action.” IBM Institute for Business Value. January 2022. <https://ibm.co/sustainability-transformation>
- 26 “Sustainable economy: Parliament adopts new reporting rules for multinationals.” European Parliament. October 11, 2022. <https://www.europarl.europa.eu/news/en/press-room/20221107IPR49611/sustainable-economy-parliament-adopts-new-reporting-rules-for-multinationals>
- 27 “The CEO Study. Own your impact: Pathways to transformational sustainability.” IBM Institute for Business Value. May 2022. <https://ibm.co/c-suite-study-ceo>
- 28 Balta, Wayne, Manish Chawla, Jacob Dencik, and Spencer Lin. “Sustainability as a transformation catalyst: Trailblazers turn aspiration into action.” IBM Institute for Business Value. January 2022. <https://ibm.co/sustainability-transformation>
- 29 “The CEO Study. Own your impact: Pathways to transformational sustainability.” IBM Institute for Business Value. May 2022. <https://ibm.co/c-suite-study-ceo>
- 30 “The 2021 CIO Study. The CIO Revolution: Breaking barriers, creating value.” IBM Institute for Business Value. November 2021. <https://ibm.co/c-suite-study-cio>
- 31 Balta, Wayne, Manish Chawla, Jacob Dencik, and Spencer Lin. “Sustainability as a transformation catalyst: Trailblazers turn aspiration into action.” IBM Institute for Business Value. January 2022. <https://ibm.co/sustainability-transformation>
- 32 Cheung, Jane, Catherine Filare, Cristene Gonzales-Wertz, Christopher Nowak, Gillian Orrell, and Steve Peterson. “Balancing sustainability and profitability: How businesses can protect people, planet, and the bottom line.” IBM Institute for Business Value. April 2022. <https://ibm.co/2022-sustainability-consumer-research>
- 33 Haller, Karl, Mary Wallace, Jane Cheung, and Sachin Gupta. “Consumers want it all: Hybrid shopping, sustainability, and purpose-driven brands.” IBM Institute for Business Value, January 2022. <https://ibm.co/2022-consumer-study>
- 34 Harishankar, Ray, Sridhar Muppidi, Michael Osborne, Walid Rjaibi, and Joachim Schaefer. “Security in the quantum computing era: The risk is real, the need is now.” IBM Institute for Business Value. December 2022. <https://ibm.co/quantum-safe-encryption>
- 35 “Cost of a data breach 2022.” IBM Security and the Ponemon Institute. July 2022. <https://www.ibm.com/reports/data-breach>
- 36 Mohammad Hasan. “State of IoT 2022: Number of connected IoT devices growing 18% to 14.4 billion globally.” IOT Analytics. May 18, 2022. <https://iot-analytics.com/number-connected-iot-devices/>
- 37 “X-Force Threat Intelligence Index 2022.” IBM Security. Accessed November 21, 2022. <https://www.ibm.com/reports/threat-intelligence/>
- 38 “Cybersecurity Workforce Study 2022.” (ISC)². Accessed November 21, 2022. <https://www.isc2.org/Research/Workforce-Study#>
- 39 McCurdy, Chris, Shlomi Kramer, Gerald Parham, and Jacob Dencik. “Prosper in the cyber economy: Rethinking cyber risk for business transformation.” IBM Institute for Business Value. November 2022. <https://ibm.co/security-cyber-economy>
- 40 Muppidi, Sridhar, Lisa Fisher, and Gerald Parham. “AI and automation for cybersecurity: How leaders succeed by uniting technology and talent.” IBM Institute for Business Value. June 2022. <https://ibm.co/ai-cybersecurity>
- 41 McCurdy, Chris, Shlomi Kramer, Gerald Parham, and Jacob Dencik. “Prosper in the cyber economy: Rethinking cyber risk for business transformation.” IBM Institute for Business Value. November 2022. <https://ibm.co/security-cyber-economy>



© Copyright IBM Corporation 2023

IBM Corporation
New Orchard Road
Armonk, NY 10504

Produced in the United States of America | January 2023

IBM, the IBM logo, ibm.com and Watson are trademarks of International Business Machines Corp., registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available on the web at “Copyright and trademark information” at: ibm.com/legal/copytrade.shtml.

This document is current as of the initial date of publication and may be changed by IBM at any time. Not all offerings are available in every country in which IBM operates.

THE INFORMATION IN THIS DOCUMENT IS PROVIDED “AS IS” WITHOUT ANY WARRANTY, EXPRESS OR IMPLIED, INCLUDING WITHOUT ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND ANY WARRANTY OR CONDITION OF NON-INFRINGEMENT. IBM products are warranted according to the terms and conditions of the agreements under which they are provided.

This report is intended for general guidance only. It is not intended to be a substitute for detailed research or the exercise of professional judgment. IBM shall not be responsible for any loss whatsoever sustained by any organization or person who relies on this publication.

The data used in this report may be derived from third-party sources and IBM does not independently verify, validate or audit such data. The results from the use of such data are provided on an “as is” basis and IBM makes no representations or warranties, express or implied.

JLKJK1ZP-USEN-01