IBM Institute for Business Value

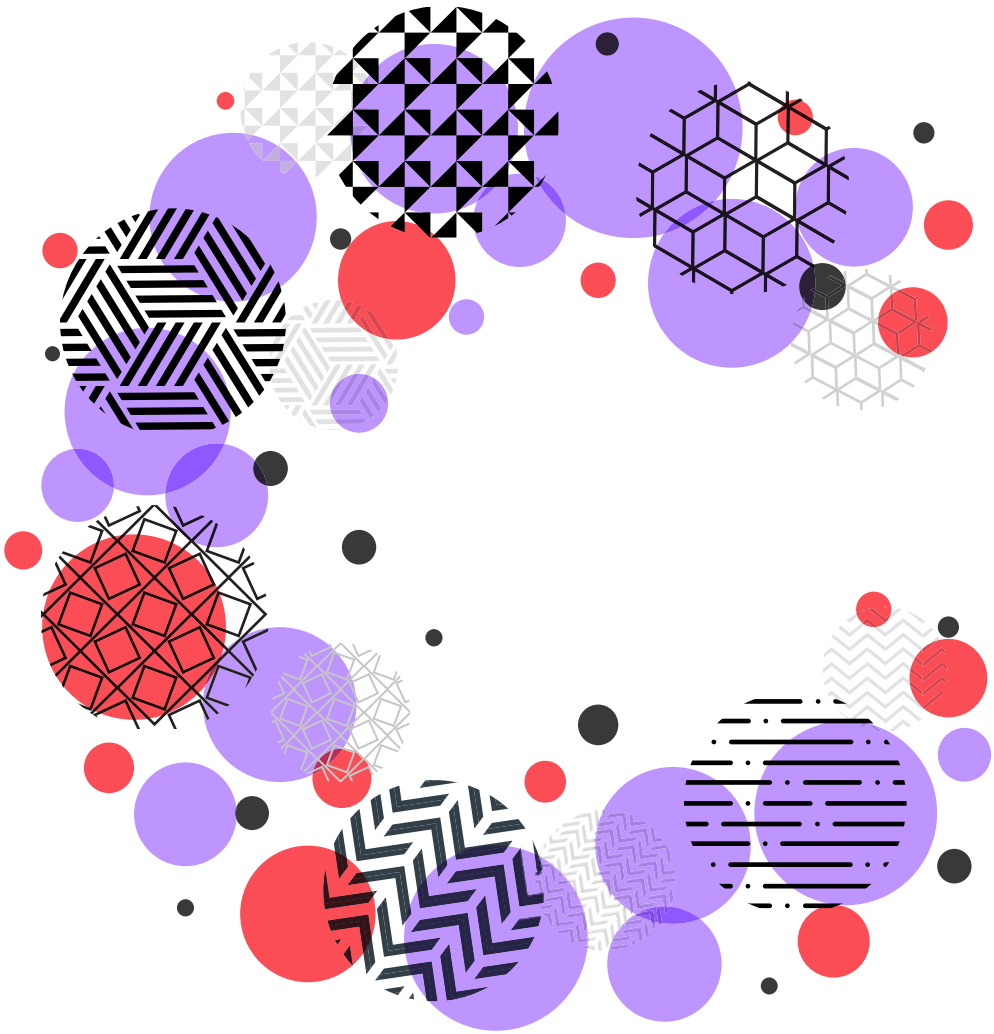
Global
C-suite
Series

30th Edition

Technology Leaders Study

6 blind spots tech leaders must reveal

How to drive growth in the generative AI era



IBM

About the study

In Q1 2024, in cooperation with Oxford Economics, the IBM Institute for Business Value (IBM IBV) surveyed 2,500 C-suite technology leaders, including Chief Technology Officers (CTOs), Chief Information Officers (CIOs), and Chief Data Officers (CDOs). Separately, a small group of executives was engaged for in-depth, qualitative interviews. These discussions focused on key insights from the study and the executives' on-the-ground experience leading technology for organizations in the new era of AI. With respondents spanning 26 industries and 34 locations worldwide, this study marks a significant first look at a new technology coalition that is managing the enablement and delivery of AI capabilities across the business. For more details, see "Research methodology and analysis" on page 62.

The cover concept and individual patterns in this report were developed using generative AI.

IBM IBV designers translated each of the "blind spots" into prompts, and then used these prompts within Adobe Firefly to generate vector-based imagery that inspired the basis and structure for each pattern. Similarly, the photos that appear in this report were identified using AI-assisted, natural-language search, using the generated patterns as reference images.

Overall, the efficiency gained by integrating these tools into the design process is as follows:

Concept—3 weeks to 1.5 days

Patterns—2 weeks to 2 days

Photography—1 week to 2 hours

Contents

The end of business as usual

Elevating tech leadership

IT as a standalone function is dead. The rapid ascent of generative AI delivered the death knell. Technology *is* the business. And 72% of top-performing CEOs say competitive advantage depends on who has the most advanced generative AI.[1] That means organizations are counting on tech leaders as never before.

> "Business leaders are becoming more tech savvy. When you have a discussion, they have a very good understanding of what technology can do. You have to be empathetic to what they understand. It involves being much more versatile."

Bernd Bucher
Global Head Data, Digital, & IT/CIO, Novartis

CEOs who say technology officers will be crucial decision-makers over the next three years increased 50% since 2023.[2] CFOs cite CTOs as the partners most important to their success.[3] To meet these expectations will demand a new approach to tech leadership.

For technology to deliver enterprise-wide business outcomes, tech leaders must be part mastermind, part maestro. They must architect technology strategy across data, security, operations, and infrastructure, teaming with business leaders—speaking their language, not tech jargon—to understand needs, imagine possibilities, identify risks, and coordinate investments. They must build multidisciplinary teams to bring the strategy to life, encouraging the experimentation and fresh ideas that inspire employees and delight customers.

It's an enormous responsibility and one that many tech leaders have struggled to meet. As the scope of "technology" has expanded over the past two decades, new roles have been added. But despite a growing team of technology leaders, "technology" has not consistently and effectively been integrated into strategic decision-making for the business (see Perspective, "Beyond the org chart: A high-powered tech coalition" on page 6).

Our 2024 survey of 2,500 CIOs, CTOs, and CDOs suggests they are still being left out of critical conversations. Their absence or ineffective participation has resulted in organizational blind spots in areas such as data, infrastructure, talent, and innovation. While 43% of CEOs say they intend to increase the pace of change for their organization this year,[4] these blind spots are making it difficult for organizations to seize today's opportunities in artificial intelligence in all its guises—traditional AI, gen AI, machine learning, and automation.

Our study also reveals that tech leaders are straining under the pressure. More than half say they're struggling to balance growth and productivity, and juggling tasks is taking a toll on internal operations. Notably, the percentage of C-suite leaders who say their IT function is effective in delivering even basic services has plummeted over the last decade (see Figure 1).

We see in our results that when tech claims an equal seat at the C-suite table, they can indeed steer significant outcomes (see "Tech outperformers crack the code to success"). But just as CEOs must face the hard truths outlined in our 2024 CEO study, tech leaders must courageously expose the blind spots that are preventing their organizations from achieving AI advantage. In this report, we discuss how these impediments can be overcome if tech executives command the honest, must-have discussions about the readiness of their organization to deliver breakthrough innovation and business outcomes. The future is on the line. Tech leaders' ability to insert their essential expertise into enterprise decisions will ultimately determine their organizations' success in the AI era.

"I do believe that technology teams are called to have greater symbiosis with our business. The boundaries between business and technology have become increasingly blurred."

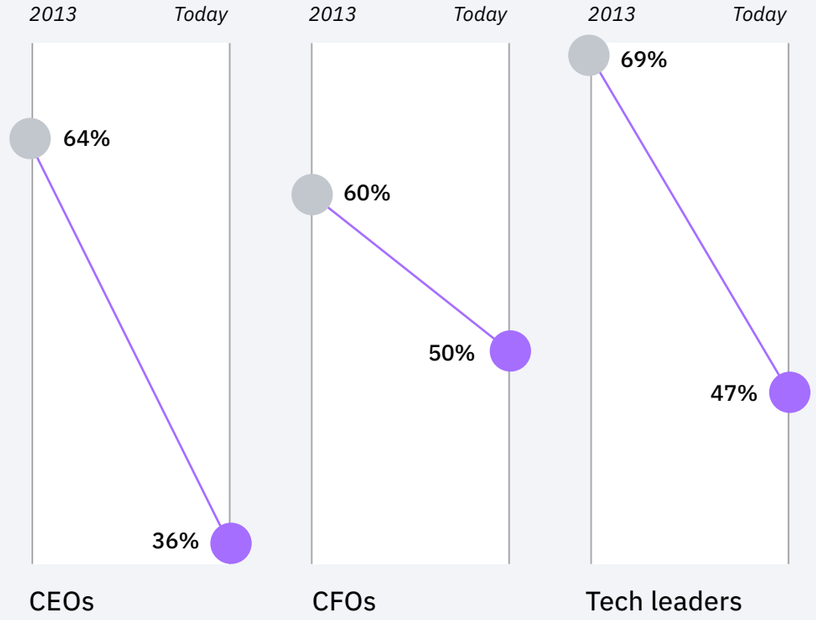
Alberto Rosa
CTO, CaixaBank

Figure 1

Slippery slope

C-suite leaders agree that IT has become less effective at basic technology services over the last 10 years.

Percent saying the IT organization is effective at providing basic technology services



Source: Rate the effectiveness of your IT organization in providing basic technology services. Percentages represent those CEOs, CFOs, and tech executives who responded effective or highly effective in IBM IBV 2013 and 2024 C-suite surveys. 2013 tech leaders is CIO-only data.

Beyond the org chart: A high-powered tech coalition

As technology permeates organizations, tech leadership roles have evolved, and new ones have emerged. But in an increasingly complex operating environment where data, security, operations, and infrastructure are more integrated, business and technology teams must come together to deliver a cohesive set of experiences, capabilities, and outcomes. Remaining in functional silos is no longer an option. CIOs, CTOs, and CDOs need to reinvent how they work together toward their organizations' shared business goals, building bridges in support of shared ownership and accountability.

At the same time, tech executives still need to divide and conquer, focusing on their areas of expertise.

Chief Technology Officers

CTOs continue to battle the balance between security and innovation. Generative AI complicates an already complex cyber threat landscape, exacerbating tension between protecting what has been built and pushing the boundaries of what's possible. Indeed, cybersecurity ranks second on CTOs' priority list, behind product and service innovation. The good news: core security practices—zero trust, secure by design, DevSecOps—are still the best defense.

Chief Information Officers

Amid shifting responsibilities, CIOs question the effectiveness of the IT function. A remarkable 63% admit their tech organizations are not very effective at leveraging workflows and automation to drive business strategy. But therein lies the opportunity. Winners are transforming in-house functions with the help of an augmented workforce where employees and AI combine to work smarter and faster.

Chief Data Officers

Data is no longer a domain unto itself but the nerve center that connects technology to the broader business and propels innovation. For most organizations, a robust data culture that can enable and support AI operations is still a work-in-progress. But taking an enterprise-wide view of the relationship between data and AI operations is essential. "Classifying the data problem as a technology problem is a bit unjust," says FuShan Hu, CIO at CHINT Group Co., Ltd. "It's a comprehensive problem and that's why data governance is so difficult."

Tech outperformers crack the code to success

Tech leaders juggle strategy, delivery, and support across data, security, operations, and infrastructure—all aimed at optimizing efficiency and competitiveness. Our research identified a high-performing group, comprising nearly 20% of our global sample, that excels in this mission.

Four critical capabilities and characteristics set tech outperformers apart

1

Effective strategy development and execution

Enabling a compelling strategic vision that drives business outcomes

2

Cross-functional collaboration to support tech investments

Working with business lines and finance to manage technology costs and budgets

3

A commitment to measuring outcomes and value

Partnering with finance to understand digital initiative value and alignment with enterprise strategy

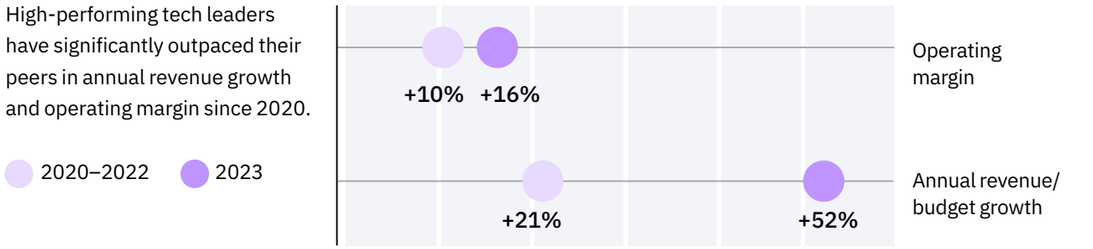
4

A sharp eye on tech at all levels throughout the organization

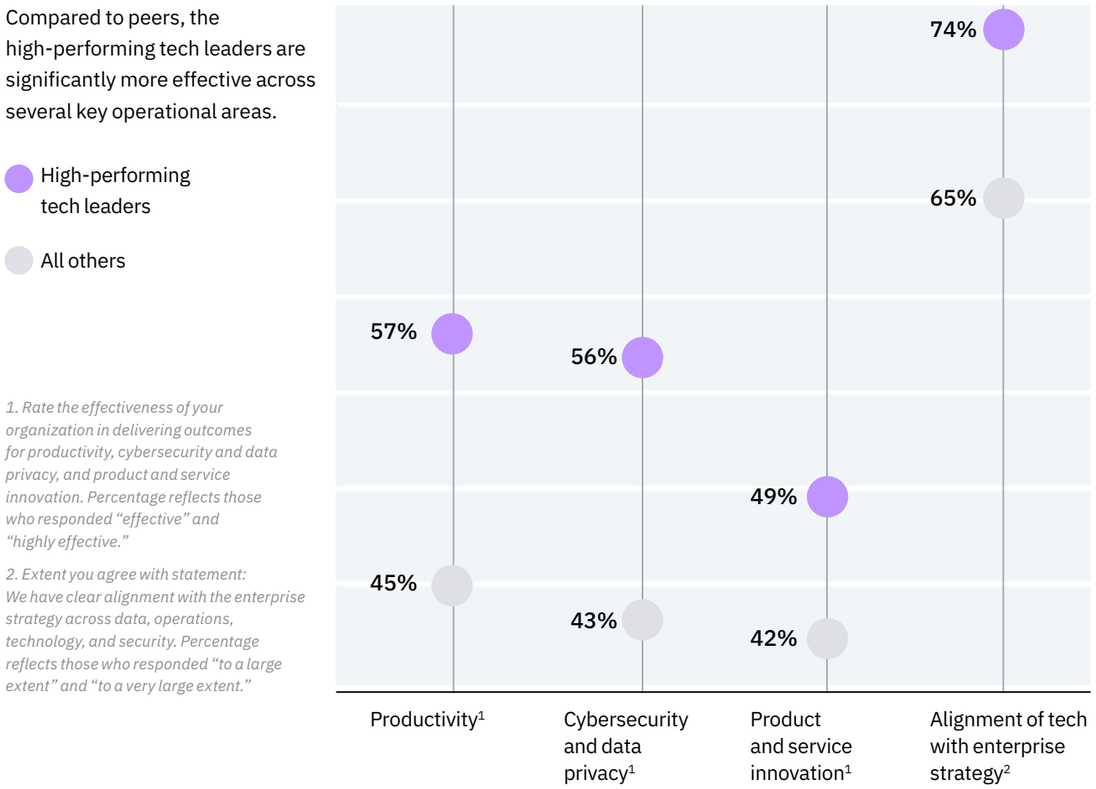
Maintaining keen visibility into all IT at decentralized, line-of-business, geography, and function levels

Where do high-performing tech leaders excel?

High-performing tech leaders have significantly outpaced their peers in annual revenue growth and operating margin since 2020.



Compared to peers, the high-performing tech leaders are significantly more effective across several key operational areas.



1. Rate the effectiveness of your organization in delivering outcomes for productivity, cybersecurity and data privacy, and product and service innovation. Percentage reflects those who responded "effective" and "highly effective."

2. Extent you agree with statement: We have clear alignment with the enterprise strategy across data, operations, technology, and security. Percentage reflects those who responded "to a large extent" and "to a very large extent."

"Deploying a generative AI capability has to be done in conjunction with complete wholesale business transformation … generative AI alone won't deliver the outcomes that a lot of CEOs are expecting."

Mark Breslin
Chief AI Officer, Informa PLC

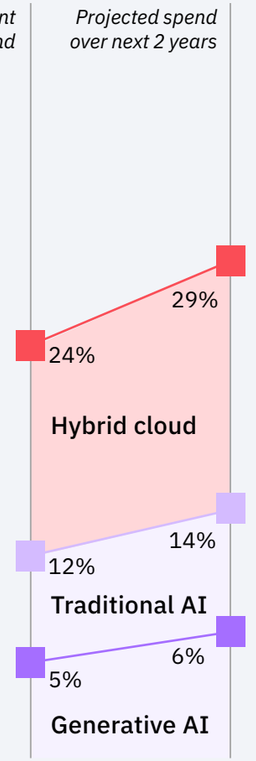
"Technology today as a stand-alone function does not make sense; technology is there to reimagine and power the business. And this requires a much closer integration and collaboration with business leaders."

Mohammed Rafee Tarafdar
CTO, Infosys

Perspective

Going all in on cloud and AI

Today, tech leaders are prioritizing infrastructure investments, spending nearly one-third more on hybrid cloud than AI. Looking ahead, they are fully committed to the power of cloud and AI together. Over the next two years, tech leaders expect to spend **half their budget** on the two combined.



Just as drivers are taught to identify blind spots to avoid crashes, tech leaders must recognize both when “objects in mirror are closer than they appear” and when risks may be hidden from view entirely. Executives adept at navigating hazards safely, and at speed, can be the difference between making technology the core of an organization’s competitive advantage and becoming a wreck on the side of the road.

The six blind spots

These six blind spots challenge longstanding assumptions about the relationship of technology and the business. Some risks may be closer than they appear, even for the most sophisticated executives. Tech leaders will need to look in their mirrors and make a compelling case to their C-suite peers for why these blind spots are holding their organizations back in the quest for AI advantage.

1 We treat tech as an enabler but...
Tech must be the core of everything we do.

2 We say we are working together but...
Our collaboration is only skin-deep.

3 We hope it will be a magic wand but...
Generative AI could break our organization.

4 We want it to be trustworthy but...
Our AI may be irresponsible.

5 We talk about data as currency but...
Our data could be a liability.

6 We think our team is strong but...
We’re still fighting yesterday’s talent battle.

We treat tech as an enabler but...

Tech must be the core of everything we do.

When organizations see technology as an enabler, they treat it like a toolbox. They wait for problems tech can solve rather than exploring what new opportunities it creates. Only when they recognize technology as the transformative force at the core of innovation can organizations seize first-mover advantages, define markets, and gain economies of scale.

"The biggest secret to digital transformation is to change your perspective. It's not about what you can do, it's about whether you can deliver value to your customers in a rapidly changing environment."

XiaoLong HE
CIO, VP of Digitalization, Tianshan Material Co., Ltd.

CEOs have spoken: product and service innovation is their top priority over the next three years. And 62% are willing to take more risks than competitors to maintain an advantage.[5]

But tech leaders have a confession: only 43% say their technology organizations are effective at delivering differentiated products and services (see Figure 2). And to add salt to the wound, 53% say other execs in their organization view tech as no more than moderately important to product and service innovation. This disconnect between technology and business suggests a massive change is needed.

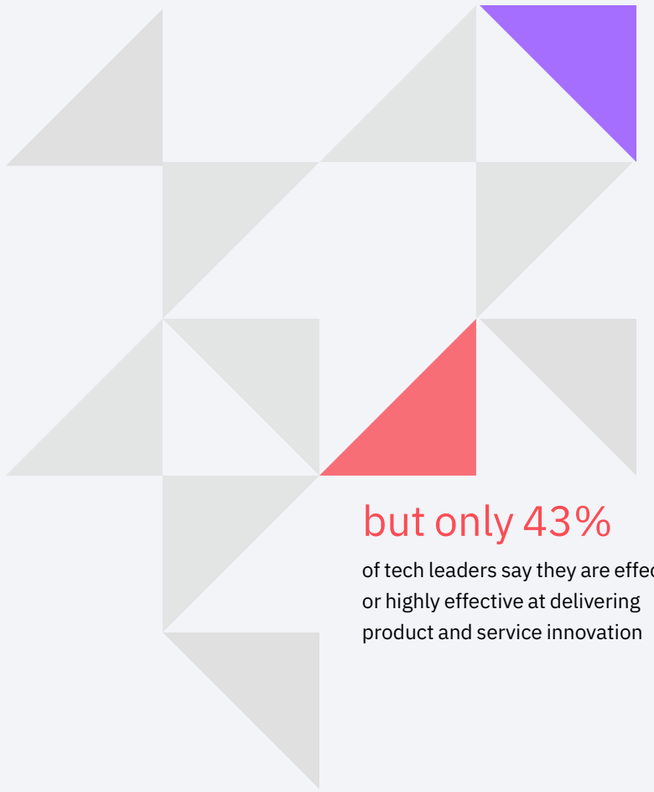
It starts with tech leaders positioning technology as essential to business outcomes. They say resistance to change among management and employees are top barriers to innovation, so tech leaders must amp up their outreach to the organization on what and how technology can deliver.

More importantly, organizations need a fresh, bold approach to innovation. A staggering 70% of tech executives say their organization is taking a fast-follower approach, adapting others' ideas or rolling out fixes rather than pioneering something radically new. Shayan Hazir, Chief Digital Officer of HSBC Singapore, observes, "We as technologists in financial services have tried to find problems for technology to solve, but I don't think we're spending enough time addressing what emerging technology can enable meaningfully for customers, communities, and economies."

Figure 2

Business awaits

Tech leaders are struggling to deliver CEOs' number one objective.



CEOs say product and service innovation is their

top priority

over the next 3 years

but only 43%

of tech leaders say they are effective or highly effective at delivering product and service innovation

To re-energize innovation for competitive gains, tech leaders must look ahead for technology-fueled big bets. They need to shift from a project emphasis to a customer focus, prioritizing outcomes rather than features as well as execution accompanied by customer validation.[6] They will need to avoid the ideation trap where many get caught: 73% of business executives say their greatest strength is researching customer needs or ideation, but only 27% say their forte is executing or scaling product plans.[7] Tech leaders must quickly bring the ideas to life.

That requires them to evangelize a culture for innovation—one based on pragmatic experimentation of high-potential ideas—and then work to bring the rest of the C-suite on board. They can call on CFOs to help define the most promising possibilities and to join them in leading C-suite conversations about the importance of innovation to the organization's broader strategy. They need to encourage senior leaders to look beyond near-term concerns such as efficiency, cost takeout, and modest incremental gains.

"We have this concept that we call open innovation because we cannot do all the innovation alone. Part of the work is finding the right partners."

Iosu Ibarbia
Technology Director, CAF (Construcciones y Auxiliar de Ferrocarriles)

“How do we leverage what’s good enough and push forward with it and then scale it? Traditional large organizations try to plan, strategize, and build a solution. And by the time you finish it, the technology and the landscape has changed.”

Jimmy Yeoh
CIO, DHL Express APEC

What to do

Escape the fast-follower treadmill by embracing revolution, not perfection.

Jump from the treadmill onto the launchpad.

- Create urgency for meaningful action that disrupts the impulse for incrementalism; pinpoint prudent precautions that encourage more confident risk-taking.
- Identify critical business problems to be solved by blending tech and business expertise on product and service development teams.
- Do the due diligence necessary to make leading practices real for your organization and define an investment strategy that takes necessary resource tradeoffs into account.

Break your analysis paralysis with generative AI.

- Use generative AI to synthesize customer feedback and analyze product usage insights to accelerate meaningful iteration.
- Establish a framework for evaluating and ranking potential solutions with generative AI. Ruthlessly cull efforts that don’t support your objectives.
- Develop KPIs to measure solution success and use generative AI to predict outcomes and simulate scenarios.

Embrace a digital product innovation approach.

- Establish a digital product innovation framework for ideation, prototyping, testing, and launch. Incorporate security and governance as design considerations from the outset.
- Break down silos between tech and the business to enable rapid iteration that delivers timely experiences and products to customers.
- Create incentives that reward experimentation and smart risk-taking for solutions that improve productivity and innovation.

Case study

IBM Software embraces gen AI for design[8]

IBM Software has defined an initiative around identifying the “top 10” set of workflows in which it is actively embedding generative AI. The organization is incorporating generative AI into products and processes, automating workflows, improving output, and accelerating design.

IBM Software is also training 100% of their designers in AI. In general, the designers find it invigorating to learn new skills and keep current with cutting-edge AI technology—and they love the prospect of spending more time on the creative aspects of their job that they’re passionate about.

In terms of synthesizing insights and crafting compelling content, IBM Design has seen a 12% average daily time savings for content designers. In addition to content design, the organization is investigating how to incorporate generative AI across product management, UX design, content design, and research.

“We are now studying what kind of gen AI use cases can have the greatest value to customers. Once we figure out the framework, and when we start to actually develop something, then we can invite some of our customers into the process.”

Hiroshi Okuyama
Director and Member of the Board, Chief Digital Officer
Group Divisional Manager, Yanmar Holdings Co., Ltd.

“I’ve spent the last 12 to 18 months building an enterprise-wide digital brain trust across our organization, bringing together multifaceted teams that have been exceptional within their own product category or technology area but are creatives at heart. These people are now the catalysts within their own business areas—they’re the ambassadors of change. When they go back to their day jobs, they infiltrate the mindsets of their teams.”

Shayan Hazir
CDO, HSBC Singapore

We say we are working together but...

Our collaboration is only skin-deep.

While finance and technology have a history of working together, that history masks critical gaps in planning processes and decisions that are disjointed or ill-informed. Only when the finance-tech relationship evolves from siloed to inseparable will they drive smarter decisions linking technology investments to quantifiable business outcomes and improving ROI.

"We believe in cooperative leadership. We build a leadership mindset that relies on the collective intelligence of the team rather than individuals."

Moritz Hartmann
Global Head Roche Information Solutions, Roche Diagnostics

The AI race is just beginning—and while it may not be won over the next two to three years, it can be lost over the next two to three quarters if finance and tech executives fall out of sync. While CFOs complain that tech decisions made in isolation by IT can lead to unsustainable costs, tech leaders know that shortsighted technology decisions can wreak long-term havoc. Their insights on technology are integral to their organization's strategic and financial decisions, while finance's input is critical to prioritizing technology investments.

A historically tense relationship must become more collaborative—not just through words but in deeds.[9] Two-thirds of CEOs say that a strong partnership between tech executives and CFOs is critical to their organization's success.[10] Technology leaders agree—CIOs, CTOs, and CDOs each rank the CFO as either the first or second most important relationship for driving their individual success. But the tech-finance relationship is still evolving from intention to practice. Only 39% of tech execs say they collaborate with finance to embed tech metrics into business cases. Similarly, only 35% of CFOs say they've been engaged early in IT planning to set expectations on how technology advances enterprise strategy.[11]

"There's no such thing as the business and IT. We're all one team."

Julia Knox
Chief Technology and Analytics Officer, Sobeys

"Technology decisions should be analyzed from a value perspective; what value will this decision bring to the business, the organization, and our clients."

Alberto Rosa
CTO, CaixaBank

However, our high-performing tech executives demonstrate the value of building a strong rapport between tech and finance leaders. They report notably stronger collaboration across key operational practices (see Figure 3). Our analysis also shows that when finance connects technology investments to quantifiable business outcomes, the high-performing group reports higher revenue growth.

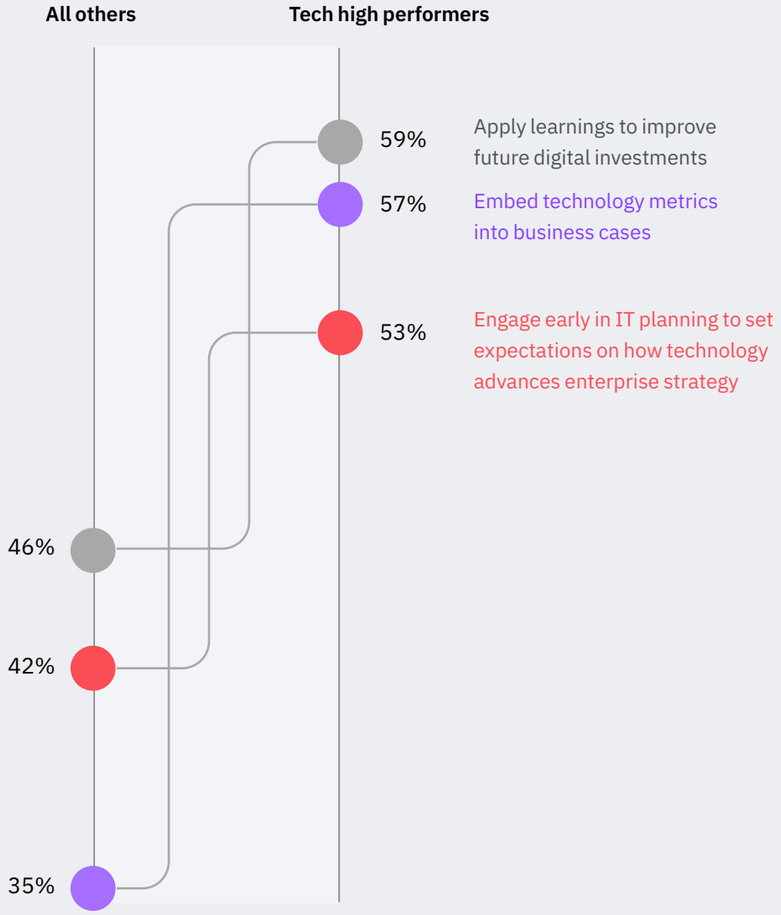
To drive organizational results like our top performers, tech leaders must pivot from informing to collaborating with finance—recognizing how finance can supercharge tech's influence across the C-suite. They need to make themselves indispensable to finance and demonstrate their commitment to fiscal responsibility.

At the same time, finance leaders need to meet tech halfway, looking beyond return on investment to understand how technology contributes to operational outcomes. Both sides should see the relationship as symbiotic, reinforcing mutual strengths so that it's greater than the sum of its parts.

Figure 3

The tech-finance tango

High-performing tech executives are partnering with their finance peers to align strategies and capture value.



“You need to be able to…collaborate more on the mid- and long-term objectives and stick to the strategy.”

Kristian Åkerström
xCIO/Head of IT & Digital, smart Europe

What to do

Align with finance to elevate your role as a strategic collaborator and advisor.

Engage in aggressive diplomacy across the C-suite.

- Develop a deep understanding of the organization’s financial drivers and leverage this knowledge to inform IT investment decisions.
- Identify and pursue ROI everywhere, including the financial and non-financial measures that are essential to tracking business objectives.
- Agree on a shared approach to creating and evaluating new technology investments for competitive advantage.

Make yourself indispensable to critical enterprise decisions.

- Seek opportunities to demonstrate the value of technical expertise in enterprise decision-making processes and engage allies to ensure your voice is recognized.
- Model your financial stewardship with a clear commitment to financial transparency and accountability. Seek ways to recapture costs to fund innovation efforts.
- Lead challenging organizational conversations, such as balancing the intense energy consumption of AI against organizational sustainability goals and commitments.

Show your work to build credibility.

- Frame technical discussions in financial terms, using data and analytics to demonstrate the value of IT investments and drive strategic decision-making.
- Quantify operational metrics in monetary terms. Gain greater fluency in financial performance metrics.
- Create a finance-facing dashboard that translates technology KPIs into financial measures (such as cost per user, revenue per customer, ROI).

Case study

The Standard rationalizes cloud costs by aligning IT spend with key business priorities[12]

Successful FinOps practices combined with Technology Business Management (TBM) exemplify the budding synergy between finance and technology. The disciplines of FinOps and TBM foster a collaborative culture that breaks down silos so organizations can translate cloud and other technology investments into value.

The Standard, a leading provider of financial products and services, is realizing the benefits of adopting these practices. Facing a lack of transparency on key drivers of technology spending, the organization's business and IT teams were not working together efficiently. The company was relying on a legacy ERP system and spreadsheets to prepare the budget, analyze financial data, and make decisions about technology investments—a manual and time-consuming process that was prone to error.

The Standard implemented an IBM Apptio® solution to build cost transparency, provide actionable insights, and enable faster decision-making. Adopting FinOps and cloud governance practices alongside the Cloudability product gave the company insights into its cloud spending—allowing it to drive greater accountability by enhancing cloud procurement and provisioning decisions. In addition, the Target process product helped the company improve its resource and program management—aligning team workstreams to business priorities, gaining greater visibility into consolidated workflows, and tracking dynamic variables like status, stakeholders, dependencies, and progress.

The Standard has realized significant benefits. It has increased business/IT alignment and financial agility, with the IT Finance team now able to focus 80% of its time on analysis, decision support, forecasting, and insights. The company has also gained more control over cloud spend, with projected savings of 10% in 2023 and even more in 2024. Additionally, the company improved its say:do ratio by 20%—a measure of the gap between what the IT organization says it will do and what it actually delivers. The company plans to continue investments in cloud governance to drive similar business results across the organization.

"I think that in the future, there will be no essential contradiction between Chief Technology Officers and CFOs because they will both focus on a common goal of the company's successful future. I think they are, for the most part, mutually supportive and cooperative relationships."

WeiWei Zhang
CDO, Tianshan Material Co., Ltd.

3

We hope it will be a magic wand but...

Generative AI could break our organization.

Because organizations hope generative AI will solve all their problems, they ignore the added stress it places on their existing infrastructure, among other things. Only when they address their technical debt and transition from a patchwork of systems to a purpose-built technology foundation can organizations fully embrace the shift from +AI to AI+.

"When you talk about the hardware and software stack, you are running into the issue of legacy things that you have to maintain. If you want to modernize it, it's easy to say, but on the implementation side, it's really difficult."

Tawatchai Cheevanon
Chief Product and Business Solutions, Krung Thai Bank

Nearly three in four CEOs say their organizations' digital infrastructure enables new investments to efficiently scale and deliver value.[13] But tech leaders have a different view. The scale and complexity of AI demands an infrastructure that supports its voracious appetite for data, compute, and storage. Only 16% of tech executives say they're very confident their current cloud and data capabilities are fully ready to support generative AI.[14] And 43% say their concerns about their technology infrastructure have increased over the past six months because of gen AI (see Figure 4).

Even more concerning: other IBM IBV research reveals that only 29% of cloud IT assets and services are performing as required. The remaining 71% is essentially tech debt accumulated over years of piecemeal technology implementations.[15] This burden is forcing organizations to divert energy and resources toward maintaining and troubleshooting outdated, disparate systems—not executing bold ideas and future-focused initiatives.

"When something suddenly becomes very important, but the foundation is not in place, then there's a lot of internal transformation we need to do to catch up."

Pochara Vanaratseath
Head of Information Technology Group, Krungsri Bank

Figure 4

Unfit for AI

Many organizations don't have an AI-ready technology infrastructure.

Nearly

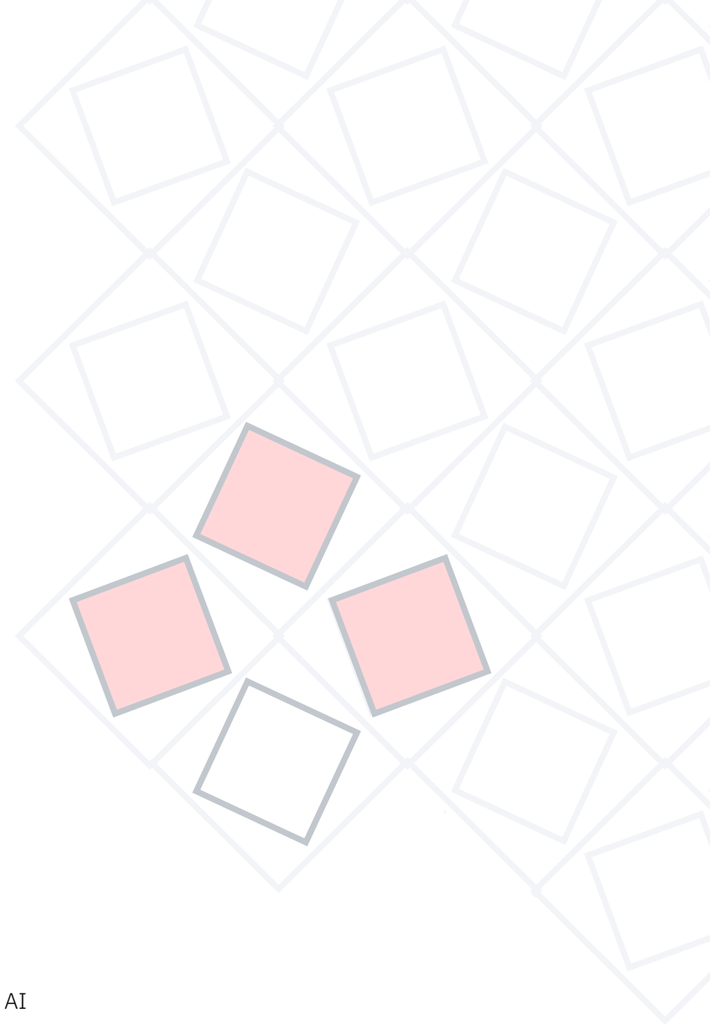
three in four

CEOs say their organizations' digital infrastructure enables new investments to efficiently scale and deliver value.

But

43%

of technology executives say generative AI has increased their infrastructure concerns.



Tech leaders must tackle this weakness head-on, starting with a reality check for other C-suite leaders. To catalyze AI transformation, organizations need a thoughtful infrastructure renovation, repurposing what's useful but also investing for the future. They need an architectural framework that helps intentionally optimize business value through technology while addressing the entire technology estate: platforms, security, AI, cloud, and data. The goal is to build a launchpad that brings together disparate technologies and can support the business for years to come.[16]

Daimler Trucks Group CIO Marcus Claesson recognizes the value of modernizing architectures and operating models. Since Daimler Trucks spun off from Mercedes-Benz, Claesson's team has been rigorously rethinking and replacing outdated technology and redefining how work gets done—not an easy undertaking. "It's like going to the gym. It's difficult and painful," he says. "But we come out in better shape with a better foundation for the future of the company."

As tech leaders ready for gen AI, infrastructure is wisely their top priority investment. In fact, organizations are actually allocating more toward hybrid cloud than AI itself: 24% of their current spend versus 18% for traditional and generative AI. As part of this focus, careful selection of cloud partners becomes crucial to avoid risks such as vendor lock-in—a concern shared by two in three tech leaders who are proactively identifying partner risks.

An AI-optimized infrastructure isn't a one-and-done proposition. Tech leaders need to put in the work to align investments to business outcomes—with an eye to minimizing the overhead associated with current technical debt and optimizing existing resources and capacity to free up funds for AI innovation.

> "You may deliver the technology, but if the business is not ready or the business is not along on the journey, nothing moves."
>
> **Jimmy Yeoh**
> CIO, DHL Express APEC

“The role of the CTO in organizations should be centered around defining clear principles and risks of technology, creating a robust architecture model that can manage the increasing complexity.”

Alberto Rosa
CTO, CaixaBank

What to do

Rethink your technology strategy to support AI readiness.

Make paying off technical debt a business imperative.

- Refactor legacy systems for AI readiness. Reframe legacy infrastructure challenges as business impediments preventing rapid gen AI adoption at scale.
- Rationalize applications and services based on criticality and potential for AI-driven transformation. Identify what is no longer relevant versus what can be sustained for now.
- Use gen AI code assistants to modernize applications for hybrid cloud and AI.

Optimize your infrastructure for AI everywhere.

- Review the current state of your infrastructure with an eye toward AI everywhere. Factor elements including compliance and energy consumption into readiness assessments.
- Develop an AI transformation roadmap based on what’s needed to solve critical business problems. Draw lessons from cloud and design for security from the outset.
- Optimize cloud infrastructure for AI workloads that process and analyze large data sets.

Unite your cloud and AI partnerships.

- Pick partners that share your values and goals. Assess partners against clearly defined infrastructure requirements, including security and compliance.
- Move on from use cases and pilots. Understand how partners enable and support industrial-scale AI operations on hybrid cloud.
- Reorient your hyperscaler relationships by identifying and eliminating those in your ecosystem that do not accelerate your transition from a +AI to an AI+ model.

Case study

Audi creates a stable, scalable environment for development across cloud platforms[17]

Audi needed to create a stable, scalable environment for innovative development. This required them to provision project environments faster to be able to build, deliver, and scale diagnostics, data management, and other projects across clouds. Audi also sought to reduce risks and remove dependencies with a flexible, modular architecture that could support iterative work.

Audi created a new as-a-service development environment based on Red Hat® OpenShift®, enabling Audi's platforms, applications, and projects for innovative development at scale.

Audi reduced time to market by up to six months. With a common foundation, developers were able to work more efficiently to create, deliver, and migrate solutions across on-premises and cloud environments. Application scalability improved to meet demand.

"Today, we must concern ourselves about the products we can deliver. And, we must make sure we don't have a big chunk of tech debt. IT leaders must always modernize."

Hong Giep Toh
CIO, Singapore Land Authority

We want it to be trustworthy but...

Our AI may be irresponsible.

When organizations think their AI is trustworthy, they underestimate how it amplifies the risks associated with trust and privacy. Only when they shift from a reactive risk posture to a proactive culture of integrity will they build distinctive trust, position themselves to seize opportunities others are unprepared to pursue, and achieve meaningful differentiation at scale.

"My goal is to make sure that my customers can sleep soundly at night knowing that they're protected and that they can continue to trust me as an institution."

Ian Cramb
COO, UBP

In a market saturated with AI-powered products and services, public trust is declining.[18] So it's not surprising that nearly three in four CEOs (71%) say establishing and maintaining customer trust will have a greater impact on their organization's success than any specific product or service.[19] And for the majority (80%) of CEOs, transparency in their organization's use of next-generation technologies such as gen AI is critical for fostering that trust.[20]

What CEOs may not realize—but tech executives know—is that their foundation for trustworthy AI is shaky. While 65% of tech leaders say they have governance in place for AI workflows, they acknowledge that they aren't delivering on key responsible AI practices such as explainability, transparency, fairness, and privacy (see Figure 5).

"Before implementing a comprehensive AI strategy, it is crucial to consider the governance issues surrounding it, as well as the applicability of legislation to your specific environment."

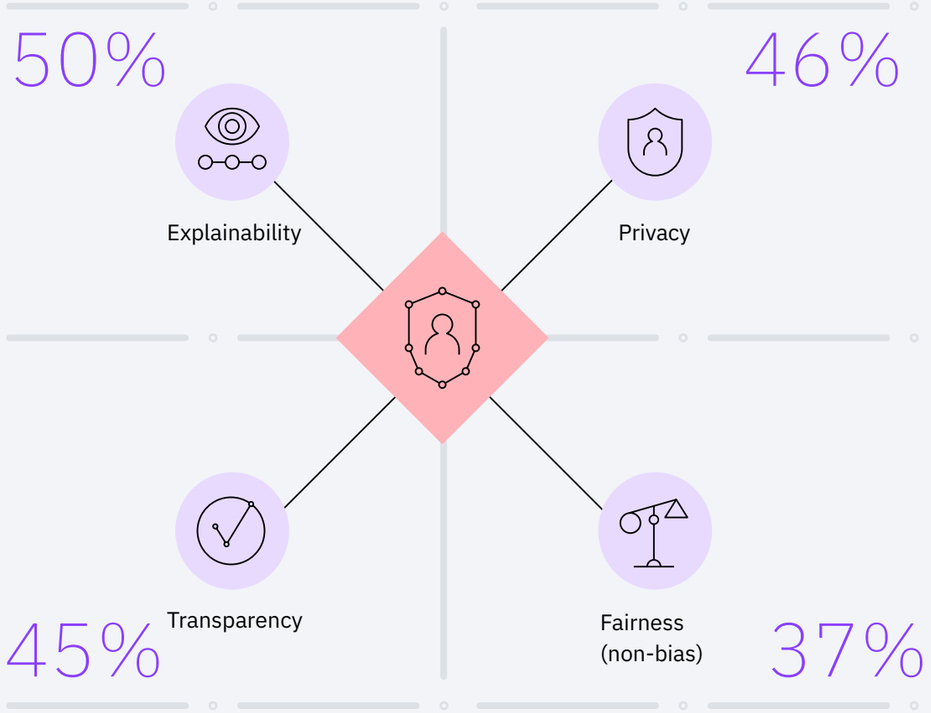
Nthabiseng Mosupye
Chief Technology Information Officer, Rand Water

Figure 5

Falling short

Most organizations aren't delivering core responsible AI capabilities at scale.

Percent of organizations delivering capabilities to a large/very large extent



Responsible AI is no longer a choice. It's a cultural imperative. Widespread AI adoption pulls back the curtain on an organization's data, processes, and decision-making, helping stakeholders see more of what's happening. But it may also expose too much to competitors, so tech leaders need to balance transparency with discretion by developing a purposeful strategy that recognizes visibility into its use of AI as a competitive opportunity.

Tech executives must also consider and communicate the risks of scaling AI beyond just a use case to full-blown integration into employees' daily lives organization-wide. With AI everywhere, breaking rules is child's play. Any employee can expose confidential data in a public model or misuse an AI-powered tool because they don't have proper training.

"We should give technologists a leading voice to help people understand the security implications, the privacy implications, the other societal implications," says Ed McLaughlin, President and CTO, Mastercard.

Finally, tech leaders need a new mindset on risk. A cautious wait-and-see approach results in missed opportunities and falling behind competitors. "We can shift our perspective on risk so that it can serve as an enabler of great delivery and great technology solutions," notes Julia Knox, Chief Technology and Analytics Officer at Sobeys. Emerging regulations such as the EU AI Act define degrees of risk and help organizations understand where to focus.[21]

Poised at the helm, tech leaders can attack AI risks head-on to turn potential liabilities into differentiating advantages. Developing a responsible AI framework, investing in AI ethics, and providing AI training and education are just a few of the steps they can take. Being proactive helps build trust with stakeholders while finding that sweet spot between the risks and rewards of AI.

“With generative AI, we are seeing new regulations. The aspects relevant to responsible AI are evolving along with the technology. So we are moving toward a model of how do I manage the risk?”

Mohammed Rafee Tarafdar
CTO, Infosys

What to do

Recognize your outcomes are only as strong as your values.

Build bridges, not walls.

- Communicate openly about your values and approach to responsible AI development and deployment.
- Be transparent about data collection practices and how you protect personal data. Have clear lines of accountability and processes for supporting customers.
- Acknowledge how generative AI impacts experiences and engage with customers, employees, and other stakeholders to address their concerns and questions.

Be a champion of responsibility.

- Refocus on the risks of scaling and AI “drift.” Define what you must control and defend where you lack leverage.
- Make technology a leading voice in responsibility and accountability. Educate employees on AI ethics and the responsible use of AI.
- Build a more diverse workforce to support development of unbiased data and models.

Make AI risk your ally.

- Purposefully position the organization to seize opportunities while others chase compliance. Document everything to accelerate governance policies and controls.
- Engage with your local jurisdiction leaders and industry associations to advocate for AI regulations that balance public and private interests.
- Pick business partners with the right values and capabilities to deliver responsibly and effectively. Incorporate responsible computing principles into procurement contracts.

Case study

IBM system translates to more compliance, less work[22]

Managing responsible AI is easier said than done, given the anticipation of a large influx of regulations. IBM strives to keep AI a positive force for change, and that means holding itself accountable to the AI principles the company has established. The IBM Office of Privacy and Responsible Technology had seen a similar situation with GDPR compliance. They built the Privacy and AI Management System (PIMS) to handle global oversight of GDPR and other privacy regulations. Now they have augmented the tool to help document and track compliance across AI operations as well. The upgraded PIMS offers a centralized, company-wide platform to capture, integrate, and make transparent the metadata related to data privacy and the entire AI lifecycle, from design to deployment to everyday use.

PIMS registers new instances of AI that are put into production by IBM and instances of other algorithmic systems. PIMS adds them to a centralized, company-wide workflow and assesses them for potential risks. And once the model is live, the solution provides ongoing monitoring for fairness, quality, and drift.

At the same time, as new regulations are passed, PIMS can be used to import these requirements, updating governance models and overall risk assessment efforts. “Rather than having every asset, every individual, every application, every business process monitored by the process owner—and forcing them to work out what laws need to be complied with—we mask that complexity,” explains Lee Cox, Integrated Governance & Market Readiness, IBM Office of Privacy and Responsible Technology (OPRT). “With PIMS, now they only have to focus on the automatically generated remediation tasks. That translates to thousands of hours of effort saved across all of IBM.”

Perspective

Green IT in the age of gen AI

> “As an executive, I need to be an expert on sustainability.”
>
> **Greg Lavender**
> CTO, Intel

The impact of gen AI on sustainability is a double-edged sword. On the one hand, the technology supports sustainable development by optimizing resource usage, reducing waste, and improving efficiency. It can also help organizations efficiently manage their sustainability reporting and compliance.[23] Recent IBM IBV research found that executives are starting to apply gen AI capabilities to application development and green coding initiatives as well as data center layout—critical pieces of sustainability programs.[24]

But tech executives are also realizing that the development and deployment of AI models requires significant energy expenditures. This contributes to greenhouse gas emissions—a point of concern for 82% of tech executives.[25] The increasing electricity demand for data centers highlights the need for energy-efficient methods to train, tune, and run AI models.[26]

Tech leaders see that business value in sustainability extends beyond the tech stack and tech function: most are prioritizing energy-efficient tech solutions (75%) and collecting data to track progress toward sustainability (69%). Not only is this commitment important for their own operations, it drives broader bridge-building to their CFO and CEO counterparts, who are responsible for sustainable investments and public shareholder filings. Indeed, 74% of tech executives describe environmental sustainability as more of an opportunity than a risk. Prioritizing sustainable practices in AI development and deployment positions organizations to have an impact beyond their environmental footprint.

We talk about data as currency but...

Our data could be a liability.

When organizations focus on data as currency, they fail to take the critical steps necessary to transform their dirty distributed data into a consistent end-to-end asset. Only when organizations commit to moving data management from backstage to top billing do they establish a corpus of integrated trusted data that frees them to explore the art of the possible with AI.

"Generative AI has allowed us to lower barriers between business units by sharing business unit-owned data."

Kazushi Kuse
Executive Vice President, Asahi Kasei Corporation

Two-thirds of CFOs say their C-suite has the data needed to quickly capitalize on new technologies.[27] Tech execs say not so fast. Only 29% of tech leaders strongly agree their enterprise data meets the quality, accessibility, and security standards that support the efficient scaling of generative AI (see Figure 6). In fact, for 45%, their angst about data accuracy or bias has increased in the last six months because of gen AI.

Enterprise data may appear integrated on a screen, but beneath the surface, collection and integration are often cobbled together manually. This prevents detailed analysis and risks stoking distrust and a retreat to silos. Too few organizations have implemented critical data capabilities such as a data fabric architecture (48%), enterprise data standards (42%), customer (46%) or product (35%) master data, or a common data model (44%). Without these, it will be difficult for an organization's data to support aspirations for production-level, industrial-scale AI.

It's past time for technology leaders to escalate the data management discussion beyond their own circles and into the enterprise spotlight. One way to bring all the parties to the table is to collaborate on governance, risk, and compliance (GRC). GRC provides a structured approach for aligning IT and the business.[28] It standardizes data management around a set of core practices. For example, data is not necessarily a technical asset; it's a business asset that requires ownership and accountability within the business functions.

Figure 6

Data disconnect

CFOs' certainty is overshadowed by tech execs' doubts.

67%

of CFOs say their C-suite has the data necessary to quickly capitalize on new technologies.

but only

29%

of technology leaders strongly agree their enterprise data has the necessary quality, accessibility, and security to enable efficient scaling of gen AI.

Likewise, data quality issues often stem from inadequate data governance, not technical limitations. GRC requires a focus on processes, policies, and procedures enterprise-wide to drive data accuracy, completeness, and consistency. Ipek Ozsuer, Chief Digital & Information Officer, dsm-firmenich, notes that governance is paramount to making data a differentiator. "You must have strong visibility into your own data, manage it right, then turn that data into a competitive advantage," she says. "That's why governance becomes very, very important."

Data-related risks, such as breaches or regulatory exposures, are also addressed by a GRC-driven, organization-wide focus on risk and compliance management. This includes identifying and managing cybersecurity threats as well as educating employees on risks and policies.

High-performing tech executives are implementing effective data management practices for positive business results. Mature GRC practices position organizations to turn data management into a competitive differentiator. They can pivot more effectively as new AI regulations continue to emerge, and they can create value more quickly and efficiently from their data.

> "Data privacy and cybersecurity are now more important than ever. As technology leaders, we have to collaborate to build the technology practices and infrastructure that allow for responsible and secure AI operations."

Marwan Bin Haidar
EVP Innovation & The Future, DEWA

“If you’re talking about the data, security is something that we cannot compromise. That is most critical. Whatever we do together, the data has to be secure.”

Tawatchai Cheevanon
Chief Product and Business Solutions, Krung Thai Bank

What to do

Purposefully pursue effective data management.

Talk about outcomes, not about data.

- Focus on shared objectives by finding a common language with the business based on enhancing the customer experience and delivering outcomes.
- Use storytelling and scenario-based exercises to drive tech and the business to a shared understanding of the customer journey and pain points.
- Identify key business metrics and outcomes that are critical to the organization’s success at both the enterprise and the business unit level.

Drain your data swamp.

- Pivot from collecting more data to curating the most important data, starting with a clear vision and strategy for data curation, aligned with business objectives.
- Expose the current data landscape and its limitations, highlighting the gaps between business needs and data capabilities.
- Develop a roadmap for data curation, including milestones, timelines, and resources required. Emphasize the business case for investment in each stage of data management.

Accelerate your speed to decisions.

- Leverage tech to make data insights easily accessible and understandable to the people who need them and can act on them. Design interfaces that enable reliable analysis.
- Establish a unified data governance framework to define how your organization collects, organizes, stores, prepares, and uses its data for each level of decision-making.
- Improve data visibility by creating a data catalog that provides a centralized inventory of available data, including metadata, data quality, and usage information.

Case study

Samsung Electro-Mechanics leads with trusted data[29]

Samsung Electro-Mechanics, a leading electronic components manufacturer, struggled to manage vast amount of data generated from various sources, including production inputs, facility data systems, and yield analysis systems. The data was scattered across different systems, making it difficult to locate, standardize, and use quickly and efficiently.

In search of a solution that would help the company integrate and manage data in a scalable and secure manner, Samsung Electro-Mechanics chose an IBM Cloud Pak® for Data and IBM Watson® Knowledge Catalog solution to build a robust data platform. The platform allows for data integration, observability, master data management, and data governance and security. The company was able to connect its data sources, including Impala, SAP HANA, Oracle, and MS SQL, and create a centralized data repository.

With self-service functionality, the platform improved data accessibility and reduced the time for users to complete tasks from 30 days to 10 days or less. It enhanced data governance by enabling the company to manage personal and sensitive information according to its strict governance principles. And it has been able to scale data management: the solution grew from connecting five or six data systems to more than 20.

"We are trying to overcome the challenges of gen AI by creating the data governance and control framework so that our stakeholders are satisfied with the infrastructure, the LLMs [large language models], and the explainability while avoiding hallucinations."

Arun Mehta
CDAO, Head of Analytics & AI, First Abu Dhabi Bank (Bank FAB)

"We now have the rule that all data owners must share their data with anyone who wants to use the data in our organization. This speeds up the use of data—and the combination of data. People can start experimenting faster instead of going through committees."

Hauke Stars
Member of the Board, IT & Data, Volkswagen AG

We think our team is strong but...

We're still fighting yesterday's talent battle.

Because organizations are still fighting yesterday's talent battle, they become mired in workforce development efforts that deliver, at best, incremental productivity gains. Only when they prioritize an operating model that recognizes critical expertise and puts human-machine partnerships at the center of innovation do they unleash self-reinforcing cycles of innovation and growth.

"AI empowers and then multiplies the abilities of talented people."

Pere Nebot
CIO, CaixaBank

Two-thirds of CEOs say their teams have the knowledge and skills to incorporate new tech such as generative AI.[30] Only half of tech leaders share this optimism. For generative AI expertise specifically, 40% of tech executives say their anxiety has increased over the past six months. On the front line with their teams, tech leaders face a vexing reality when it comes to talent.

Nearly six in ten (58%) say they are struggling to fill key roles (see Figure 7). And they don't expect long-standing talent shortages in critical areas to get better any time soon. Over the next three years, they anticipate skill scarcities to increase in cloud (+36%), AI (+29%), security (+25%), and privacy (+39%). At the same time, they expect 30% of their existing technology workforce will need retraining or reskilling over the next three years.

Tech executives know their workforce is critical. Nearly two in three (63%) say their competitiveness will hinge on their ability to attract, develop, and retain top tech talent. But it competes with other priorities on the agenda; more than half (54%) of tech executives blame financial pressures for hindering their ability to invest in technology talent.

"How do we help people be better at what they do through data and technology? We are focused on how to help people be more productive, and gen AI plays an important role here."

Christopher Wright
Head of Information Technology and CIO, Nestlé

Figure 7

The tech talent divide

CEOs are confident;
tech leaders are challenged.

66%

of CEOs say their teams have the knowledge and skills to incorporate new tech such as generative AI.

but

58%

of tech leaders say they are having difficulty filling key technology roles.

"What are the things that humans could never do? We're not actually automating the toil that was there before. You can now create capabilities and value that were never possible."

Ed McLaughlin
President and CTO, Mastercard

Tech leaders need to spark an epiphany across their organizations: the future of work isn't just about finding more people—it's about unleashing the full potential of existing talent. This requires radically rethinking roles, learning pathways, and work processes.[31] It's about fundamentally changing the operating model to harness the power of new technologies and innovative ways of working.

According to IBM IBV research, organizations that prioritize operating model transformation over workforce skills development outperform peers. This means adopting agile methodologies where teams work toward goals rather than ticking off tasks. It involves investing in reskilling and upskilling versus outside hiring. It means scrutinizing processes and job roles to identify areas ripe for change. And it involves leveraging data to reimagine processes and turning to ecosystem partners to plug skills gaps—a tactic many tech leaders (69%) are already embracing.[32]

These strategies reorient organizations around a revamped operating model where productive human-machine partnerships can thrive. Generative AI opens the door to radically transformed technology operations by augmenting tech teams with critical time-saving capabilities. It helps with developing faster, higher quality code, automating labor-intensive tasks, streamlining knowledge sharing and transfer, and simplifying complex tasks such as log inspection. These advances free professionals to focus on skills that are critical for working person-to-person in the AI era: creativity, empathy, and complex problem-solving.

Tech leaders have full plates—it's easy to see how talent challenges get pushed to the side. But in a marketplace where technology is essential but alone does not deliver sustainable differentiation, aligning tech and talent with an eye toward the future is what creates lasting advantage.

“The role of the CIO is not technology-centric anymore. You need to be a people person as well, understand your team, how to put the right person in the right job.”

Pochara Vanaratseath
Head of Information Technology Group, Krungsri Bank

What to do

Prioritize a people-centric approach to technology operations.

Redefine the roles and skills needed in tomorrow’s enterprise.

- Lead your organization to explore what the fusion of talent and tech can do that is net new and creates fresh sources of growth and transformation.
- Reject the automation of bad or outdated processes. Use process mining to analyze how work is done and where bottlenecks or inefficiencies can be eliminated.
- Redesign job roles to reflect new ways of working that amplify the strengths of people and machines performing together.

Corner the market on the talent you need.

- Develop strategic partnerships that leverage complementary skills and expertise. Keep high-value skills in house and leverage partners for easier-to-source skills.
- Tap partners for exceptional talent with high-demand skills and to manage capacity fluctuations.
- Identify and invest in the critical indirect areas necessary to maintain effective operations and drive growth.

Deliver irresistible employee experiences.

- Develop a comprehensive employee experience strategy that includes technology, culture, and processes.
- Let your workforce define how they use AI to help them work better and faster.
- Turn reskilling and upskilling into advancement opportunities. Establish AI academies or centers of excellence where employees can develop their proficiency.

Case study

Creating the future of human resources[33]

What are the key roles people must play in the augmented workforce? And how can HR optimize human-machine partnerships?

Integrating AI and automation into daily work is not necessarily easy. But IBM HR is blazing a trail. From creating a next-level digital assistant to streamlining IBM's promotion process, the organization knew technology could save employees time and make it easier for them to deliver on strategic goals.

Pulling data for thousands of employees—stored in multiple massive spreadsheets—into a single, unified system got the ball rolling. With this data in hand, IBM HR was able to use a digital worker to compile employee data into a dashboard that managers could use to assess performance and help employees make progress toward personal goals. The digital worker gives managers the information they need to make smarter, faster decisions—it doesn't make the decisions for them.

In one North America pilot, IBM HR saw impressive time savings. They were able to reduce the time it took each manager to nominate employees for promotions from eight hours to one hour—a total reduction of roughly 12,000 hours per quarter. As a result of this success, IBM has started to roll this digital assistant out to other regions—with potential time savings estimated at up to 50,000 hours per year.

Automation also reduced the process from 10 weeks to six weeks, which allows the HR support team to focus more on coaching individual managers. Plus, they can now analyze the data from the nominations to provide insights to the wider enterprise. This solution exemplifies how automation and AI can move humans up the value chain while significantly accelerating decision-making.

"One piece of wisdom that comes back again and again is: clear roles, clear goals, and clear accountability. If you hire people with ill-defined goals, ill-defined roles, and you don't enable and support them in achieving what they need to achieve, no wonder they fail."

Greg Lavender
CTO, Intel

Perspective

Doubling the tech talent pool: Advocating for women in AI

Gen AI is creating new urgency around the lack of women in the historically male-dominated field of IT. In the 2024 IBM IBV annual women's study, 67% of female executives said there aren't enough women leading conversations about generative AI. When bias plays out as harmful or inaccurate AI model outputs, a diverse workforce becomes a safeguard for improving trust and brand equity.[34]

"If 70%, 80% of IT professionals are men, it's obvious that AI is going to be coded with bias," notes Marisa Reghini Ferreira Mattos, Chief Technology and Digital Business Development Officer at Banco do Brasil. "And if I bring more women to AI, in addition to breaking the bias, they will bring a more observational side, a more sympathetic side, a holistic side ... so the potential is enormous."

Almost half of women in the annual IBM IBV women's study are concerned that AI-driven automation will replace them.[35] The AI revolution presents an opportunity for women to change the conversation, taking the reins to help identify potential problems with AI while also demonstrating the value they bring to the tech leadership discussion. Tech leaders need to encourage women to become IT and AI subject-matter experts to not only increase the talent pool, but to gain the critical perspectives that will shape AI transformation going forward.

"And if I bring more women to AI, in addition to breaking the bias, they will bring a more observational side, a more sympathetic side, a holistic side."

Marisa Reghini Ferreira Mattos
Chief Technology and Digital Business Development Officer
Banco do Brasil

"With the emergence of gen AI, tech leaders are in the driver's seat. But the accelerator is stuck to the floor, so we have to steer as much as we can, while trying not to step on the brakes too much."

Hong Giep Toh
CIO, Singapore Land Authority

"Each board meeting, I use the opportunity to talk about a positive impact of IT on the business. This helps to increase the understanding of the importance and impact of IT."

Hauke Stars
Member of the Board, IT & Data, Volkswagen AG

The AI revolution is underway

Tech leaders must be honest with themselves and others to navigate AI's challenges and unlock its opportunities.

In the AI era, the stakes are high and the influence of tech leaders is even higher. AI is transforming the very fabric of business—from reimagining the way people work, to how leaders weigh options and place bets, to reinventing customer experiences and relationships. But to get there, tech executives must lead their organizations past the blind spots hindering their AI transformation.

They will need to orchestrate critical conversations that synthesize technology and business to push the performance envelope—balancing the need for speed and innovation with the realities of governance and fiscal responsibility. This is not a time for incremental thinking. Today's technology leaders must be bold and visionary to give life to a winning strategy. It requires a shift from tech silos to business drivers, from risk-averse thinking to risk-savvy decisions, and from fast followers to innovators and difference makers.

Much as cloud revolutionized the approach to industrial-scale computing, the emergence of gen AI and AI for business represents a career-defining moment for technology leaders. Tech executives who successfully harness AI's power with responsible and trustworthy solutions will propel their organizations ahead of the competition.

Research methodology and analysis

The IBM Institute for Business Value (IBM IBV), in cooperation with Oxford Economics, surveyed 2,500 C-suite technology leaders, including Chief Technology Officers (CTOs), Chief Information Officers (CIOs), and Chief Data Officers (CDOs) during Q1 2024. Respondents spanned 26 industries and 34 locations worldwide.

Separately, a small group of executives was engaged for in-depth, qualitative interviews. These discussions focused on key insights from the study and the executives' on-the-ground experience leading technology for organizations in the new era of AI. This provided invaluable perspectives on the challenges and opportunities of developing and delivering AI-oriented technology capabilities at scale.

The IBM IBV data analytics team performed a series of in-depth analyses and data transformations to uncover deeper relationships between complex and emergent phenomena, such as which behaviors drive specific benefits and which factors are accelerating the realization of AI value. As part of this data analysis, a group of high-performing technology organizations was identified, corresponding to clear-cut performance on a variety of financial and operational measures.

Those in this group are more likely to excel in strategy development and execution, exhibit strong collaboration between business and finance leaders when it comes to technology investment decisions, place an emphasis on measuring outcomes and value from their digital initiatives, and have comprehensive visibility into how technology is enabled and supported across the organization—whether at the line-of-business, geography, or functional levels.

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