

# Top Risks and Challenges CTOs Face When Implementing Technology Strategy

Published 26 February 2024 - ID G00804785 - 9 min read

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Initiatives: [Technology Innovation and Strategy Leadership](#)

CTOs are accountable for investing in new technologies and delivering the enterprise technology strategy. However, they face many risks and challenges. This research reports on the top risks and challenges that CTOs encounter and advises on how to overcome them.

## Data Snapshot

Figure 1: CTO Risks and Challenges With Technology Strategy Implementation

### CTO Risks and Challenges With Technology Strategy Implementation

Multiple responses



n = 403; excluding not sure

Q. What are the risks and challenges that the CTO at your organization faces as they implement technology strategy?

Source: 2023 Gartner Changing Role of the CTO Function Survey

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## Data Insights

Data from the 2023 Gartner Changing Role of the CTO Function Survey, <sup>1</sup> shown in Figure 1 above, indicates that most CTOs face a range of challenges when implementing technology strategy. The top five, which we'll address in this research, are:

- **Talent management.** Talent constraints are increasing for over a third of the CTOs we surveyed. This is a widespread problem — there were no significant variations by company size, although APAC CTOs were more likely to report this as a challenge than those in North America and EMEA. We hypothesize this may be partly caused by the fact that some APAC countries have smaller and less mobile talent pools, compared to large regions such as the U.S. or the EU. CTOs should review their talent management and acquisition process and seek opportunities to use technologies such as AI to reduce the need for some critical skills.
- **Cybersecurity.** Over a third of the surveyed CTOs reported that mitigating cybersecurity risks is a challenge. Technology innovation may exacerbate cybersecurity challenges because new technologies can introduce new risks. Also, cybersecurity was rated as a lower risk by those organizations with a formally structured CTO organization (as opposed to those with informal CTO organizations or no established CTO organization). This is likely because more formalized CTO organizations tend to have more mature and effective cybersecurity practices. CTOs with cybersecurity responsibilities must be prepared to invest more in the area and should also seek more effective approaches to cybersecurity such as Gartner's continuous threat exposure management process.
- **Vendor selection.** Many vendors face increasing competitive and commercial pressure, which may cause them to change strategies unpredictably. Even large, established vendors can discontinue major services with limited notice; for example, Google's Internet of Things (IoT) cloud service, IoT Core, was discontinued in 2023.<sup>2</sup> Such factors contribute to the 35% of CTOs who highlighted vendor selection as a challenge. Unsurprisingly, CTOs in organizations moving toward a more decentralized technology strategy rated this as a more serious issue, because in such cases, the CTO will have reduced visibility and control of vendor choices. CTOs must ensure they're involved in all significant vendor selection decisions, and favor architectures and technologies that could be more easily replaced if a vendor ceased to be viable.
- **Standards compliance.** Ensuring compliance with technology standards was a common challenge, reported by around a third of the surveyed CTOs. There was no significant variation by region, company size or type of CTO organization (e.g., formal vs. informal). This suggests the issue may be caused by more general tensions between goals, such as standards compliance and innovation/agility, or a desire for business unit autonomy. CTOs should educate their organizations on where standards exist and expose the hidden costs of noncompliance, e.g., in terms of technology diversity or technical debt.

- **Business alignment.** Thirty-one percent of respondents reported problems with technologies not meeting business needs. There were no significant variations by region or company size, but organizations with no established CTO office were more likely to report problems. This is likely because these respondents have a less mature process for technology evaluation and adoption, which is weaker at ensuring business alignment. CTOs should adopt more standardized technology selection and assessment processes that document business needs and ensure they're addressed before technologies are purchased.

## What You Need to Do

The challenges CTOs face can be addressed in many ways. Some solutions are organizational and political, such as ensuring that the CTO organization is involved in key decisions and processes. Some demand stronger processes; for example, considering a wider range of issues in vendor selection. Some can be mitigated by technology; for example, by partial automation of tasks needing scarce resources. Successful CTOs have developed many ways to address these common challenges. Some of their most effective near- and long-term strategies are detailed below.

### Near-Term Actions

#### Conduct a Wide-Ranging Review of Talent Management

There are few magic bullets to address talent shortages, but a review can highlight opportunities for improvement. For example, build tighter relationships between the CTO and HR to change recruiting processes and review compensation, job descriptions and working practices.

#### Review Cybersecurity Investment and Organization

In organizations where cybersecurity is the CTO's responsibility, review the strategy and cybersecurity organization and, if necessary, make a case for increased investment to address the growing risks. Even when cybersecurity is not the CTO's direct responsibility, build a strong collaboration with the chief information security officer (CISO). Also, review and update those CTO goals that involve risk assessment — for example, in the areas of innovation and technology strategy. Consider using cybersecurity risks and the growing legal exposure they represent as a justification for making informal CTO organizations more structured.

## Loop in the CTO for Vendor Selection

Ensure that the CTO has visibility into high-impact vendor decisions. This could be done, for example, by defining financial, organizational or technical thresholds that trigger a review. Create structured vendor assessment checklists that address technical, commercial, reputational and strategic issues. Also, before adopting new products and technologies, ensure there is an outlined contingency plan showing how the new items could be abandoned if the vendor ceases to be viable. When possible, favor vendors that use industry standard technologies, which may be less disruptive to replace or augment.

## Explain Why Standards Are Important

Improve communication about standards compliance to explain why it's important, and to ensure that staff knows where recommended technology standards exist. Expose the costs of noncompliance in terms of technical debt and technology management burdens. Review processes to measure and police compliance and ensure that they aren't a bottleneck. For example, ensure that technology review processes are lightweight, and define SLAs that guarantee rapid reviews.

## Focus on Needs, Not Technologies

Try to shift the technology strategy to be more outcome-oriented than technology-oriented. Short-term tactics include:

- Establishing quantified goals before selecting technologies
- Deploying minimum viable products (MVPs) to expose challenges early
- Conducting evaluations focused on business proofs of value rather than technical proofs of concept

## Longer-Term Actions

## Grow More Skills Internally; Use Technology to Supercharge Skills

CTOs have a good view of likely future skills requirements, so they should develop and sponsor opportunities for internal training and career development to grow skills internally. Look for innovations where technology might be a partial substitute for scarce skills, such as AI-enabled data analytics tools that can search for patterns in datasets, rather than assigning those tasks to trained statisticians or data scientists. AI assistants in areas such as programming can improve productivity to make better use of available skills. Adopting advanced tools such as these may also make an organization a more favored employer. Consider working with HR to extend borderless workforce strategies and possibly relocating functions such as centers of excellence to regions with greater skills availability. Also, consider tactics to make assignments more varied and attractive in order to improve retention. For example, some CTOs rotate staff through different parts of their organizations to provide a more varied experience.

## Adopt Better Cybersecurity Strategies

Scaling up current siloed cybersecurity practices may be unsustainable in the long term. Consider new approaches to cybersecurity, such as Gartner's continuous threat exposure management. (For more information, see [Top Strategic Technology Trends for 2024: Continuous Threat Exposure Management](#).)

## Architect for Reduced Vendor Stability

Address the tensions between innovation and vendor safety by encouraging architectures that facilitate vendor and technology replacement. For example, consider creating service-based and modular architectures that allow easier replacement of services and components.

## Create Carrots and Sticks to Influence Compliance

Look for ways to make it easier for “customers” of technology strategy to comply with standards (e.g., embed standards in platform services so compliance is easier than the alternative). Negotiate centralized technology licenses or purchasing agreements so standards compliance is the least expensive option. In extreme cases, consider penalties for noncompliance, such as not providing central support and troubleshooting services for certain technologies. Finally, look for allies who care about the costs of noncompliance and may be in a position to influence the business executives — for example, the CFO.

## Better Align Needs With Technology Selections

Adopt processes, such as design thinking, that focus on needs and goals before selecting technologies. Test proposed selections using tactics such as scenario planning to validate that they're likely to be robust and long-lived.

## What You Need to Know

A key responsibility of a typical CTO is developing, communicating and maintaining technology strategy. Typically, this includes standards definition, technology selection, risk management, technology deployment and vendor management, and extends through to technology retirement. Depending on the CTO persona, this might cover only the IT organization, but often has a wider scope involving business technologies as well as IT. (See [How Chief Technology Officers Can Deliver Value by Using Our Four Personas.](#)) It's also common for CTOs to manage innovation or technology monitoring teams that look at longer-term technology opportunities.

The goals of technology strategy are growing more complex. Increasingly, CTOs are required to take a broad view of technology viability, which extends to considerations such as regulatory compliance, resilience, user experience, sustainability and even digital ethics. Furthermore, there may be tensions between goals, such as safer vendor selections and the CTO's mandate to innovate, which may demand smaller or less established vendors.

The 2023 Gartner Changing Role of the CTO Function Survey helps illustrate that challenges for the function are not technical; they are also political and relational, requiring the CTO to broaden their sphere of influence, build additional partnerships, and leverage stakeholder and ecosystem talent pools to execute strategy. Technology strategy also operates against a background of organizational politics, where it's common for tensions to exist between business units that want autonomy and agility, and the CTO, who wants organizationwide compliance and standards. It's therefore no surprise that our survey shows that a typical CTO experiences a wide range of challenges in developing and maintaining a technology strategy.

## Evidence

<sup>1</sup> **2023 Gartner Changing Role of the CTO Function Survey:** This study was conducted to understand the CTO function design and how CTOs and their organizations are changing their operating models and enabling digital business model innovation and transformation. The research was conducted online from 15 May through 6 July 2023 among 404 participants from North America (n = 204), Europe (n = 147) and Asia/Pacific (n = 53). Participants were leaders in their organization who were knowledgeable about the roles and responsibilities of the CTO. Respondents were screened for industry, job title, company size (at least \$500 million in annual revenue), knowledge on organizational structure and their reporting level away from the CTO. Industries surveyed include banking/investment services, manufacturing, healthcare providers, insurance, natural resources, government, services, energy, retail, utilities, health payer, communications service provider, transportation, education provider and wholesale. Disclaimer: Results of this survey do not represent global findings or the market as a whole, but reflect the sentiments of the respondents and companies surveyed.

<sup>2</sup> [Google Cloud Will Shutter Its IoT Core Service Next Year](#), TechCrunch.

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## Recommended by the Authors

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[Top Strategic Technology Trends for 2024: Continuous Threat Exposure Management](#)

[Understanding the CTO's Role in Technology Strategy](#)

[Quick Answer: What Are the Components of a CTO Operating Model?](#)

[Case Study: Alignment of CTO Team With Business Goals \(The University of Utah\)](#)

[How CTOs Can Build a Technology Talent Acquisition Strategy](#)

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