# THE CEO'S GUIDE TO
## Hiring a Technology Leader
## (CIOs, CTOs, and CISOs)

*The industry's first and only guide for CEOs*

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**FortiumPartners.com**

Reputation. Responsiveness. Results.

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# Introduction

> *"There is no success in business without technology, and there is no success in technology without technology leadership."*
> *— Burke Autrey, Fortium Partners*

An organization's success or failure depends on its ability to plan, implement, and manage technology effectively. Leadership in this space goes beyond managing technology. It fuels innovation, aligns with broader goals, and ensures organizations stay competitive in a rapidly changing world. At its core, this book builds upon a simple truth: success in technology requires strong, capable leadership.

Technology evolves faster than any other organizational function. Yet, the responsibility for finding, engaging, and managing technology leadership falls to individuals who often lack a background in technology themselves. Most CEOs and business leaders don't have an innate understanding of the complexities of technology leadership.  This book bridges that gap.

# The Chief Technology Officer (CTO)

## What is a CTO?

The CTO is the most senior technology executive reporting to a non-technology executive in a Technology Creator organization that is laser-focused and purpose-built, top to bottom, to create great technology products for their Technology Consumer customer (in B2C, the Consumer; in B2B, usually the CIO). Marc Andreessen's 2006 blog post, 'Why Software is Eating the World,' foresaw the transformative power of software—a prediction now realized in the explosive growth of innovative, highly profitable technology companies. At the heart of this evolution, the CTO has emerged as the pivotal leader driving product development in these organizations."

Further, creating and adopting cloud-based computing platforms have enabled Software-as-a-Service (SaaS) - the most common business model for delivering software. As Technology Consumers spend more on Cloud (Infrastructure-as-a-Service) and SaaS, the importance of the CTO as the primary leader responsible for product development and overseeing product operations has earned the CTO role a distinction as one of three primary technology leadership roles (CIO, CTO, CISO). While there are similarities between the CIO and CTO, defining them as separate roles in the context of Technology Consumer and Technology Creator organizations is a significant contribution to understanding the role of technology leadership in organizations.

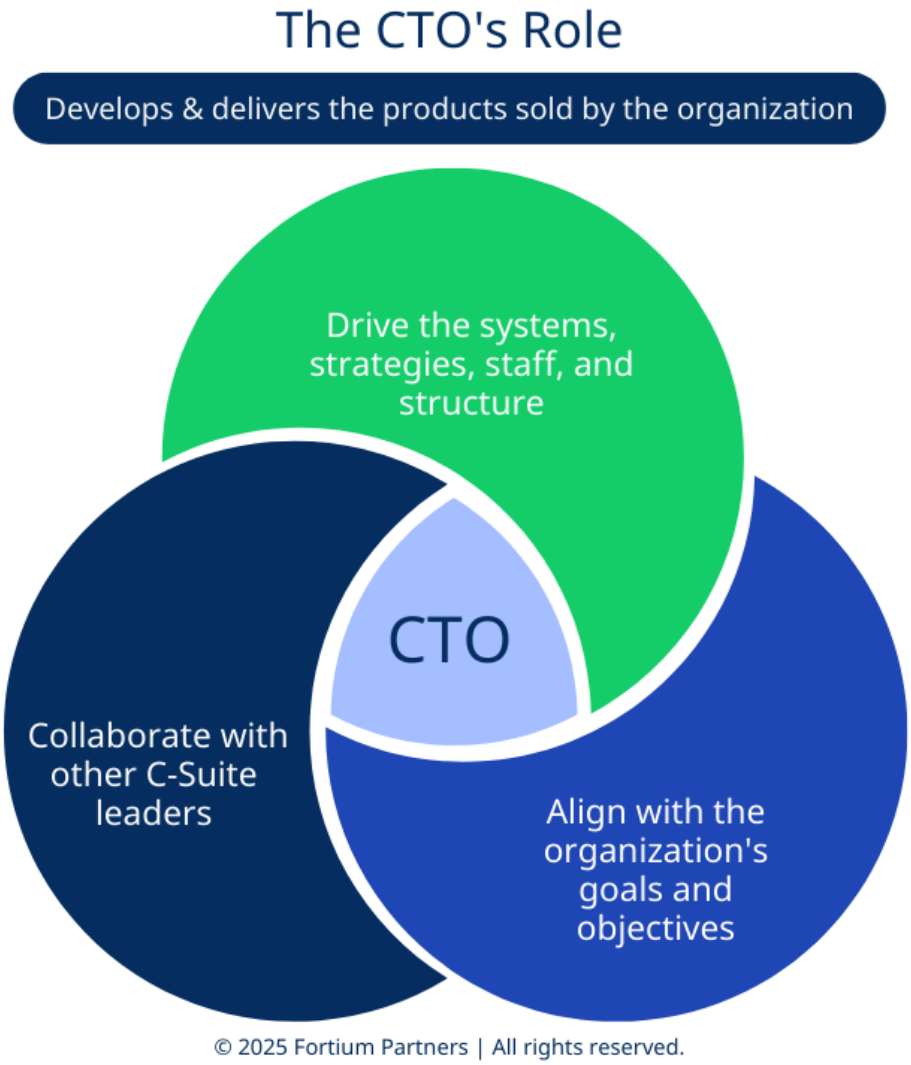
*What is Product Operations?*

*Product Operations, often referred to as "Product Ops," serves as the connective tissue between product development, customer success, and operational excellence. It encompasses the processes, tools, and frameworks that ensure a product is delivered, supported, and maintained effectively across its lifecycle. In a*

*Software-as-a-Service (SaaS) environment, Product Ops focuses on enabling seamless deployment, monitoring, and scaling of the product in production environments. This includes managing infrastructure, ensuring performance and reliability, integrating user feedback into development cycles, and optimizing resource allocation to meet both technical and business goals. By bridging the gap between strategic objectives and day-to-day execution, Product Ops ensures the product continuously delivers value while remaining aligned with organizational priorities.*

## What is a CTO's Role within the C-Suite?

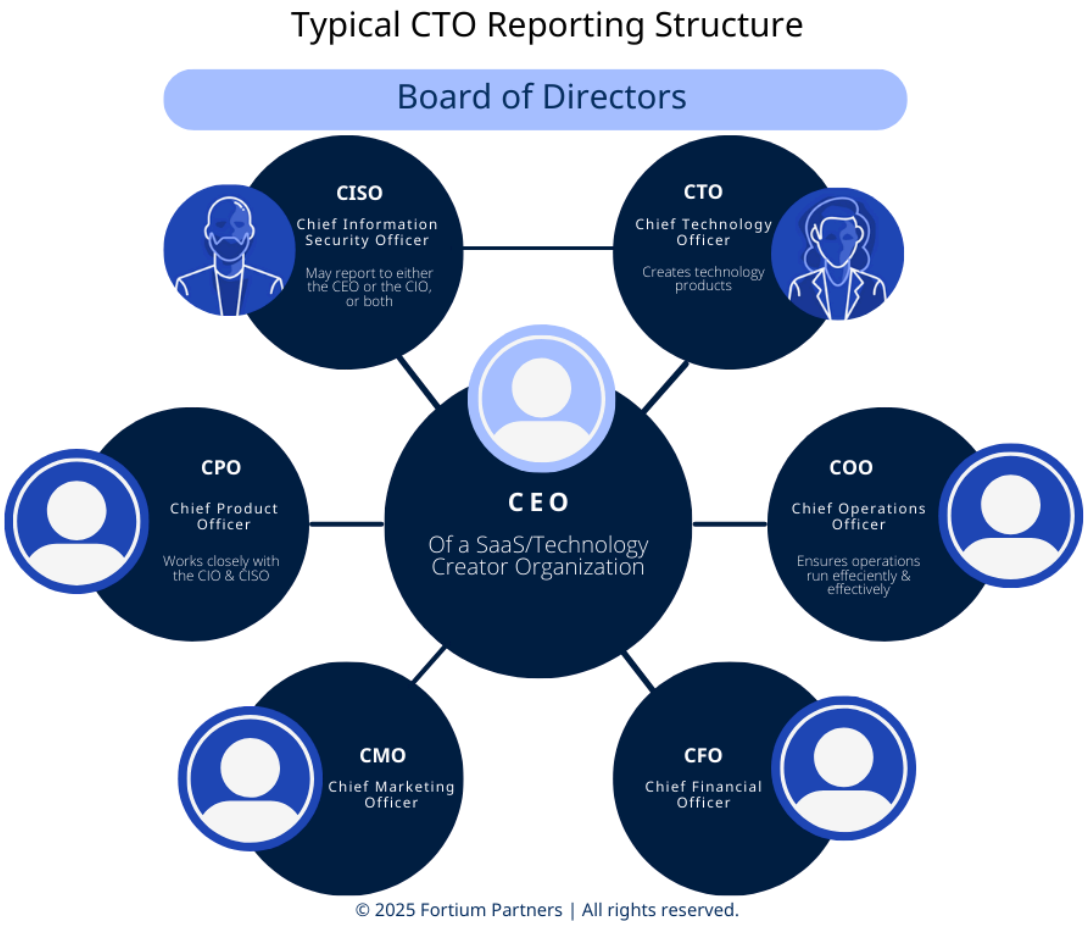
The C-suite operates one level below an organization's Board of Directors. As the most influential and important group of leaders within an organization, its primary role is to ensure that the firm stays true to its established mission, vision, values, goals, plans, and policies needed to be profitable by satisfying its core customers' most pressing needs. Since the primary role of the CTO is to drive the systems, strategies, staff, and structure needed to deliver the products and services sold by the organization, a CTO has an integral role in collaborating with other leaders to achieve the goals and objectives of the organization.




## Who does a CTO report to?

In a Technology Creator organization (e.g., a SaaS company), the CTO is the primary technology leader responsible for building the organization's main revenue driver and typically reports directly to the CEO as a peer to other members of the C-Suite. Beyond this critical role in constructing and deploying the revenue engine, the CEO often relies on the CTO, alongside the Chief Product Officer, to develop a business case, rationalize the product roadmap, and plan for future revenue and spending. Additionally, the CTO

and their team play a key role in defending against revenue threats, such as security breaches or production issues. When the CTO does not report to the CEO, it often signals a lack of seniority or an unconventional organizational structure (e.g., where the CEO has delegated operational authority to a President or COO).




## What Kind of Companies Need a CTO?

Most companies achieve innovation through software, and commercial software companies provide the vast majority of software.  Technology Creators, such as SaaS companies, *need* a CTO from the beginning.  The complexities of building a commercial software product are too significant and too broad to risk not having the input and oversight of a competent and experienced CTO.  The good news is that most modern

software companies of size, say over $5-10M in revenue, have a CTO overseeing the development of the product.

If a SaaS company does *not* have a CTO, it is usually due to one of three reasons:

1) **The Founder or Co-Founder *is* the CTO**. Otherwise known as a Technical Founder or Co-Founder, they may have other titles such as CEO, Co-CEO, Chief Product Officer, or COO. When this is the case, these other general management titles obscure the fact that the company has an embedded CTO. Often, these CTOs-in-disguise are much better CTOs than whatever other role their titles might suggest. If the company continues to grow, takes on new investors, and/or brings in an experienced CEO, the CTO will usually take on their appropriate title as CTO to allow the company's leadership to evolve. Interestingly, the Technical Founder is often most passionate about the initial product vision and finds the early stages of building and taking a product to market the most rewarding. It is common for the company's early founder/CTO to lose interest or be found inadequate in increasing management and strategy responsibility for the CTO role as it grows.
2) **The Founder is not technical**; **there is no Technical Co-Founder** or an individual or small team without CTO oversight built the early product. While this approach may be sufficient to get a product to market or achieve product-market fit, the non-technical Founder often manages the increasing complexities of a commercial software product without the necessary skills and experience. Common medium- to long-term implications include:
    a) Rising development costs without associated increases in features or mounting quality problems,
    b) Software developers have built the product "into a corner" where poor technical decisions make progress increasingly complex and more expensive, resulting in claims that the product needs to be rebuilt "from scratch,"

c) The early developer or developers become intransigent, disagreeing with the decisions made by the Founder, Board, or investors, and put the company at risk by refusing to comply or even engaging in subversive activities.

3) **The Founder or CEO is unaware or doesn't agree that the company needs a technology leader on the senior leadership team**. The technology leader may be capable and experienced. Still, they are not in a senior leadership role - often reporting to the CFO, Sales, or some other non-technical role that reports to the CEO. This approach may work in the early years, most commonly in founder-led or bootstrapped software companies. Still, as the company grows, it will result in dysfunctional behaviors, such as:
    a) The technology leader (e.g., Director of Software Development, VP of Software Engineering, etc.) is effectively limited to tactical execution without input into product strategy or the ability to influence key decisions in Product Management, Finance, Sales, or Marketing. The result is technical debt, new features without a proper foundation, and the lack of sales blamed on the product instead of Sales.
    b) A "Software culture" never really develops. The organization cannot recruit the best developers, doesn't pay them well, and cannot keep the product current enough to attract them.
    c) Technical innovation stalls as, ironically, the only "CTO" that would remain in a CTO role that doesn't report to the CEO may not be a CTO at all.

These three scenarios illustrate the importance of clearly and authoritatively defining the CTO role, its place in Technology Creators, and its relationship with Technology Consumers. Buyers of commercial software are increasingly outsourcing innovation and regulatory compliance to Technology Creators, and they expect them to have strong leadership at all levels, especially in product development. Such a company without a CTO, as we've defined here, puts its customers at risk and should be a warning sign for existing and future customers.

## What are the Key Responsibilities of a CTO?

We learned above that the CTO is the most senior technology executive reporting to a non-technology executive in a Technology Creator organization. Yet what does the CTO do?

- **Strategy Participation:** The CTO assumes a C-Suite role with shared responsibility for company strategy, product strategy, and market decisions and participates in executive team and board meetings. The CTO is involved with any merger and acquisition discussions.
- **Implementation Oversight**: While Product Management is responsible for defining product features and, often, what they will look like (e.g., the “What”), the CTO is responsible for how those features are implemented (e.g., the “How”), including the architecture and technologies involved to build them.
- **Talent Management**: The CTO is responsible for all the talent resources that report up to the role, including those responsible for software development, quality assurance, software build and deployment, security, process/Agile, and production infrastructure support.
- **Process Management:** The CTO collaborates with Product Management throughout the development process, playing a crucial role in estimating feature requests, prioritizing tasks for each iteration, and ensuring the successful delivery of committed features. Process metrics measure progress, evaluating the output compared to the initial commitments, the team's velocity in accomplishing work within a specific timeframe, and the quality of the deliverables. Moreover, the CTO is responsible for safeguarding the team's commitments, effectively managing shifting priorities, scope changes, unforeseen tasks, complexity underestimations, ambiguously defined requirements, and stakeholder disruptions.
- **Product Sustainability**: In addition to meeting the functional requirements defined by the Product Management team, the CTO and their team are responsible for ensuring the product's long-term sustainability through strategic refactoring, minimizing technical debt, and prioritizing critical non-functional aspects such as scalability, performance, security, reliability, and interoperability.

The ultimate responsibility of the CTO's team is to ensure the comprehensive well-being of the product throughout its entire lifespan.

- **Infrastructure Management**: As the production environment, i.e., the cloud infrastructure the product runs on, becomes an essential set of non-functional features, the CTO and their team are responsible for ensuring optimal performance, scalability, and security. Timely incident management and post-incident reviews are crucial tasks to facilitate the consistent availability and reliability of the product.
- **Intellectual Property Guardianship**: As guardians of vital intellectual property, the CTO and their team oversee many responsibilities relating to a company's source code, including version control, code review, secure coding practices, access control, and compliance with company and regulatory controls. The CTO is critical in ensuring the protection and integrity of a software company's most valuable assets.
- **Business Leadership:** The CTO's responsibilities extend beyond technical expertise and encompass broad business leadership. They collaborate with peers across functions—Product Management, Marketing, Sales, and Customer Support—to assess feasibility, engage with potential clients, highlight technology's role in key selling points, and troubleshoot customer issues. The CTO also plays a critical role in budgeting and optimizing technology investments, identifying opportunities to expand into new markets, and, when appropriate, evaluating potential acquisitions to support strategic growth.


## *Responsibilities a CTO Should NOT Have*

*While the CTO holds a crucial and diverse role, it is equally important to outline specific responsibilities that should fall **outside** their purview. The list provided below is not exhaustive but serves as an illustration of the range of duties that a Chief Technology Officer (CTO) may be assigned, but could be problematic:*

- ***Product Management** - While it's not unusual for a CTO to take on Product Management responsibilities (sometimes titled Chief Product and Technology Officer or CPTO), especially in smaller startups, as a company grows, it usually makes sense to separate these roles to ensure that each gets the attention and expertise it deserves. Each role*

*has its own responsibilities, and trying to fulfill both can lead to a lack of focus and potentially suboptimal outcomes for each. The CTO/Product Manager may overfocus on non-functional features and reduce technical debt, while Product Management might advocate for prioritizing new features or improving the user experience. This tension can lead to better decisions that balance technology and product needs.*

- ***Customer Demos*** *- While there are some good reasons a CTO may be involved in customer demos, especially in the early stages of the company, it is a best practice for SaaS companies to invest in Sales or Solution Engineering as part of the Sales team to manage customer demos. Doing customer demos well requires an investment in demo environments, demo data, demo scripts, and tracking the demo as part of the Sales process. Borrowing the CTO for every demo is not a good use of their time and prevents Sales from fully developing a critical part of their function.*
- ***User Interface and User Experience Design****: Product Management and the CTO's team are equally responsible for the customer's experience with the product. However, Product Management is better suited to conceptualizing the user experience and implementing the intended features. Meanwhile, Product Development, led by the CTO, is responsible for bringing to life the design provided by Product Management. This separation of responsibilities allows each group to contribute their best skills.*
- ***Contributions to Production Source Code****: A CTO needs to stay connected with the technical aspects of the company's work, including exploring new tools, languages, and coding techniques - and conducting proofs of concept that can inform and inspire the development team. However, the CTO must have the time and focus to handle their strategic and managerial responsibilities. A CTO with production coding responsibilities may also indicate the presence of a CTO without the*

*seniority the company truly needs or an over-dependence on full-time employment (e.g., hiring a developer and giving them "CTO" responsibilities because the organization can't afford two people nor attract senior leadership in two full-time roles).*

- ***Traditional CIO Responsibilities**: Software companies have many of the same internal technology needs as non-software companies, including end-user computing provisioning and support, non-production infrastructure such as a company's internal servers and network, and non-production applications such as accounting and HR solutions. It's common in smaller software companies to assume all technology-related responsibilities should fall under the CTO. However, this is often not the best and highest use of the CTO's skills and attention. In the early stages, the combination of a virtual or fractional CIO plus a Managed Services Provider (MSP) can fill this role. A full-time Chief Information Officer (CIO) and internal technology resources may be beneficial as the software company expands.*
- ***Traditional CISO Responsibilities**: Similar to the software company's CIO responsibilities, it's common for the CTO to assume the duties of the Chief Information Security Officer (CISO). Again, the CTO often has enough knowledge and experience to take on these responsibilities, but this is not ideal. The CISO role has an entirely different set of complexities that change quickly and require constant focus to mitigate risk to Technology Creators and Consumers. The CTO has a complete set of responsibilities that do not lend themselves well to being a security expert on top of everything else. If the company is small, combining a virtual or fractional CISO with a Management Security Services Provider (MSSP) can fill this role. As the company grows, more resources may be available for a full-time CISO and team.*
- ***Customer Support** - In most SaaS companies, the Customer Support function typically does not directly report to the CTO. Instead, it often*

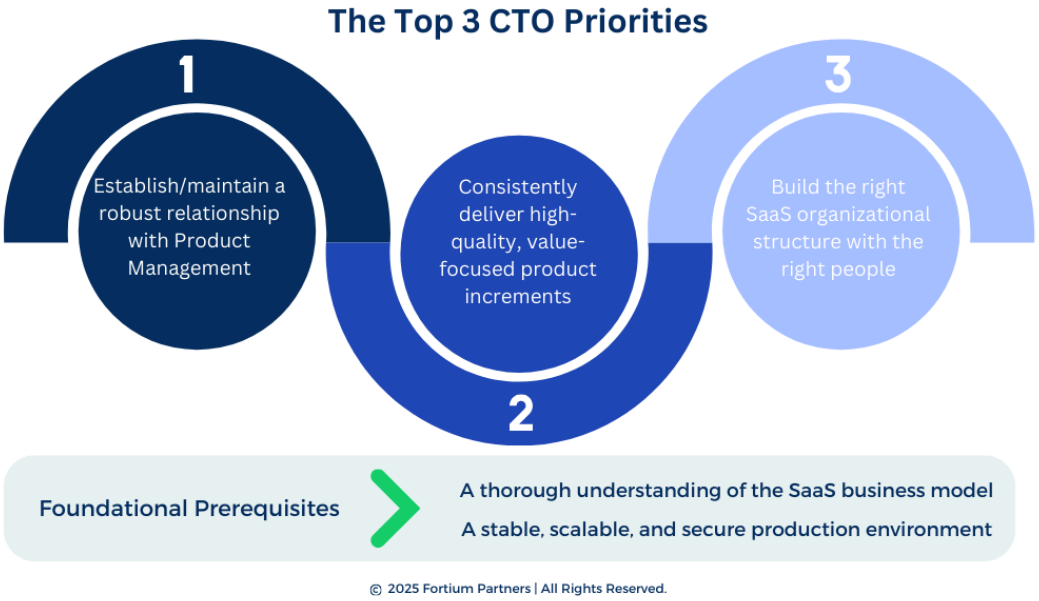
*falls under the purview of a Head of Customer Support, a Customer Success Manager, or a similar role. These positions, in turn, may report to the COO, head of Professional Services, CCO, or sometimes directly to the CEO. The CTO and their team, focused on product building and improvement, may unintentionally underestimate the significance of providing exceptional customer service for every customer interaction, even for more straightforward issues. Customer service professionals with a genuine passion for delivering outstanding customer experiences are ideally suited for direct engagement with the CTO's team and Product Management. They can help research, prioritize, and consolidate customer questions and issues, ensuring an efficient workflow for the Product Development team.*

- ***Target Industry Expert*** *- While it may be tempting to expect the CTO to be an expert in the industry served by a SaaS product, such as healthcare for medical practice management software or manufacturing for an ERP specific to manufacturing companies, the core responsibilities and attributes of a successful CTO pertain to the software industry itself, rather than any one particular target industry. The CTO role, applied across multiple industries in their career, is highly specialized and requires significant dedication to achieve and maintain. While experience in the target industry is advantageous, a CTO who is too specialized in this regard may have limited their career potential. For example, a CTO with extensive target industry experience might be less versatile than a more well-rounded CTO who has kept pace with the latest developments across multiple industries.*

## What are the Top 3 Priorities of a CTO?

Many articles about executive priorities aim to highlight the latest trends and technologies and convince executives that priorities change frequently (curiously, every January). Readers must rush to various publications (and their advertisers) to find out what they should focus on now. As in the prior section, the CTO's top 3 priorities remain consistent through changes in technology and business climate across time. Because a main driver toward having a CTO is a single-industry (Commercial Software/SaaS) role, there are two foundational pre-requisites a CTO must accomplish before turning to other priorities:

- **A thorough understanding of the SaaS business model:** Unlike the CIO and CISO, the CTO focuses exclusively on the commercial software industry, and most commercial software companies are SaaS companies. Therefore, beyond mastering the technical aspects of the CTO role, an expert understanding of the SaaS business model is critical to leading well as a CTO.
- **A stable, scalable, and secure production environment:** A perfect SaaS product is ultimately useless if not hosted in a stable, scalable, secure production environment. The best CTOs will treat the production environment as an integral set of product features and treat any lack of production stability, scalability, or security as the highest priority requirement over any functional product features.




Having established these foundational pre-requisites, the **top 3 priorities** for the CTO are:

- **Establish and maintain a healthy and robust relationship with Product Management:** Mutual respect, effective communication, trust, and collaboration define the relationship between the Chief Product Officer (CPO) and their team and the CTO and their team. Product Management's responsibility is to determine the right product. Though perfectly produced by the CTO's team, the wrong product will fail. The right product, imperfectly built, will fail. The success of the CPO and CTO are intertwined.
- **Consistently deliver high-quality, value-focused product increments on a streamlined development and delivery platform:** The less friction a feature encounters from definition by Product Management to development and release to the customer by Product Development, the higher the chance of success for the SaaS product and company. This is the essential job, the manufacturing process or supply chain, of a SaaS company. The CTO will remove and automate unnecessary steps iteratively. The CTO's ultimate goal concerning deployment is that the most simple of changes should move

securely from source code management to production (with the ability to roll back the feature easily) within minutes, any time of day, every day, without exception.

- **Build the proper SaaS organizational structure and populate it with the right people:** In small SaaS companies, people will wear many hats and take on multiple roles and responsibilities, but somebody must still do the essential jobs. As the SaaS company grows, individuals become more specialized, and various people will focus on more detailed aspects of the same responsibilities. The CTO ensures that all Product Development responsibilities are covered by the organizational structure, regardless of size, and that the best people the organization can afford and attract fill the seats. However, the Product Development organization can't succeed if the rest of the organizational structure isn't properly defined and staffed. The experienced CTO will contribute at the executive level to organize and staff the remaining business functions, including:
    - Product Management (including User Interface Design and Experience)
    - Sales (including Sales Engineering)
    - Marketing (including Product Marketing)
    - Customer Success and Support (and, if the company provides implementation and customization services, Professional Services)
    - Operations and Human Resources
    - Finance and Accounting (including subscription billing)
    - Security and Internal Technology (Production tools and infrastructure is the CTO's responsibility; a full- or part-time CIO should lead internal technology, and a full- or part-time CISO should lead security and compliance)
    - Legal and Compliance

## What Organizational Situations Drive the Need for a CTO?

We've established two CTO prerequisites from above:

1. The CTO is a single-industry (Commercial Software/SaaS) technology leadership role and
2. The CTO is a Technology Creator organization's primary product delivery executive, leading all aspects of building and offering SaaS products.

So, *every commercial software or SaaS company needs a CTO in a full-time, part-time, or advisory role*. Additionally, there are a few situations where a SaaS company should consider a change in the CTO role:

- **Rapid company growth:** The needs of a small, early-stage SaaS company vary significantly from those of a large or rapidly growing SaaS company. In the early years, fewer people do many jobs that often require individuals with a broad skillset but perhaps not as deeply skilled at each discipline. The early-stage CTO is particularly adept at leading the small SaaS company to develop good habits, avoid poor decisions, and take a hands-on approach to managing the output of a small team. Rapid growth and the demands of a large SaaS company require very deep technical skills across many disciplines in the organization, with a CTO who has experience leading large teams or during rapid growth. Often, the CTO that got the company to the growth stage is not the right CTO to take the company to the next level.
- **Re-architecting or re-platforming an existing software product:** It's not unusual for a software product to reach a point where significant changes in the underlying platform or architecture are needed - possibly due to very high technical debt, poor architecture, and development decisions or simply a change in the prevailing technologies in the market. Often, in these situations, the individual who contributed to the current state, whether in the

CTO role or not, has insufficient experience in understanding the many technical, organizational, and change management tasks required to keep the current product operating in production while building and deploying the new product in parallel. A CTO with experience in larger SaaS companies who has led teams through similar transitions may be needed to take the primary CTO role, oversee the development of the newly architected product, or advise the incumbent CTO through the transition.

- **Changing product delivery models from on-premise to SaaS:** On-premise delivery models differ from SaaS delivery models so significantly that, in many respects, they should be considered two different companies. The approach to changing product delivery models from on-premise to SaaS alone easily justifies an entire book. While an experienced SaaS CTO should be capable of transitioning from an on-premise to a SaaS delivery model, it would be a significant risk for a company to trust a CTO without SaaS experience to lead such a transition.
- **Inconsistent delivery of value from Product Development to the business:** While it's rarely acceptable to allow a business function to deliver value inconsistently, it is especially unacceptable if it supplies the organization's primary revenue-generating product. Such is the case with the Product Development function in a SaaS company. Recall that it is the job of Product Management to define the product to be delivered, and it is the job of Product Development to deliver it. If the CTO cannot deliver consistently, the perspective of a new CTO is required as a replacement or, at a minimum, in an advisory capacity to help the incumbent CTO and the company understand the underlying causes for the inability to deliver.
- **The CTO role is combined with another role:** The importance of the CTO role and the technical abilities of a CTO in a software company often lead the CTO to take on more responsibilities to exert greater control over their ability to succeed in delivering the product. The most common examples include the CTO taking on Product Management, Sales Engineering (customer qualification and demos), Security, and Customer Support. While it may

make sense for the CTO to cover these roles in early-stage companies or temporarily while the role is vacant, it is a red flag if the CTO continues to serve in these roles long-term as the company grows.

- **The CEO is performing the CTO role:** It is typical for the technical founder and CEO of early-stage SaaS companies to assume the CTO role. However, as the company grows, this individual will either delegate the CTO role and remain the CEO or vacate the CEO role. Aside from the obvious challenge of having the capacity to do both roles, several dysfunctional behaviors will persist if the CEO remains in the CTO seat:
    - The CEO/CTO exerts undue influence over Product Management (or keeps Product Management entirely), often prioritizing technical features at the expense of input gained from Sales, customers, or competitors
    - The CEO/CTO spends too much time on Product at the expense of supporting the rest of the organization and spending time in front of customers
    - The CEO/CTO may tolerate poor performance in Product Development while holding all other functions to a higher standard.
- **The CTO does not report to the CEO:** If the CTO and their team report anywhere other than the CEO, the SaaS company is setting itself up for failure. The most common outcome is the SaaS company's inability to hire and retain a world-class CTO; the best CTOs will see this as a significant red flag. The CTO that the company *can* hire in this situation will almost certainly be less effective due to a host of direct and indirect consequences:
    - Difficulty attracting top SaaS technology talent
    - Difficulty building or maintaining a competitive product
    - Production issues due to insufficient investment in retiring technical debt and a stable production infrastructure
    - Low customer satisfaction and churn due to slow/late release of features and inadequate response to product issues

- Internal frustration between Product Development and other functions due to poor delivery performance by Product Development
- Poor financial performance as a result of all of these combined


## What are some Alternative Titles for the CTO?

The preceding sections provide a comprehensive overview of the core aspects of the CTO position. However, some use alternative titles to designate this role, such as:

- Chief Information Officer (CIO) - this is the most common alternative title for the Chief Technology Officer. This book describes the difference between these two roles and the types of organizations they serve. The CIO primarily serves organizations that are Technology Consumers (with less than 50% of their revenues derived from the sale of information technology). In comparison, the CTO serves primarily Technology Creators (with more than 50% of their revenues

derived from the sale of information technology). We advocate for consistently defining these roles differently to clarify recruiting and hiring decisions.

- Vice President (VP) of Software Engineering - The VP of software engineering title is closely related to the CTO and usually reports to the CTO. Many smaller software companies may only have a VP of software engineering, especially when the company has a technical cofounder filling the CTO role. While the CTO focuses on the broader technology strategy, innovation, and cross-department collaboration, the VP of Software Engineering focuses more on the day-to-day management of the software engineering function, including team leadership, execution, and technical expertise. There may be multiple VP of software engineering roles in larger software companies.
- Lead Developer - a Lead Developer is a hands-on development role, often with additional team leadership responsibilities. CEOs of very small software companies frequently look to combine the CTO and lead developer roles for cost savings. As mentioned above, a CTO may continue to develop software for continuing education or proof of concept but does not typically have a hands-on development role. Consider a virtual or fractional CTO to augment a lead developer role rather than combine them.
- Technical Co-Founder - Adding "Technical" to the Co-Founder title usually indicates that one of the co-founders is taking on the role of CTO within an organization. In these cases, combining both roles as Technical Co-Founder and CTO would be typical. The *other* co-founder(s) assume non-technical roles like CEO, Chief Product Officer, etc.
- Chief Product Officer (CPO) or Product Manager—Senior product management roles such as CPO or Product Manager may subsume the CTO role, especially if the CPO is a founder or is particularly technical. Combining the titles is done for efficiency. As mentioned above, separating these roles is recommended to allow each to focus on their unique abilities and champion different aspects of the product.
- Chief Scientist - While both roles require a deep understanding of technology and science, they focus on different areas. The Chief Scientist is more concerned

with scientific research and understanding the latest developments in the field. The CTO focuses on using technology to drive the company's business goals. Software companies in highly technical domains such as artificial intelligence, machine learning, and quantum computing are likelier to have a Chief Scientist. It is common for the Chief Scientist to report to the CTO.

Similarly, some use the CTO title for other roles:

- Chief Information Officer (CIO) - Using the CIO title as the most senior executive responsible for technology in an organization, primarily a Technology Consumer, is appropriate. Using the CTO role in these types of organizations leads to confusion about the nature of the role and the person who holds it.
- Vice President (or similar) of Infrastructure - indicating the most senior individual in an organization responsible for computing infrastructure (desktop computers, servers, network, data center, etc.). The VP of Infrastructure role is highly technical, mainly focused on hardware (or software specifically within Infrastructure-as-a-Service or IaaS), and often reports to the CIO in a Technology Consumer organization or the CTO in a Technology Creator organization.
- Vice President (or similar) of Software Development (in a Technology Consumer) - Software development as a function is not limited to Technology Creators. The VP of Software Development in a Technology Consumer organization leads the software development function to build software for internal use only (e.g., not for sale) and usually reports to a CIO. While the individual responsible for software development in a Technology Creator may use the VP of Software Development title, it is more typical to use the VP of Software Engineering title.
- Senior Sales or Solution Engineer in a Professional Services or Custom Software Development Organization - some professional services firms or custom software development organizations prefer the title of CTO for individuals who primarily represent the sales/business development function, engaging with prospects and clients (typically in Technology Consumer organizations) to propose technology solutions. While these individuals possess technical expertise and may have previously held the CTO title, using the CTO designation in this manner can

create confusion during recruitment and hiring processes. In reality, the typical buyer of these services is often the CIO (or their team) in a Technology Consumer organization. To minimize confusion and promote clarity, we suggest using titles such as Sales Consultant or Solution Engineer when referring to these positions.

## How Does a CTO Add Value?

As the CTO is the primary product delivery executive in a Technology Creator organization who leads all aspects of building and offering a SaaS product, hiring a CTO is essential to the product's and the organization's success. The following sections cover a broad, but not exhaustive, variety of challenges that a CTO solves as part of their role.

- **Provides Leadership for the engineering organization:** The CTO leads and is accountable for all personnel and activities involving product development, quality assurance, build and deployment, and often a portion of product support (typically, level 2 and beyond).
- **Gets the relationship with Product Management right:**
    - As mentioned, Product Management defines the product's features (the “What”). At the same time, the CTO’s team is responsible for implementing the features and building subsequent iterations of the product. Product Management, often under the leadership of the Chief Product Officer and the CTO, works closely to ensure that the product built will win in the market. The synergy and dependence of these two roles are vital to the SaaS company, and it’s tough for the CTO to succeed without a great relationship with product management.
    - Product Management juggles competing priorities and a roadmap of features that consistently exceeds the available resources. A history of precisely prioritizing well and executing gives Product Management confidence that what is prioritized will be completed.

- **Bridges business needs and technical solutions:** The bridge is the expected translation between non-technical people and engineers, between what and how a product is built, and the business's near- and long-term strategy. The CTO must deeply understand the business plan, its nuances, and how things work under the hood to ensure all the parts are aligned. A business-savvy CTO ensures the product is well-architected, will scale, and meets compliance requirements.
- **Ensures company resources are appropriately deployed and optimized.** Software development (and related production expenses) are the most expensive functions in a SaaS company. The CTO maximizes product development spending by aligning agile processes, putting the right people in the right places, and using the right tools.
- **Gets the toolchain right**: The toolchain in SaaS organizations refers to the set of software tools and technologies used throughout developing, deploying, maintaining, and scaling SaaS applications. These tools help in various stages like coding, testing, integration, deployment, monitoring, and management. With their team's help, the CTO chooses the right tools and technologies to impact cost, scalability, and security positively. Each tool in the SaaS toolchain is critical in ensuring efficient development cycles, high-quality software, smooth deployment, and effective management of the SaaS product.
- **Gets the process right**: Closely linked to getting the toolchain right, getting the development process right is essential to delivering consistent, high-quality product increments. The CTO will insist on an Agile process that includes strong collaboration with Product Management to define and communicate features but also goes beyond development to include source code management, code review, testing, deployment, and ongoing management of the production environment. A process that cannot accommodate the development, testing, and release of a new feature or fix to a known issue *at any time* is considered a Severity 1 issue and the highest priority.

- **Gets the product architecture right**: While technical product managers from Product Management may define technical features that impact product architecture, the CTO and their team are responsible for ensuring that the architecture supports the business's needs to scale efficiently, perform in production, meet compliance requirements, and allow for rapid deployment of new features.
- **Gets product security right**: Even the best SaaS companies will fail if security is not part of the process and the product. World-class CTOs ensure that Development, Security, and Operations (DevSecOps) have integrated security checks and practices at every software development and deployment step. Aside from the obvious benefit of keeping revenue flowing and customers protected, embedding security into the DNA of software development and deployment processes ensures that security considerations are an integral part of the development lifecycle from the outset rather than being an isolated phase. The result is more secure products, faster deployment cycles, and better alignment between security and business objectives.
- **Builds the right team**: The most talented people in software want to work with the best SaaS companies. A gifted and inspirational CTO is a SaaS company's best recruiting tool for the best product development people. Further, product development teams who respect and trust the CTO attract other high-performing engineering team members to the company. On the contrary, a SaaS company without a strong CTO will struggle to attract and retain the talent they need to succeed.
- **Defines what "Done" means**: While it may sound simple, the Definition of Done (DoD) for product teams, a clear and agreed-upon list of criteria that a product, feature, or task must meet to be considered complete, is often poorly defined and leads to inconsistent work quality and not meeting customer expectations. Key elements of the Definition of Done include standards for code completion, code review and quality processes, expectations for unit, integration, performance, security, user acceptance testing, documentation,

compliance, and many more. The CTO knows the tremendous risks that a lack of DoD brings to the SaaS company and ensures that estimates include the full scope of “Done.”

- **Sets appropriate expectations with key stakeholders**:
    - Product Development - high expectations for product quality, meeting estimates, and consistently achieving the Definition of Done are prerequisites for a CTO’s success. Compromising in these areas will create a chain reaction of failure to meet internal and external expectations and drag the entire company down.
    - CEO and Board - A world-class CTO knows what their organization can accomplish. Allowing expectations to exceed capabilities will result in frustration and conflict. Business-savvy CTOs will balance pushing their teams to greatness while setting appropriate expectations with the CEO and Board.
    - Product Management - Product Management often casts a vision that exceeds the capacity to deliver, and this approach is, in some respects, rewarded. Earning trust from Product Management by consistently delivering on commitments allows the CTO to set appropriate expectations to ensure the vision communicated to the market is achievable.
    - Sales - One of the most damaging traps for SaaS companies is allowing sales cycles to define the roadmap. While Sales input is valuable for understanding customer needs and market demands, there are pitfalls such as a short-term focus over a longer-term vision, neglecting technical debt, ignoring broader market trends, over-serving a particular customer segment, and overpromising to meet the sales cycle timeline. An accomplished CTO has the experience and relational skills to position Product Management as the owner of the product roadmap and support them as they gather input from Sales.
- **Addresses technical debt**: Technical debt results from repeated short-term development decisions (e.g., shortcuts) over more elegant and sustainable

solutions that require less rework over time. Like financial debt, if technical debt isn't "paid down" by modernizing every aspect of the product and infrastructure over time, the burden will cause innovation to slow to a crawl as each new feature or fix takes more time. Most experienced CTOs have lived this reality and are committed to dedicating a portion of development time to address technical debt ("refactoring") and are less likely to allow short-term decisions in the first place.

- **Gets infrastructure right**: With the advent of cloud computing and modern DevOps practices in the late 2000s, computing infrastructure (what SaaS software "runs on") has experienced a complete revolution, with SaaS companies managing infrastructure in the same way as software code is managed ("Infrastructure as code"). Modern CTOs are astute concerning SaaS cost and performance metrics and ensure their teams "build" virtual infrastructure with every release that reproduces itself at higher demand and reduces itself with lower demand - aligning costs with revenue and conserving where possible.
- **Responds to urgent events amid commitments**: Normal product planning maximizes the available capacity of the team and leaves no room for unexpected events. A SaaS organization dealing with a high amount of technical debt or immature processes will have more unplanned interruptions, causing it to miss commitments or overestimate individual features and fixes to account for the interruptions. The CTO will advocate that issues causing frequent interruptions be part of the planned work to bring accurate estimating back in line. Further, the CTO will ensure that the process and tools facilitate quick release and minimal downtime to reduce the impact on prior commitments.


# The Chief Information Security Officer (CISO)

## What is a CISO?

The Chief Information Security Officer (CISO) is a senior technology executive focused exclusively on shaping an organization's governance, risk management, compliance posture, and strategy, including digital or cybersecurity. The CISO's team protects an organization's digital assets from cyber threats and responds to cybersecurity incidents. The role extends beyond mere protection and encompasses comprehensive cybersecurity incident management across the technology environment.

While this serves as a baseline definition for a CISO, the role is currently at a crossroads, shaped by several converging forces. The rapid acceleration of cybersecurity breaches has heightened the urgency for organizations to protect their

digital assets, as the potential costs of an incident now include financial losses, reputational damage, and legal consequences. At the same time, stricter cybersecurity regulations are mandating greater transparency and imposing rigorous disclosure requirements, forcing organizations to rethink their security frameworks and governance strategies. This evolving landscape requires CISOs to address immediate threats and anticipate regulatory changes, align security initiatives with business objectives, and foster a culture of accountability throughout the organization.

## What is a CISO's Role within the C-Suite?

The CISO ensures that the C-suite clearly understands the organization's cybersecurity posture. The CISO coordinates the C-level discussion regarding the strategic priorities of the Cybersecurity program. The CISO does this by providing visibility into the components of the Cybersecurity program. Visibility typically includes the GRC (Governance, Risk, and Compliance) view focused on cyber risk and operational technology, encompassing the technical controls and programs mitigating cyber risk. However, some organizations may prefer to manage the operational technology aspects through a CIO who would work in concert with the CISO to implement the CISO's strategy that protects an organization's cybersecurity posture.

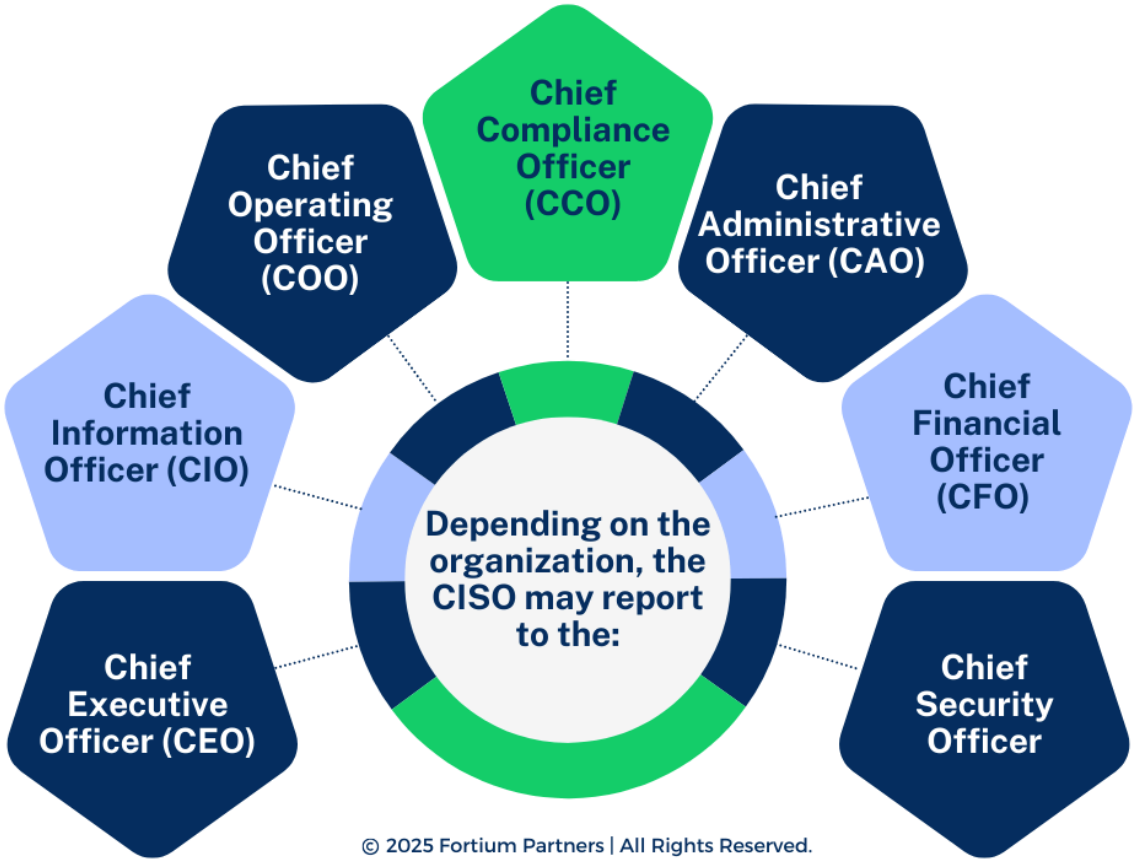
Additionally, the CISO establishes the framework for cyber incident response plans and assigns responsibilities across the organization. This process requires collaboration with multiple C-level executives, ensuring a cohesive approach to managing inherent and residual cyber risks. The CISO plays a critical role in aligning the C-suite on shared accountability and actionable strategies for effective cybersecurity program management.

## Who Does a CISO Report to?

There are diverse reporting structures for the CISO role that reflect the organizational needs and emphasize the significance of cybersecurity leadership, which is often directly or indirectly accountable to the board, CEO, or business owner. The majority of

CISOs report to the CIO or CTO role.  However, depending on the type of organization and the criticality of the role, the CISO may report to any of the following instead of or in addition to the CIO or CTO:

- Chief Executive Officer (CEO)
- Chief Operating Officer (COO)
- Chief Compliance Officer (CCO)
- Chief Administrative Officer (CAO)
- Chief Financial Officer (CFO)




## What Kind of Companies Need a CISO?

Every company that uses technology to conduct business, regardless of size, can benefit from the expertise of a CISO, with considerations for full-time or fractional roles

depending on your company's scale and regulatory environment. Large companies typically require a full-time CISO and small and mid-size companies can be served by a part-time or fractional CISO.

Further, the emergence of the term “vCISO” or Virtual CISO can complicate the choices and surrounding discussion. For this book, vCISO overlaps with fractional and often means “highly fractional. " It usually means spending 1-4 hours per week in an advisory role at generally smaller companies or those with less-experienced security leadership who need a world-class mentor.

Specific regulated industries (e.g., financial services) *require* a CISO for regulated companies, with a virtual CISO (vCISO) being an acceptable option (see New York State Cybersecurity Resource Center)*. If data confidentiality, integrity, availability, and supporting systems are concerns, an organization often requires a CISO.

** New York State Cybersecurity Requirements for Financial Services Companies, Section 500.4 Cybersecurity Governances states: “Each covered entity shall designate a CISO. The CISO may be employed by the covered entity, one of its affiliates, or a third-party service provider.”*

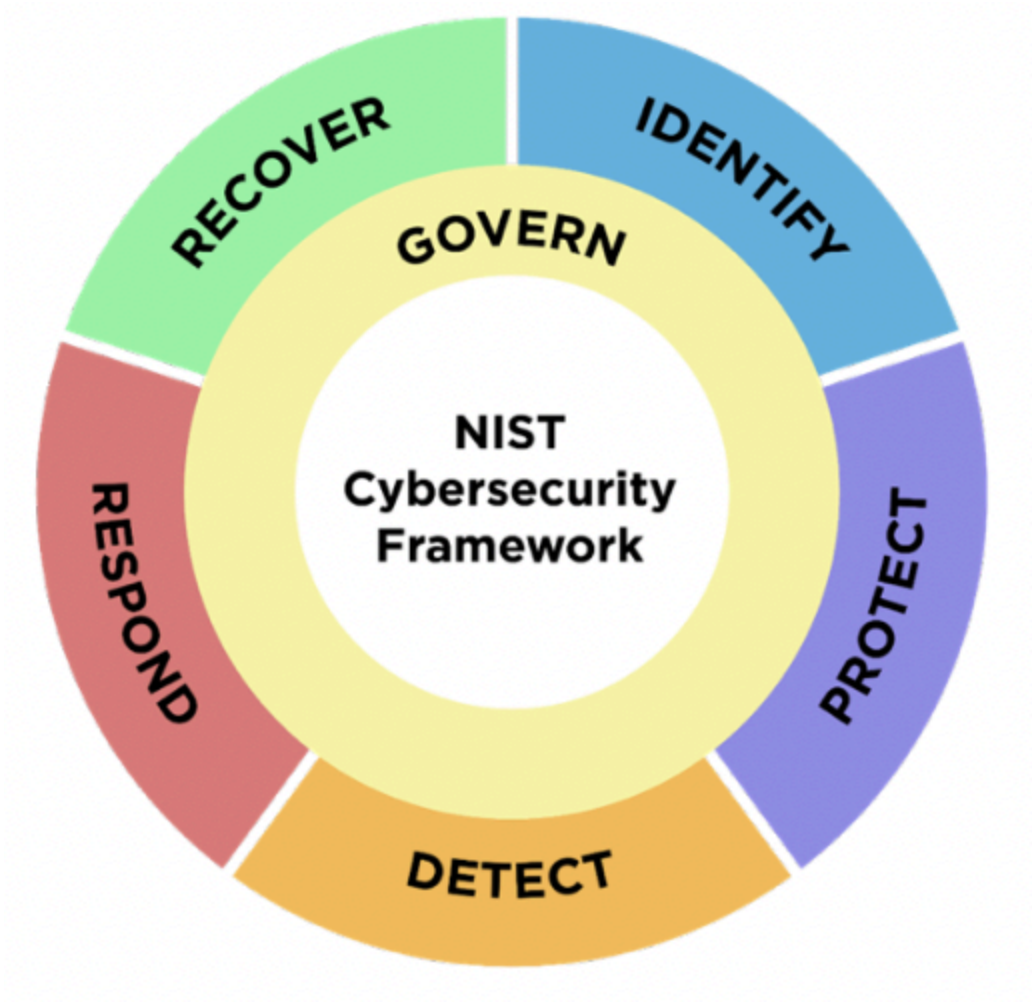
## What are the Key Responsibilities of a CISO?

Well-established frameworks, such as the National Institute of Standards and Technology (NIST) Cybersecurity Framework (CSF), shape the key responsibilities of a CISO. These frameworks provide a comprehensive approach to cybersecurity, spanning strategy development, risk management, incident response, and recovery. Organizations can establish a robust and forward-looking cybersecurity posture by adhering to such frameworks.

According to NIST CSF guidelines, a modern cybersecurity program encompasses six core functions: Govern, Identify, Protect, Detect, Respond, and Recover. Within this structure, the CISO's specific responsibilities include:

- Developing and executing cybersecurity strategies and policies
- Managing security risks across the organization
- Designing and maintaining secure architecture, technology, and infrastructure
- Leading incident response efforts and managing disclosure requirements
- Driving security awareness and training programs
- Conducting third-party (vendor) risk assessments
- Reporting to key stakeholders across various areas, including:
    - Regulatory bodies
    - Compliance authorities
    - Organizational leadership and the board
    - Clients and business partners
    - Employees

This multidimensional role ensures that cybersecurity efforts are proactive, integrated, and aligned with organizational objectives.




Source: NIST Cybersecurity Framework 2.0

## What are the Top 3 Priorities of a CISO?

A CISO focuses on establishing a comprehensive cybersecurity strategy, continuously managing risks, and leading incident response efforts to protect the organization from evolving threats. These priorities prevent security breaches and enable swift recovery when incidents occur, minimizing financial, operational, and reputational impact. The role requires a proactive and holistic approach to cybersecurity that aligns with organizational goals and regulatory demands.  The Top 3 priorities of a CISO are as follows:

1. **Maintain a Clear Strategy for the Cybersecurity Program with Accompanying Governance.** A robust cybersecurity strategy is the foundation of the organization's security posture. The CISO creates and maintains this strategy, ensuring it aligns with business objectives and regulatory requirements. The CISO's responsibility also includes establishing clear governance structures, defining accountability for security outcomes, and ensuring that policies and procedures are implemented effectively across the organization. Governance frameworks, such as NIST CSF or ISO 27001, are often used to guide these efforts, ensuring consistency and compliance while addressing organizational risks and vulnerabilities.
2. **Provide Ongoing Risk Management, Including Operational Threat Management.** Cyber risk management is a continuous process that involves identifying, assessing, and mitigating organizational risks. The CISO oversees operational threat management by monitoring emerging threats, conducting regular risk assessments, and implementing mitigation measures such as robust access controls, endpoint protection, and secure configurations. This priority also includes building resilience against insider threats, third-party risks, and advanced persistent threats (APTs). Effective communication of risks to stakeholders—including the board and executive leadership—is critical to ensure informed decision-making and alignment of resources.
3. **Establish Incident Response Workflow, Crisis Recovery Leadership, and Scenario Planning.** Cybersecurity incidents are inevitable despite preventive measures, and a well-prepared incident response plan is essential. The CISO leads the development and execution of this plan, ensuring transparent workflows, defined roles, and rapid escalation procedures are in place. Crisis recovery leadership involves guiding the organization through incidents to minimize damage and resume normal operations as quickly as possible. Scenario planning, including tabletop exercises and simulations, prepares teams to handle various incidents, from ransomware attacks to data breaches. Additionally, the CISO oversees post-incident reviews to identify root causes, implement lessons learned, and strengthen defenses for the future.



## What Organizational Situations Drive the Need for a CISO?

Several organizational situations drive the need for a CISO:

- Lack of an executive to manage cybersecurity: An organization may lack a dedicated leader with the authority and expertise to oversee and direct cybersecurity initiatives.
- Departure of current CISO: A CISO vacancy creates an immediate gap in the cybersecurity leadership organization’s need to maintain a secure posture.
- The current cybersecurity leader is ineffective: If the organization's current cybersecurity leadership does not meet its needs, a change may be necessary to protect digital assets better and comply with regulations.

- The Organization’s operating market or regulatory needs have changed significantly: If the market or regulatory requirements have changed considerably, an organization may need to hire a CISO with specific expertise to address these new challenges effectively.

These situations underscore the importance of having a competent and dedicated CISO to navigate the complexities of modern cybersecurity challenges and regulatory environments. Keep in mind that “dedicated” doesn’t necessarily mean full-time. Many organizations find that a part-time or fractional CISO is sufficient and allows them to attract a more experienced leader than they might otherwise be able to afford or attract in a full-time role.

## What are some Alternative Titles for the CISO?

The CISO role encompasses a wide range of responsibilities, and its importance in modern organizations has led to the adoption of various titles that reflect its adaptability and scope. Each title emphasizes different aspects of cybersecurity leadership, often tailored to the organization's size, industry, or specific needs. While these titles may vary, they focus on safeguarding the organization’s digital assets, ensuring compliance, and mitigating risks.

Common Titles and Their Focus Areas:

- **Chief Trust Officer.** This title underscores the role's emphasis on building and maintaining trust with stakeholders, including customers, partners, and regulators. The focus extends beyond cybersecurity to include data privacy and ethical governance.
- **Chief Security Officer (CSO).** In some organizations, the CSO is often used interchangeably with the CISO. The CSO may encompass physical and digital security responsibilities, providing a holistic approach to protecting organizational assets.

- **Information Security Officer (ISO). ISO** is a common title in smaller organizations. The ISO often focuses on cybersecurity's tactical and operational aspects and reports to a more senior executive, such as the CIO or COO.
- **VP of Information Security.** This title typically reflects a leadership role in larger organizations. It focuses on managing a comprehensive security program and leading teams responsible for specific areas such as threat detection, incident response, and compliance.
- **Risk Management Officer (RMO).** This title highlights the CISO's critical role in identifying, assessing, and mitigating risks. It is particularly relevant in highly regulated industries such as finance or healthcare.
- **Technology Risk Management Officer.** This variation emphasizes the integration of cybersecurity within broader technology risk frameworks, including operational resilience, vendor risk, and compliance with technology-specific regulations.
- **Director of Security.** This title is common in smaller or mid-sized organizations and reflects a more tactical role. It focuses on implementing and managing day-to-day security operations and responding to immediate threats.
- **Information Assurance Officer.** This title often appears in government or defense-related organizations, where the role focuses on ensuring the confidentiality, integrity, and availability of critical systems and data.

Each title provides insight into the organization's priorities and expectations for the role, ranging from a tactical focus on operations to a strategic emphasis on governance and risk management. Regardless of the title, the role's responsibilities remain pivotal to the organization's success navigating today's complex cybersecurity landscape.

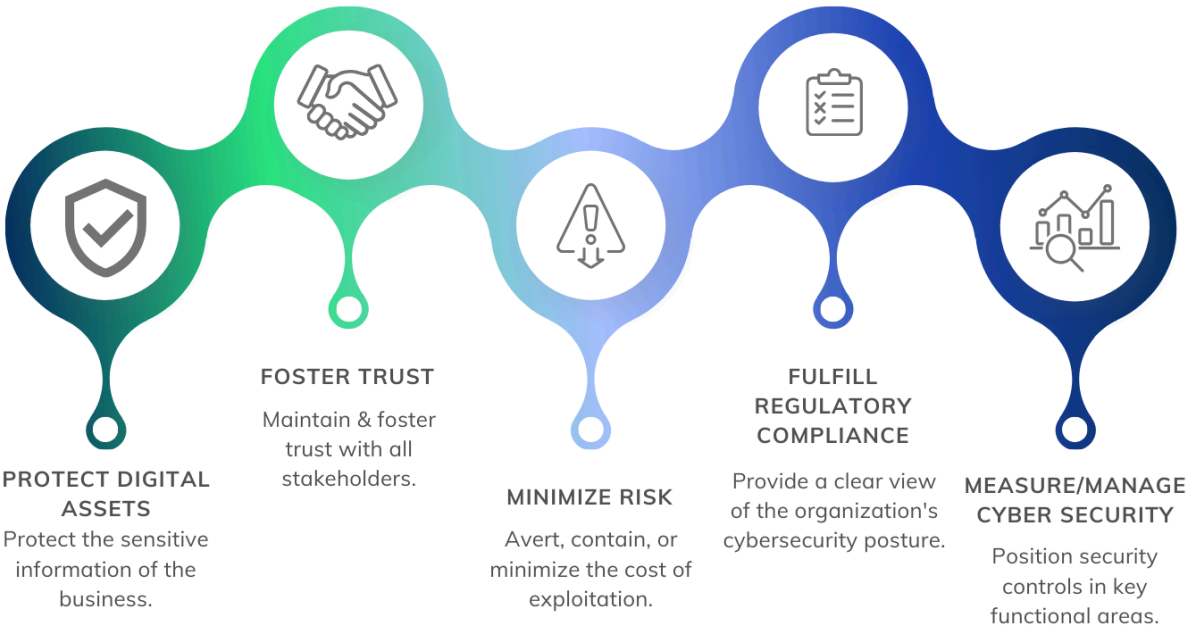
## How Does a CISO Add Value?

Today's business landscape is saturated with cybersecurity threats, making the Chief Information Security Officer (CISO) role indispensable. The CISO delivers immense value by protecting sensitive information and maintaining stakeholder trust. In a world

where cyber incidents are inevitable, their work to prevent, mitigate, and manage the impact of such events is critical. However, the value of a CISO extends beyond risk management—they also reduce regulatory burdens, ensure security investments are well-targeted, and strengthen the organization's overall cybersecurity posture.

A CISO adds value by providing the technology leadership needed to:

- **Protect Digital Assets**. Protect the sensitive information of the organization.
- **Foster Trust**. Maintain and foster trust with all stakeholders, including customers, business partners, internal management, employees, and organizational leadership.
- **Minimize Risk**. A cyber threat represents at least a significant unplanned business cost or, at most, an existential risk to the business. A CISO averts, contains, or minimizes the cost of exploitation.
- **Fulfill Regulatory Compliance**. A CISO can significantly ease regulatory scrutiny and the associated challenges by maintaining and providing a clear view of the organization's cybersecurity posture, which instills confidence in regulators and investors alike.
- **Measure/Manage Cybersecurity**: Positioning security controls in key functional areas, such as the application continuous integration/continuous delivery (CI/CD) process, can save significant time for those functions and avert significant and costly retrofit.





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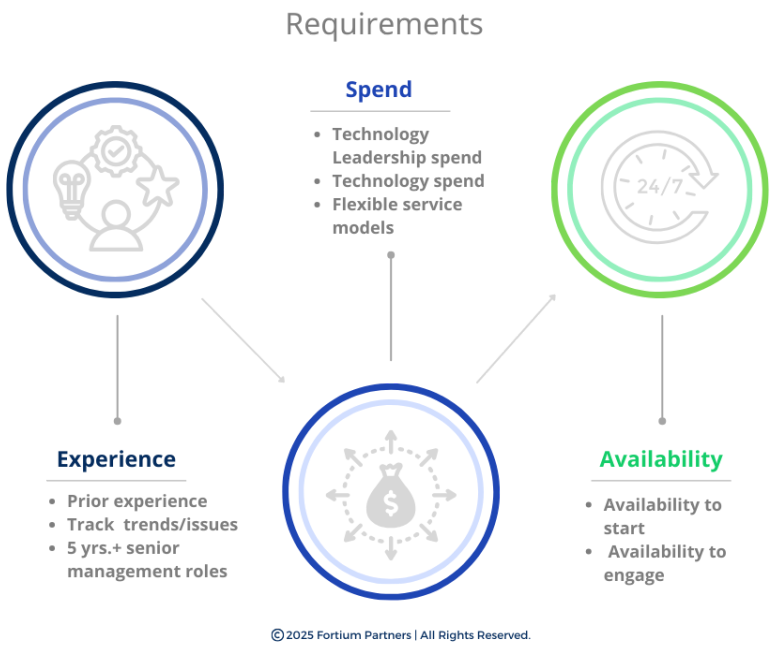
Having laid the groundwork for understanding the pivotal roles of technology leadership—CIO, CTO, and CISO—this book has clarified what these roles entail, how they interact with organizational goals, and the value they bring to technology consumers and creators. We've explored their responsibilities, reporting structures, and the circumstances necessitating their expertise. These insights form a framework to evaluate and appreciate the unique contributions of each role.

Now, equipped with this foundational knowledge, we focus on selecting the right technology leader for your organization. Whether you aim to recruit a full-time executive, engage a fractional leader, or leverage technology leadership as a service, this section provides the tools and strategies to ensure your choice aligns with your organizational needs, culture, and vision. Let’s move from understanding technology leadership to putting it into action.

# How to Select a Technology Leader

Having identified the organizational drivers necessitating a new technology leader, the CEO must now translate those needs into specific, actionable criteria. Three critical factors shape this decision:

- **Experience:** What level and type of experience does the organization need in a technology leader to align with its goals and challenges? The hiring leader must evaluate the candidate's technical depth, leadership capabilities, and industry expertise.
- **Spend:** How much is the organization prepared to invest in securing the right leader and supporting the overall technology function? Balancing affordability with the need for top-tier leadership is essential.
- **Availability:** What level of availability is required? Does the organization need a full-time executive, a fractional leader, or someone capable of stepping into an interim or advisory role?



These three factors provide the framework for evaluating candidates and ensuring that the chosen leader is fit for the organization today and can drive its future success. Looking at these factors in more detail:

## Experience

For a technology leadership role, there are three dimensions of relevant experience. The quality and quantity needed for each type of experience will vary between organizations and are at least partially dependent on what is driving the need for a technology leader.

### Overall Work Experience

Overall work experience encompasses the total years of relevant experience, the type and scope of roles held, and the depth of interaction with executives and boards. For technology leadership roles, critical considerations include:

- **Leadership Positions.** The number of leadership roles held, the duration of each role, and the breadth of responsibilities - including oversight of teams, strategic initiatives, and the ability to drive organizational impact through technology leadership.
- **Organizational Scale.** Experience in variously-size organizations, measured by revenue, employee headcount, and operational complexity. Leaders accustomed to larger, more complex organizations often bring a broader perspective on managing technology at scale.
- **Technology Spend Responsibility.** Accountable for budgeting, managing, and optimizing technology investments. Experience should also include aligning spend with organizational goals while ensuring return on investment and managing financial risks.
- **Reporting Relationships.** The organizational context in which the leader performed the role. CIO and CTO roles typically report to the CEO, while CISOs often report to a CIO or CTO. Roles reporting to another technology leader, such

as divisional CIOs or CTOs, may qualify when performed in large or complex organizations.

Consulting positions that advise technology leaders are valuable for perspective and advisory experience. Still, they are generally not counted as direct CIO or CTO experience due to their lack of formal authority over people, budgets, and strategic execution.

### Industry Experience

Industry experience includes relevant work experience for organizations in a particular industry. As mentioned above, commercial software/SaaS experience is a must-have for CTOs. For CIOs and CISOs, time in an organization's industry is almost always favorable (especially concerning opportunities for innovation). Still, hiring leaders should not overvalue industry experience in these roles. As much as 80% of the knowledge and experience a CIO or CISO needs to be successful is not specific to a given industry. When that experience is required, the leader can learn it relatively quickly from others in the organization or their professional network. Since the nature of the CIO role is often not well-known to non-technology executives, it is essential to avoid overusing industry experience when screening candidates. It may unnecessarily narrow the field of excellent candidates.

### Functional Experience

Functional experience encompasses relevant work within specific technology domains (e.g., applications, infrastructure, security, software development), involvement in diverse technology initiatives (e.g., software implementation, data center consolidation, technology spend optimization), and familiarity with products from specific vendors (e.g., SAP ERP, Salesforce CRM).

While functional experience tailored to an organization's needs is generally advantageous, overemphasizing it during candidate screening can unnecessarily narrow the field. CEOs should avoid seeking technology leaders with overly specific functional experience when such expertise might be better suited to their direct reports, an outsourced partner, or another stage in the organization's technology innovation or

stability cycle. In many cases, broad functional experience (e.g., implementing a similar ERP or CRM from a different vendor) is sufficient when combined with a candidate's other strengths.

Experience by Role

**CIO Experience** includes relevant work experience in several areas critical to organizational success:

- **IT Strategy and Governance**: Developing and implementing technology strategies aligned with organizational goals - including managing enterprise architecture, technology roadmaps, and IT governance frameworks to ensure alignment, risk mitigation, and value delivery.
- **Business Systems and Applications**: The CIO oversees enterprise-wide business applications like ERP, CRM, HRIS, and financial systems. Experience implementing, integrating, and optimizing platforms like SAP, Salesforce, or Workday is often valuable.
- **Data and Analytics**: Leveraging data to drive decision-making through analytics, business intelligence, and data governance initiatives - including experience managing large datasets, ensuring data quality, and implementing tools like Power BI or Tableau.
- **IT Operations and Infrastructure**: Leading IT operations - including data centers, cloud environments, end-user computing, and network infrastructure. Responsibilities also involve disaster recovery planning, operational continuity, and vendor management.
- **Change Management** is managing organizational change resulting from technology implementations or transformations. It includes stakeholder engagement, training programs, and communication strategies to ensure adoption and sustained benefits.

While functional experience in these areas is a significant asset, it's essential to consider the context and organizational needs - ensuring that the CIO focuses on

strategic leadership and delegates execution-level technical expertise to direct reports or partners.

**CTO Experience** includes relevant work experience building commercial software products in the SaaS industry:

- **SaaS Industry Experience** includes relevant work experience with other SaaS companies. SaaS industry experience is essential for a CTO. Experience with SaaS in the CTO role is best, but SaaS experience in non-CTO and consulting roles is also valuable. Experience in a particular industry within SaaS - such as products targeting Healthcare, Fintech, Retail, etc. is not essential as the majority of the industry experience required for a CTO to be successful is specific to software and the SaaS delivery model, not the product's target market. Finally, the leadership of the software development function, likely reporting to a CIO in a Technology Consumer organization, is similar to, but not sufficient alone, as a qualification for a SaaS CTO role.

- **Software Product Development Experience** includes relevant work experience building commercial software products in several areas:
    - **Software development**, including writing, testing, deploying, and supporting code for a commercial software company
    - **SaaS Infrastructure**, including physical and virtual compute infrastructure, networking, security, logging and log management, capacity and performance management, monitoring and incident response, and cost management
    - **Development and Security Operations (DevOps and DevSecOps)**, including source code management, test management, continuous integration and deployment, embedding security best practices in all phases of development, and monitoring/response for security threats
    - **Compliance**, including understanding the relevant compliance frameworks, applying the framework and requirements to a given

company and product, and working with customers and auditors to explain and defend the company's security posture.

**CISO Experience** includes relevant work in several key areas essential to safeguarding the organization:

- **Information Security Frameworks**: Expertise in frameworks like ISO 27001, NIST CSF, or SOC 2, including their implementation and ongoing management to ensure compliance and reduce organizational risk.
- **Incident Response and Threat Management**: This position involves leading efforts to detect, respond to, and recover from cyber incidents. It requires experience with tools and processes for real-time monitoring, threat intelligence, and incident forensics.
- **Governance, Risk, and Compliance (GRC)**: Overseeing the organization's GRC activities, including risk assessments, compliance audits, and implementing controls to meet regulatory and contractual requirements.
- **Identity and Access Management (IAM)**: Managing identity governance, authentication, and authorization systems to safeguard sensitive information and prevent unauthorized access.
- **Cloud Security** involves implementing and maintaining security in cloud environments, including Infrastructure-as-a-Service (IaaS) and Software-as-a-Service (SaaS) models. This responsibility also involves understanding shared responsibility models and leveraging tools like CASBs (Cloud Access Security Brokers).
- **Employee Awareness and Training**: Establishing cybersecurity training programs to foster a culture of security awareness, minimizing risks related to phishing, social engineering, and insider threats.

CISO functional experience is most effective when paired with strategic acumen, enabling the leader to address complex security challenges while engaging with executives, boards, and external stakeholders to advance the organization's overall security posture.

## Spend

The discussion of *spend* related to the technology leadership role has two components: how much an organization spends on the role itself (*technology leadership spend*) and how much the technology leader spends on products, services, and people within their organization as a whole (*technology spend*). It is too simplistic to assume that *more spend* is always better or required, and there are nuances to *spend* that play a role in selecting a technology leader.

### Technology Leadership Spend

What an organization can afford or is willing to pay for the CIO, CTO, or CISO role can significantly impact the technology leader they can attract. It can also signal how the organization perceives the role of technology leadership. While it is instinctive for most organizations to default to full-time employment, CEOs should be aware of alternative approaches to solving for technology leadership that offer on-demand, as-a-service models providing full-time, part-time, short-term, and long-term engagement that maximize experience within the three dimensions discussed above. *The right amount of technology leadership spend is that amount of money that will attract the most experienced leader the organization can afford - including through fractional and interim assignments.*

### Technology Spend

The level of technology spend available to a technology leader is the most significant lever in their ability to succeed. However, spending more does not always lead to success; instead, it is about determining and utilizing the **right level of investment** to effectively meet the organization's needs and objectives. The ideal spend is the **least amount necessary** to achieve measurable success while aligning with the following critical dimensions:

- Financials: The organization's revenue, profitability, and financial health influence technology budgets. A thriving, high-margin business may allocate more revenue to technology than an organization under financial strain. Technology leaders must craft strategies that deliver value while respecting budgetary constraints. For instance, a company with limited profitability may prioritize cost optimization through shared services or outsourcing, while a high-revenue company might prioritize innovation investments to sustain its competitive edge.
- Complexity: The size and intricacy of the organization often dictate technology needs. Key factors include:
    - People: The number of employees and contractors that impact licensing, devices, and support requirements.
    - Physical Locations: Geographic distribution, from a single office to global operations, adds layers of complexity in networking, compliance, and user support.
    - Application Portfolio: The scale and diversity of commercial and custom applications and the need for integration, security, and lifecycle management.
    - Infrastructure: The mix of on-premises and cloud environments, including data centers, networking, and virtual infrastructure, as well as their maintenance and scalability needs.
- Industry: Industry norms significantly influence technology spend levels. Some industries inherently require higher investments due to their reliance on technology, regulatory requirements, or customer expectations:
    - High-Investment Industries: Financial services, healthcare, and manufacturing often require robust infrastructure, compliance adherence, and high security.
    - Lower-Investment Industries: Professional services or retail may allocate less to technology, focusing instead on cost-efficient solutions.

  Technology leaders must benchmark spending against industry peers to ensure alignment with expectations and competitiveness.

- Appetite for Risk: Every organization must balance the cost of risk mitigation with the potential impact of risks:
    - A risk-averse organization may spend heavily on cybersecurity, redundancies, and compliance to minimize exposure.
    - A company with a higher risk tolerance might allocate less, accepting occasional risks such as outages or slower adoption of security frameworks.

  This balance is unique to each organization and should guide the technology leader's decisions about priorities and trade-offs.
- Innovation Posture: Organizations differ in their approach to technological innovation:
    - Cutting Edge: Organizations that aim to lead their industry may invest aggressively in emerging technologies, R&D, and custom solutions to gain a competitive advantage.
    - Follower: Cost-sensitive organizations might adopt proven technologies after they mature, focusing on efficiency rather than disruption.

  A technology leader must tailor their strategy to align with the organization's desired position on this spectrum, ensuring that spending matches the innovation goals.

Technology leaders will calibrate their spending by evaluating these dimensions to maximize impact. The **goal** is to precisely tune spend to the organization's needs, risks, and ambitions, not just to minimize or maximize spend. Balancing these factors enables a technology leader to build the most cost-effective roadmap to success while ensuring alignment with broader business objectives.

One of the hallmark capabilities of a world-class technology leader is helping an organization align its expectations of technology outcomes with its capacity to invest in, support, and assimilate those outcomes.  Similarly, unrealistic expectations of technology outcomes in this regard contribute to higher failure and turnover in the

technology leader's role. An assessment by a highly qualified technology leader can help set realistic expectations in preparation for hiring a technology leader.

## Availability

An organization's needs driving the hiring of a CTO may impact the number of possible candidates based on their availability in two areas:

**Availability to start**

Most full-time employment searches at the executive level can take 6-9 months. If the organization has strong secondary leadership in place or engineers an orderly transition with the existing technology leader, a 6–9-month search may not be an issue. However, if a prolonged technology leader vacancy disrupts the organization, puts the continuity of technology initiatives at risk, or prevents the organization from pursuing impactful new technology initiatives, a 6- to 9-month search may pose a big problem. An interim (full-time) or fractional (part-time) technology leader is the best option when near-immediate availability is needed. An added benefit of the interim and fractional technology leader relationship with no long-term commitment is that there is often less resistance to getting started quickly. In contrast, the perceived need for greater due diligence for a "permanent" role will cause the organization and the candidate to move more slowly.

**Availability to engage as the organization needs**

In addition to the immediacy of availability, the organization may need the availability for a candidate to engage in ways beyond traditional full-time employment. Not every technology leader is interested in, comfortable with, or qualified for fractional or interim roles. Technology leader candidates with more experience, excellent financial stability, higher risk tolerance, and an entrepreneurial spirit may be more appropriate for interim or fractional roles.

## What are the options for hiring?

The previous two sections encouraged CEOs to think holistically about the organizational need driving the selection of a new technology leader and reflect on the required experience, spend, and availability before selecting a hiring approach. While executive search remains the most familiar hiring approach, knowing all options empowers CEOs to make the best choice for their organization's short- and longer-term needs. This section reviews the Executive Search and Leadership-as-a-Service approaches to finding a technology leader.

**Executive Search - Search to Own**

Retained executive search firms take a consultative approach to understand an organization considering a search to fill an executive role. The consulting process ensures that each client receives their full attention to craft search priorities and a search strategy that considers what they believe to be their unique needs for the role and the leader. A reputable search firm will often understand the organization's culture, explore the reasons for the vacancy or new role, and become aware of any HR guidelines for the candidate. They may also develop insight into the personalities, work styles, and preferences of the CEO and the intended role's peers and spend time crafting a detailed job description and candidate profile specific to the client's organization. The hiring leaders select a candidate through successive interviews and feedback, and the candidate, hopefully, accepts the offer and transitions into the new role as a full-time employee.

Larger search firms have specialized practices for specific roles, and some search firms specialize entirely in roles within a particular domain, such as Finance, Technology, Human Resources, etc. Fees for retained executive search services typically amount to one-third (33%) of the candidate's first-year cash compensation, including the base salary, signing bonus, and any other projected bonuses. The fee is paid in equal installments upon the start of the search, 60 days into the search, and following a candidate's acceptance of an offer. For a technology leader, this acquisition cost

amounts to approximately 7% of cash compensation over the average tenure of 4.6 years, not including the cost of equity compensation, benefits, severance, and ongoing employment costs, which could easily reach 300% of cash compensation over that same period. The time to conduct a search varies but averages 6 to 9 months from the start of the search to the candidate's start date, during which the client is usually without leadership in the role.

**Leadership-as-a-Service - Access over Ownership**

Leadership-as-a-Service (LaaS) is a managed service allowing an organization to engage vetted, world-class executive leaders in a few days to 2 weeks. Technology Leadership-as-a-Service (TLaaS) is the LaaS concept applied exclusively to the CIO, CTO, and CISO roles. A critical differentiator is that LaaS firms find technology leaders *before* clients approach them with a technology leadership need. In contrast, Executive Search *starts* the search after a client contacts them. While search firms spend 6–9 months finding the 'right' leader, LaaS enables organizations to hit the ground running in as little as 2 days—saving up to 95% of the time typically spent without critical leadership in place.

Leadership-as-a-Service executives bring unmatched value by combining two distinct and robust dimensions of expertise: extensive time ***in*** the role and deep knowledge ***of*** the role. The largest firms offering LaaS have seasoned executives who have not only spent decades successfully leading as CIOs, CTOs, or CISOs but also possess a collective wealth of insights, strategies, and best practices gained from advising countless organizations. This dual perspective—practical experience executing the role and strategic mastery of its nuances—ensures clients receive leadership that is both effective and transformative. Network effects increase the value of LaaS. The larger the firm, the more valuable the synergies gained.

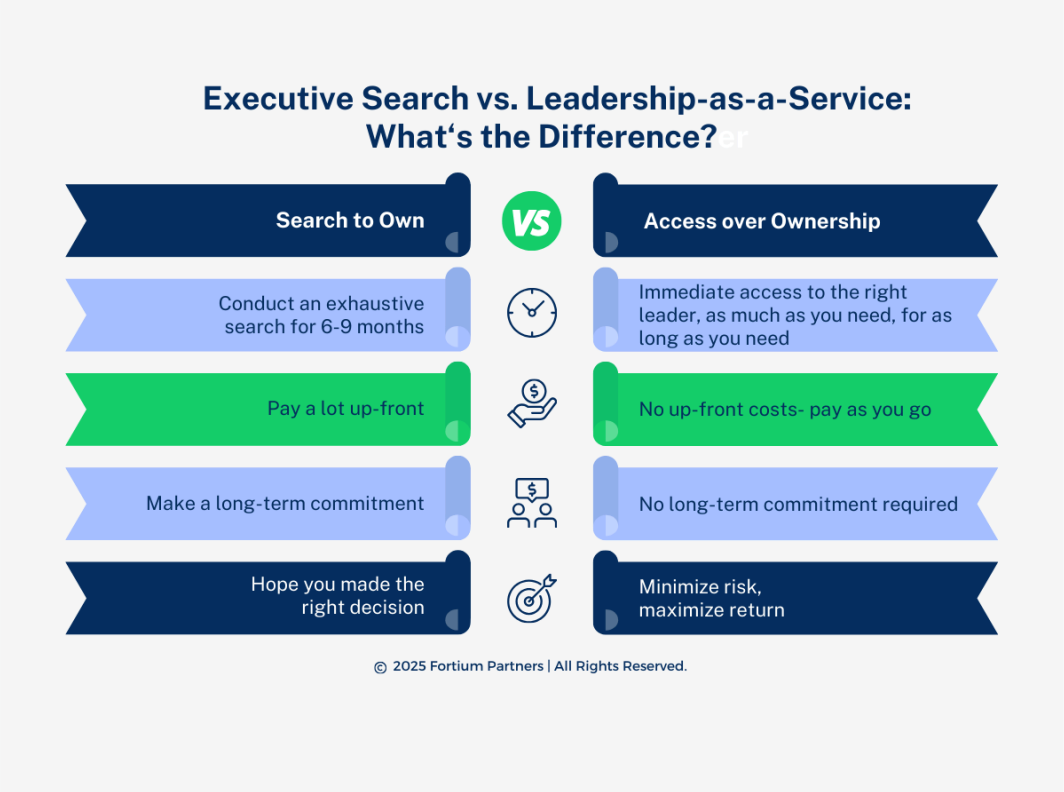
TLaaS may be appropriate when an objective review of the organizational needs, required experience, spend, and availability allows for a technology leader in an interim

or fractional role.  TLaaS may also offer a technology leader in a situational leadership capacity to facilitate an important initiative such as an assessment, transformation, or consolidation for a specific outcome.

- Fractional technology leaders engage for 1-2, 2-3, or 3-4 days/week. The relationship is generally open-ended and continues as long as the arrangement works for the client and the leader.
- Interim technology leader roles are full-time and generally assumed to end when a full-time, employed technology leader is found—usually through an executive search. Hybrid models allow a fractional or interim leader to become an employee of the client without requiring a long-term commitment while remaining connected to the larger community of technology leaders. Finally, most Leadership-as-a-Service firms offer a path for the executive to become a full-time client employee for a placement fee.

In contrast to up-front fees for executive search, Leadership-as-a-Service embeds fees for the leader in the monthly cost.  Fees only last as long as the leader provides the needed value and can increase or decrease in response to the natural rhythm of innovation and stability over time.  Models vary, but a general rule of thumb is that Leadership-as-a-Service costs, on average, about 20% more than the base salary of an equivalent leader in a full-time role.  Compared to full-time employment, that's about 100% of the cost of employment over the same period (4.6 years) - ⅔ **less with more flexibility and less risk**.  Further, the cost of a technology leader for 2-3 days per week with more experience across all three dimensions without hiring risk may be similar to, or less than, the combined acquisition, ongoing, and severance cost of a full-time, employed, possibly less-experienced, technology leader with the associated hiring risk.

Executive search offers a custom approach to finding a *perceived* perfect fit for an expected long-term role.  In contrast, Leadership-as-a-Service provides a ready pool of experienced leaders for immediate engagement under flexible terms.




## How does the CEO make a final selection for a Technology Leader?

After considering the organizational need driving the selection of a new technology leader, reflecting on the required experience, spend, and availability, and reviewing the two approaches to hiring a technology leader, the CEO will need to choose a hiring approach and make a final selection of a technology leader. The good news is that either approach can produce equally qualified and effective technology leaders. The right choice for a given organization, in a particular situation, at a given time will influence the hiring approach and final technology leader selection. The options for choosing the Executive Search or Leadership-as-a-Service are covered below.

**Choosing Executive Search**

The retained executive search model may be the obvious choice if:

- The organization feels most comfortable with a traditional search,
- The assessment of the needs, required experience, spend, and availability suggests a full-time, employed technology leader is best and
- There is confidence in the organization's ability to match a candidate's capabilities with the organization's needs.

### Select a Search Firm

There are over 5,000 search firms in the United States and 20,000 or more worldwide, so there is no shortage of choices. The more specialized the firm, or practice within a firm, is toward the technology leader role and possibly even the technology leader role within a given industry, the more likely the firm will be familiar with qualified technology leaders when the firm reaches out to discuss the role. Demonstrated experience completing technology leader searches with references to satisfied clients is a must. The long search process involves many hours of discussing the role, the profile, the candidates, and the offer strategy. Finding senior leaders and associates of the firm that match the organization's values and are enjoyable to work with can make the entire process more pleasant.

### Frame up the Role

The search process emphasizes crafting a specific profile that will be most successful in the role at a given organization. The hiring leaders take great care to get input from multiple sources to arrive at a composite profile representing the perfect candidate. Finding the ideal candidate is a great goal, but the technology leader role is relatively static across organizations and industries at any given time. Don't get creative in defining the role. A great technology leader knows how to be a technology leader and is a living profile. Maximize candidate experience and tenure.

### Evaluate Candidates

The highest predictor of success in a technology leader role is past success in a technology leader role and is likely not unique to the organization. When evaluating technology leader candidates, consider the following observations:

- Success in the technology leader role is best reflected by the number and duration of technology leader roles served. There is no substitute for experience "in the seat," and change teaches lessons. More technology leader role experience is better than less technology leader role experience. Place the most value on candidate experience.
- Assume leadership in prior organizations acted rationally, keeping successful technology leaders longer and exiting unsuccessful technology leaders sooner. Also, assume technology leaders acted rationally, staying longer in circumstances where they could be successful and leaving those where they could not. There are exceptions, of course, but assuming rational behavior is a good start.
- The success of a technology leader of any given organization is highly dependent on factors outside of their control. What worked in one organization at a specific time, with certain people under particular circumstances, may not work in another where all those factors are different. Adaptability is necessary to succeed anywhere, but some organizations contribute more to the failure of the technology leader role than the technology leader themselves. Not all such claims by candidates are excuses.

### Make the Selection

The average tenure of a technology leader is 4.6 years (adjust up or down over time - it's several years), so the pool of available and interested candidates will be different in the subsequent technology leader search. Organizations cannot eliminate all hiring risks. Select the most experienced candidate available at the time and emphasize being an organization that can contribute to technology leader success and commit to early detection of, and fast response to, a poor fit (e.g., fail fast).


## Choosing Technology Leadership-as-a-Service

If the analysis above fails to suggest a definite choice between Executive Search or Leadership-as-a-Service, or the potential to immediately engage a world-class, full- or part-time technology leader with little hiring risk is attractive, Leadership-as-a-Service is a compelling choice.

### Selecting a Technology Leadership-as-a-Service Provider

There are far fewer individuals and Leadership-as-a-Service firms offering fractional and interim technology leader services than there are search firms, so finding one may prove more challenging than engaging one.

- A CEO's network is a good source of referrals. It includes other CEOs, Board members, Private Equity and Venture Capital firms, past colleagues, trusted advisors such as attorneys, CPAs, bankers, consultants, executive peer group chairs and members, and other leadership-as-a-service providers offering finance, sales marketing, operations, legal, and people leaders. Another option is to check the significant search engines for relevant terms such as "interim technology leader" and "fractional technology leader."
- Among the referrals or search results, value the number and breadth of individuals available to provide technology leader services.  A single individual can be an excellent choice if they are available and interested in the work.  A

more prominent firm with tens or hundreds of resources will provide more choice, is more likely to have experience specific to a given industry or situation, can more readily offer additional or different resources as needed, and increases the effectiveness of any given technology leader through a vibrant community of fellow technology leaders. A firm with many resources indicates that its business model is attractive to the technology leader and that there are enough clients to keep them as busy as they want.

- With a short list of individuals or providers, visit their website, check LinkedIn, and contact the firm's leaders via chat or email to start the conversation. Get a feel for their experience, connections, and the quality of their online presence. A successful provider will offer education online, respond quickly, and be ready and willing to help solve the need for a technology leader or advise on alternative solutions.
- An initial discussion with a leader with extensive experience helping organizations evaluate and select fractional and interim technology leaders will uncover specific requirements and prompt deeper dialog about the factors that will produce the best fit among available resources.
- Based on the organization's preferences and the resources available to fulfill the request, the provider presents one to three technology leaders with associated biographies and experience. Some situations prompt a proposal covering the understanding of the situation, the approach to solving the need, and a discussion of the proposed people.
- If a proposed technology leader is acceptable, an agreement between the organizations is signed. The new technology leader may start as soon as the technology leader and client can arrange a mutually agreeable date.

### Getting Started with Technology Leadership-as-a-Service.

Most fractional and interim technology leader providers will be able to get started very quickly, often providing viable candidates within hours to days and beginning within one to two weeks if speed is essential.

Leadership-as-a-Service in Action.

Once the fractional or interim technology leader starts, they start doing what technology leaders do - assuming responsibility and accountability to support the organization. Generally, they operate like any technology leader - attending leadership and Board meetings, providing status updates, managing the technology organization, interacting with customers and vendors, and carrying out the responsibilities and priorities of the technology leader role. Interim roles are full-time and expected to be available just as any executive would be. Fractional roles are part-time and expected to be available on a regular, agreed-upon schedule and as-needed on a best-efforts basis. Fees are usually invoiced monthly or twice monthly. Larger firms have sufficient resources for ongoing contact with the firm's leaders as necessary and administrative support for resolving issues and smooth operation. Fractional and interim roles can be short-term or extended for years when there is a good fit, and the organization believes the value proposition meets its needs.

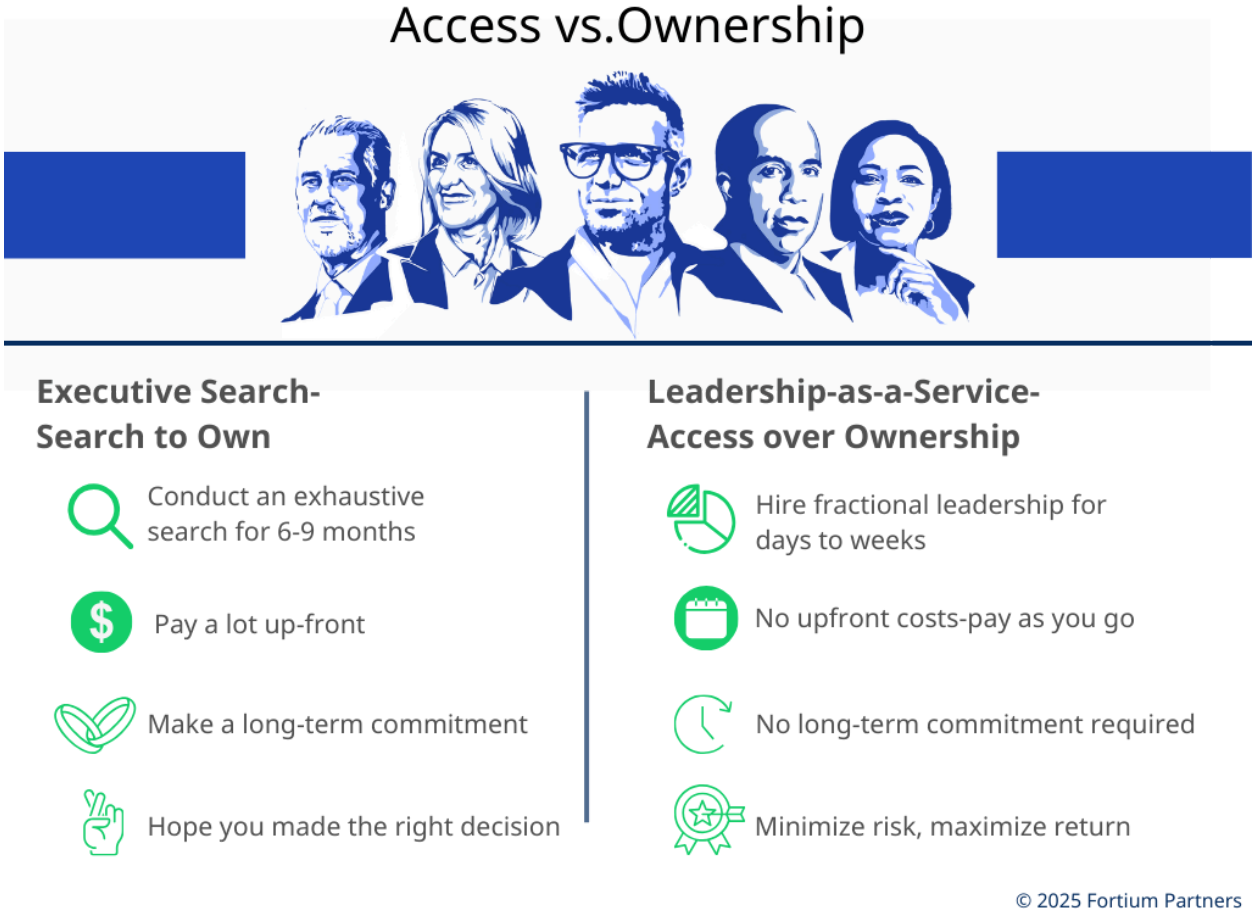

As mentioned above, even if the organization has chosen Technology Leadership-as-a-Service to solve its technology leadership needs for a particular time or situation, Executive Search is often used to find a full-time employee. Most providers have good relationships with search firms and can make referrals when needed.

Combining Technology Leadership-as-a-Service and Executive Search

Executive Search and Leadership-as-a-Service are not mutually exclusive. Executive search is almost always part of the interim technology leader engagement. It can be a part of the fractional technology leader relationship when it's time to transition to a full-time employee. The fractional or interim technology leader can be one of the most objective and qualified participants in the search:

- Having spent ample time with the CEO, Board, and peer executives, they understand what the new technology leader must do to be successful and what the organization must do to contribute to that success.
- Based on a deep personal understanding and working knowledge of the organization's needs, they can help evaluate candidates to determine the best fit. They can also be an informed and technically adept voice to the potential candidate to help them understand the opportunity, give insight into the organization and its people, and describe any specific capabilities or approaches needed to succeed.
- If all parties agree, the fractional or interim technology leader can continue to provide services through the transition to give the new technology leader extra time to focus on the most critical issues or even act as a force multiplier to augment the new technology leader’s capabilities to tackle some essential initiatives.

Even if the organization has started an executive search and has not engaged a fractional or interim technology leader from a Leadership-as-a-Service provider, it's not too late! Doing so will take some pressure off the organization to make a quick decision and provide reassuring coverage for the role. At the same time, the search is ongoing and, as explained above, can contribute positively to the search and transition after selection.




# Conclusion

As this guide draws to a close, let's reflect on the essential insights shaping our exploration of technology leadership. At its core, technology leadership is not simply about managing tools or systems—it's about guiding organizations through transformation, aligning innovation with strategic objectives, and ensuring resilience in a world of constant change.

## The Critical Role of Technology Leadership

We began by emphasizing that technology leadership is indispensable across all organizations, whether they consume or create technology. CIOs, CTOs, and CISOs are more than functional leaders—they are the architects of innovation, security, and operational efficiency. Their impact ripples through every aspect of an organization, from strategy and operations to culture and growth.

## Navigating the Leadership Landscape

Choosing the right technology leader is a nuanced process. This guide has demystified the roles and responsibilities of CIOs, CTOs, and CISOs, shedding light on their unique contributions and the circumstances driving their need for expertise. Whether an organization grapples with growth, innovation, or heightened security risks, it is paramount to select a leader who aligns with its vision and values.

## The Decision Between Hiring and Accessing Leadership

One of the most consequential decisions is hiring a permanent executive or leveraging Technology Leadership-as-a-Service (TLaaS). Permanent hires provide stability and long-term alignment but often require significant time and investment to onboard effectively. TLaaS, on the other hand, offers a nimble, cost-effective alternative. It delivers immediate impact through experienced leaders who integrate seamlessly into an organization's structure.

While TLaaS can be deployed 95% faster and at nearly 100% less cost over a multi-year horizon, it is not a one-size-fits-all solution. The decision ultimately hinges on an organization's specific needs, timelines, and goals. Organizations can chart a path that maximizes value and minimizes risk by understanding these dynamics.

## Balancing Innovation, Security, and Operations

Beyond the structural decision of how to engage technology leadership, the broader mandate of these leaders remains constant: to innovate, secure, and operate. Innovation propels organizations forward, ensuring they stay competitive and relevant. Security safeguards assets and reputations in an era of ever-evolving threats. Operational excellence provides a stable, scalable foundation aligned with organizational priorities. Successful technology leaders balance these imperatives, fostering an environment where all three thrive harmoniously.

## Preparing for the Future of Technology Leadership

The future of technology leadership will continue to evolve, demanding adaptability, vision, and a results-driven mindset. Whether you choose a traditional hiring model or embrace TLaaS, this guide's insights empower you to make informed, confident decisions. With the right leader at the helm, organizations can navigate the complexities of technology and unlock their full potential.

As you take the next steps, remember that technology leadership is not just a functional necessity but a strategic advantage. Your organization can achieve enduring success with a clear purpose and a commitment to excellence.

# About Fortium Partners

As the #1 Provider of Technology Leadership-as-a-Service, Fortium serves public, private, and private-equity organizations through our CIOs, CTOs and CISOs' reputation, responsiveness, and results.

Fortium provides a compelling alternative to the Search and Hire approach with the world's largest team of on-demand, highly-vetted technology leaders. More CEOs and private-equity firms trust Fortium with leaders who can start immediately and deliver value in days (not months) without the risk or long-term commitment of a full-time hire.

Each of the 140+ Fortium Partners:

- Offers 20+ years experience as a technology leader in multiple industries
- Accesses best practices and a deep bench of additional technology experts

Working across many industries, from startups to Fortune 1000 companies, all of our technology leaders use decades of experience to transform our technology insights into business impact and enable technology success to foster business growth

Our partners have delivered bold leadership to the C-suites of the most respected and recognized companies in the world.

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