

SuperTech leaders and the evolution of technology and data leadership

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Too many Chiefs? SuperTech leaders and the evolution of technology and data leadership

Senior executive roles at the Chief or C-level have proliferated over the past few decades. Chief Information Officers came first, in the early 1980s. Chief Technology Officers were common in high-tech firms for technology in products and services in the 1990s, but then moved into other types of businesses. The first Chief Information Security Officer appeared in 1995. Chief Data Officers appeared in the early 2000s, primarily in financial services and later in many other industries. Chief Analytics Officers began to sprout up later in the same decade. Chief Digital Officers appeared with the rise of e-commerce in the early 2010s. Chief Artificial Intelligence Officers appeared late in that same decade, accelerating greatly with the rise of generative AI after 2022.

This proliferation has created a dizzying array of acronyms and combinations. Chief Data Officers (CDOs) were confused with Chief Digital Officers (also CDOs). Chief Data Officers, for example, combined with Chief Analytics Officers to form CDAOs, and then with AI to form CDAIOs. Some CIOs added the title

of CTO or Chief Digital Officer. At least one large company has a “President, IT and Data Analytics” role as well as an “EVP and Chief Digital and Technology Officer,” yet the EVP reports to the CEO and the President does not.

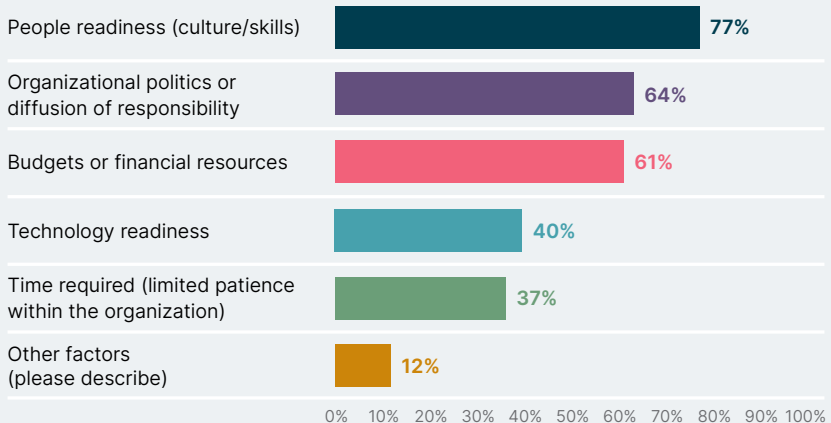
This C-level proliferation has also been seen in some other areas (Chief Customer Experience Officer, Chief Compliance Officer, Chief Diversity Officer, Chief Culture Officer, even Chief Happiness Officer), but perhaps in no other function are there as many C-level roles as in the technology domain. This may be a positive sign of the increasing importance of technology to organizations and of important new technologies like analytics and AI, but it also has a clear downside. The many different technology leadership roles often create confusion in the minds of employees and other executives about who is really responsible for what. If, for example, I am a marketing manager and I need a new customer relationship management system involving hardware, software, communications, data, analytics, AI, and security, to which tech-focused part of the organization do I turn?

This is a high-stakes issue for organizations. Respondents to the survey reported that in 78% of the organizations they represent, the resources of information, technology, analytics/AI and digital are either extremely important or very important. Only in less than 1% of these organizations are these resources “not very important or valuable.” Despite that high importance, only 10% of respondents are very satisfied with their data foundation and capabilities for analytics and AI; 30% are dissatisfied.

In addition to the confusion issue, a broad approach to technology and data is necessary because data still needs refinement for successful use, and there are multiple barriers to success with data management. The survey suggests that challenges preventing success with data goals include factors such as people readiness, politics and diffusion of responsibility (heavily related to overlapping organizational structures in some organizations), budgets or financial constraints, technology readiness and time/limited patience. All of these challenges were cited by at least 30% of respondents, and several by over half. These issues need to be addressed in a concerted and integrated fashion—not only through the adoption of modern data practices, but by continued investment in people, and changes in organizational structure.

What challenges in your organization prevent you from succeeding with your data goals?

Answered: 266 | Skipped:0



In part because of these issues, some organizations are recognizing the downside of C-level proliferation, and have begun to consolidate senior roles in technology and data. In this report we refer to them as SuperTech leaders, although there is of course variation across organizations in the specifics of their roles. To understand the problem and particular solution, we conducted research on the issue (see below). In this report we cover both survey and interview findings to discuss the emerging trend of SuperTech leaders that oversee all or most technology and data functions within their organizations.

About the research

There are two aspects to the research described in this report, which is sponsored by Thoughtworks. An online survey was conducted in the last quarter of 2023 of past MIT CDOIQ (Chief Data Officer and Information Quality) Symposium participants; 266 survey respondents completed the survey. Respondents held multiple technology or data-oriented roles, but their past participation at CDOIQ conferences suggests a strong focus on data.

In addition, 10 senior executives were interviewed in November and December 2023 about the challenges of technology and data leadership, and the possibilities for an integrated leadership role. Half of the executives already had a SuperTech leadership role; the others were Chief Information Officers or Chief Data and Analytics/AI Officers.



The confusion problem and other organizational structure challenges

One of the greatest challenges to organizations with multiple data and technology groups within them is the confusion it presents to internal customers for specific needs and services. In this survey, many respondents reported that their internal customers do not fully understand the roles of different groups and are confused about where to turn for help. 81% said that people in their organizations understand the roles of different technology-oriented groups either only somewhat or not at all. In a related question, when asked if people within their organizations are confused about where to turn for what data and technology-oriented services and issues, 87% of respondents said that they are either completely, to a large degree, or somewhat confused. Only 12% are not at all confused. These results alone would be reason to explore new organizational structures.

Other recent surveys have shown that the Chief Data Officer role in particular is poorly understood. In a 2024 survey of CDOs sponsored by Amazon Web Services, 74% said that their role is less well understood than other C-level roles in their organizations. One energy industry CDO we interviewed

commented, “My job is poorly understood. I wrestle with that every day. It is confusing because there are several organizational groups dealing with technology and data.”

Even the incumbents of technology and data leadership roles often lack clarity about their own responsibilities relative to other tech leaders. 30% of respondents somewhat or to a large degree lack clarity about how their role relates to other senior roles. While not a majority, it’s striking that almost a third of tech and data leaders don’t even fully understand their roles in relation to others.

Admittedly, the integration of senior data and technology roles may not help to prevent confusion among internal customers about where to turn for specific needs. One European CTO/CDO said that one of his senior management colleagues had complained that with the consolidation of data and technology management organizations, it was difficult to know where to turn for what. However, the CTO/CDO suggested that the reorganization had happened only recently and the confusion might be only temporary. Still, however, he suggested that more communications about the new integrated structure might have been helpful.

The confusion issue could have multiple consequences, including the politics and diffusion of responsibilities mentioned above. It could have significant impacts on business users’ ability to get the data and applications they need for better decisions and actions. These confusing organizational structures may ultimately be standing in the way of better organizational performance.



Existing data and technology roles and relationships

Most of the organizations whose leaders responded to the survey had multiple technology and data executive roles. The Chief Information Officer or CIO was most common, with 68% reporting one. Chief Technology Officer was second, with 48%. Chief Data Officers were just slightly lower at 45%. Chief Digital, Analytics and AI officers were less common, with 24%, 14% and 10%, respectively. 18% even had an additional C-level technical role. When asked about how important technology and data are to the organization, results suggest that those who view technology and data as less important also employ fewer people in senior technology roles. Having only a Chief Information Officer was more common among those organizations. Survey respondents overall had a mean of 2.3 senior technology-oriented roles per organization. Of course, larger organizations can perhaps afford or need more senior roles, but it would certainly appear that in some organizations there are too many tech, data and digital leaders to keep track of and for internal customers to make sense of.

Not surprisingly, these tech and data executives report to a wide variety of bosses. 18% say they report to the CEO; the same percentage report to the CIO. 20% report to someone below the C-level, and the greatest percentage report to “other.” As we’ll argue below, with multiple tech-focused C-level roles it’s difficult to imagine that they could all report to the CEO.

With multiple technology leaders, collaboration among them is essential if organizations are to succeed in meeting organizational and customer needs for information. We asked survey respondents—the most common role of which was Chief Data (and/or Analytics) Officer—with whom among technology-oriented leaders they collaborated. The highest level of close collaboration was with the CIO, at 55%. A total of 52% named another close collaboration; CTO was second highest with 43%. Chief Artificial Intelligence Officers (CAIOs) were the least likely close collaborators, with only 20%. Those reporting little or no collaboration with other tech executives ranged from 23% with the CIO, to 63% with CAIOs. The high collaboration with CIOs may mean that it is the most central of all tech roles. The CAIO role is likely to be new and highly technically-focused, so it is not surprising that it is the least likely to be collaborated with.

With which of these executives do you have a working relationship?

Answered: 253 | Skipped: 13

Role	Close Collaboration	Some Collaboration	Little Collaboration	None
Chief Information Officer	55%	22%	12%	11%
Chief Digital Officer	36%	15%	9%	39%
Chief Technology Officer	43%	26%	13%	18%
Chief AI Officer	20%	17%	4%	59%
Other senior information/technology executive	52%	28%	5%	15%

The respondents were also asked which technology and data executives had close collaboration with functional and business unit executives in their organization. CDOs—again, the most common survey respondents—were judged to have the highest level of collaboration with business leaders, with 64% specifying very high or high. CIOs were just slightly lower with 62%. CTOs, Chief Digital Officers and CAIOs were judged less collaborative with the business, with 30%, 20% and 8% respectively viewed as having very high or high collaboration with business executives.

These findings seem reasonable for each role. Other surveys have shown that CDOs are heavily focused on achieving value and must do so by collaborating closely with business partners. The CIO role is mature and the success of its incumbents depends upon being highly collaborative with business stakeholders. CTOs, Chief Digital Officers and CAIOs are likely to be relatively technical and hence perhaps less collaborative with business leaders.

Overall, respondents felt that the lack of collaboration could be costly. When asked if their organization had ever been hindered by lack of collaboration among different tech-oriented functions, 79% agreed. Of course, it is not uncommon for executives we interview to speak of substantial politics and other barriers to collaboration. But the SuperTech leaders interviewed were much less likely to do so.

One of the potential advantages of aggregating tech and data functions under one executive is a greater likelihood of reporting to the CEO. In the survey, 59% of respondents believed that the leader of a combined technology and data function would report to the CEO. The current fragmented situation makes that reporting relationship less likely. Logistically, it is unlikely that a CEO could have three or four direct reports of C-level tech and data leaders. We were told that one CEO of a large investment company recently refused to name a Chief Data Officer because “there are already too many C-level technology people in this company.”

In the survey, 47% of respondents were two levels below the CEO. 34% were three or more levels below the CEO. Only 19% reported directly to the CEO. However, all of the integrated SuperTech leaders we interviewed reported to the CEO. When businesses rely heavily on technology and data, and when all activities related to them report to one leader, that leader is likely to report to the CEO.

Mojgan Lefebvre, the Chief Technology and Operations Officer at insurance giant Travelers, reports to the organization's CEO. She had recently presented to him and the company's board of directors about capital spending plans. In such a data-intensive industry as insurance, it's perhaps not surprising that the great majority of capital projects are in Lefebvre's budget. Few CEOs would want such an important function reporting elsewhere in the organization chart.

When asked about their reporting preferences, almost three quarters would prefer to report to either a senior business executive (31%) or a matrixed relationship involving both a senior business executive and a very senior technology executive (43%). Just over a quarter (26%) would prefer to report only to a very senior technology executive.



Dissenters from this model

Of course, not all technology and data executives believe that an integrated organization and SuperTech leader is a good idea. In interviews we heard that some objections were based on individual attributes of leaders, and some were more principle-based.

Several data leaders told us that they would not be interested in reporting to a Chief Information Officer who is primarily focused on infrastructure and “keeping the lights on,” as opposed to bringing about substantial business change. A previous survey of MIT CIO Symposium participants found that 22% of CIOs say they drive transformation in their companies, 61% partner in transformation with other leaders and 17% take direction on transformation initiatives to execute.

Other leaders had different concerns with an integrated role. Scott Hallworth, Chief Data and Analytics Officer at HP Inc. and who had been interim co-CIO at HP for much of 2023, also has a strong background in risk management in banking and insurance. His concerns about a fully integrated role—particularly the combination of Chief Digital and Chief

Information Officer roles—is that combining the roles would eliminate a check on important decisions within a company. He said in an interview: “It could be dangerous to have all the roles together and might lead to ‘groupthink’ versus healthy disagreement. It’s an important check-and-balance system that exists across industries and functions to avoid material issues. The CIO and Chief Digital Officer roles should at least have separation of executive duties from an accountability perspective.”

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Scott Hallworth, Chief Data and Analytics Officer at HP Inc.

Sanjeevan Bala, Group Chief Data and AI Officer of UK-based TV network and content producer ITV and Non-Executive Director of a FTSE listed B2B business, believes Chief Data Officer and the Chief Information Officer are different jobs and should not be integrated. He commented in an interview:

“There should be a separate and distinct technology function in organizations that is there to put in place technology that reduces time to business value. ITV has kept the data and technology leadership roles separate and distinct, with data reporting into the business units. Historically, many CIOs tend to lead cost centers and to focus on defense (reporting, insight, business intelligence), which doesn’t realize value. But data, data

strategy and AI strategy are not technology problems. In my role the focus is creating value in collaboration with business owners. We need to understand the business process, decisions and so forth. All transformation programs that focus on technology alone will fail; it is often a cultural and people transformation that data leaders need to deliver to be successful and drive stakeholder value and growth.”

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Sanjeevan Bala, Group Chief Data and AI Officer at ITV

Of course, the strengths and weaknesses of organizational structures are specific to individual organizations and the individuals who hold roles within them. It is possible that a particular structure and leader for technology and data would be more or less acceptable to others within the function based on organizational circumstances at the time, and the characteristics of the individuals involved.



Attributes of SuperTech leaders

We can define SuperTech leaders as senior executives who have responsibility for the primary aspects of both technology management and how it is used to manipulate and analyze data. Their titles may include some combination of Chief Information Officer, Chief Digital Officer, Chief Technology Officer, Chief Data/Analytics/AI Officer and even in some cases Chief Information Security Officer. Integration of multiple roles—at least two and sometimes more—is the key component of SuperTech leadership.

Many of the respondents to our survey supported the idea of a unified technology organization. Specifically, two-thirds of the surveyed executives see a combined tech/data/digital organization (with clarity about the different groups and roles within it) as likely to be successful.

We interviewed several such SuperTech leaders. For example, Sastry Duvasthala, the Chief Information and Client Services Officer at financial services firm TIAA, has virtually all of the technology roles at his current employer and at previous jobs: “Having technology, digital, data and analytics reporting to me is my prerequisite for taking the job. I first insisted upon it at Marsh, and they constructed the role that way. I wouldn’t accept the role otherwise.”

Sean McCormack, a SuperTech leader CIO at student transportation giant First Student, said in an interview that full integration brings a variety of benefits for the company: “It involves full transparency of spending. Digital products need an underlying data model so that they can be measured and reported on. It allows a common, integrated digital experience for internal and external customers. And integration has a layered impact allowing growth over time.”

Sebastian Klapdor, CDO and CTO at marketing services firm Vista, said that being in both roles makes it easier to achieve business value from analytics and AI. He noted: “Analytics and AI systems need to be integrated into transactional systems, e-commerce functions and web pages if they are going to be useful and valuable. Having both the data and technology roles makes it much more feasible to achieve that integration.”

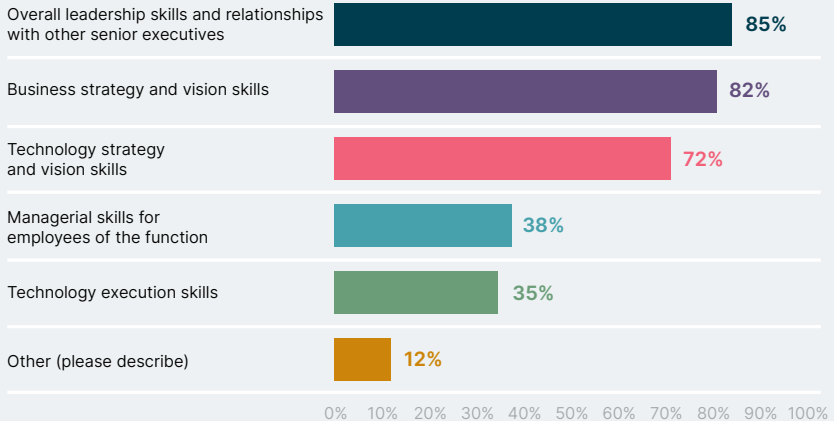
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Sebastian Klapdor, CDO and CTO at Vista

When surveyed respondents were asked what skills a combined tech leader should have, they named overall leadership and senior executive relationships (85%) and business strategy and vision (82%) as most important. Technology strategy and vision (72%) was somewhat less important. Skills involving managing the employees of the combined technology function (38%) and technology execution skills (35%) were viewed as substantially less important.

What attribute do you think would be the most valuable in an overall leader of an information, technology, analytics/AI, or digital function?

Answered: 266 | Skipped:0



These findings suggest SuperTech leaders should be heavily business-oriented, with a technical underpinning. All of the executives we interviewed for this report who have multiple technology roles stated that they have—and that other such leaders would need to have—a primary orientation to achieving business value and pragmatic business transformation initiatives. They speak in terms of business objectives rather than technical ones.

For example, Shamin Mohammad, who is both Chief Information and Technology Officer at CarMax, included in our interview such business-focused terms as market share, omni-channel paths to customers, digital merchandising, competitive advantage, and understanding the business and industry direction. He commented: “To be effective as a technology leader, I have to be a business leader. I am working side-by-side with the CMO, the COO—we are joined at the hip—and then the CFO, the CEO and the board. Execution is table stakes. You have to deliver—it’s not even up for discussion.”

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Shamin Mohammad, Chief Information and Technology Officer at CarMax

The surveyed executives minimized “managing down” skills and technical execution skills, but the SuperTech leaders interviewed suggested otherwise. Several mentioned the importance of hiring strong specialists in each area reporting to them. Duvastrola said that he had people in charge of each of the tech and data functions reporting to him, as well as client services. He said he still codes on occasion as well. Klapdor said that he doesn’t think of himself as driving technical decisions in his role, but he does have a tech background and affinity, including creating small Arduino-based IoT (Internet of Things) devices for capturing sensor data in the cloud. Both of these leaders have at least some degree of technology execution skills.

McCormack at First Student noted, “If you are not a value and innovation-oriented IT executive, it won’t work to oversee technology innovation, analytics and AI, and that sort of activity. If all you’ve done is package implementations, you will not succeed in a broader role.”

Vista’s Klapdor said that a strong business value orientation is key to being asked to lead multiple technology and data-related functions. He was previously Head of Data and Analytics for the company, and focused heavily on achieving measurable value through successful data products. He mentioned in the interview that he believes this was a key factor in being asked to also assume the CTO role.



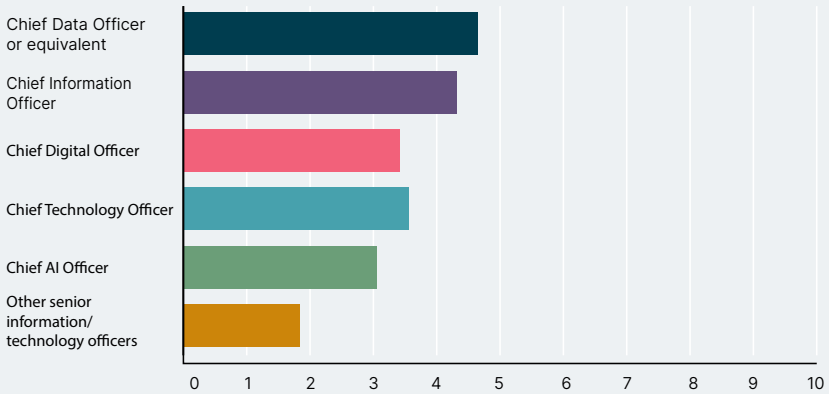
Generative AI and the need for integration

Generative AI provides an illustration of the need for greater integration and coordination among technology and data-oriented groups within organizations. In the survey, we asked what organizations are doing with this technology. Not surprisingly—and as seen in other surveys—most are just experimenting with generative AI. 53% of respondents indicated that their organizations were either experimenting at the individual, departmental or organizational level, or “experimenting but moving toward production deployment.” 23% had a more aggressive approach and were “totally committed to using the technology.” In other words, it’s still early days for most organizations.

But it would also appear that many different groups within the organization are involved in overseeing or coordinating the introduction and use of generative AI. Chief Data Officers, Chief Information Officers, Chief Technology Officers, Chief Digital Officers and Chief AI Officers (in order of their perceived involvement in generative AI strategy and execution) are all involved. While this probably indicates that the potential value of the technology is viewed as high, it may be inefficient or confusing for so many groups to be involved.

Rank the following technology and data executives in terms of their role in generative AI strategy and execution? (1=highest, 5 or 6=lowest)

Answered: 235 | Skipped:31



A more integrated technology and data organization could simply take responsibility for generative AI. Chris Donovan, Chief Data and Information Officer at insurance company Medical Mutual, commented, “There were a lot of people around the company interested in generative AI. To make sure it was implemented appropriately and consistently across the organization, we took responsibility for it.”



Open-ended concerns

We asked two questions in the survey with open-ended responses. One was what one change the respondents would make in their organization's overall data landscape. The second asked, "Can you identify one use case in data for your organization that will make the most impact from a business point of view?"

Analysis of responses to the first question revealed three major issues:

Clearer data governance and ownership

Many respondents mention the need for a clearer scope of the Chief Data Officer's (CDO) function and a demarcation between the CDO office and business lines concerning data ownership and management. This emphasizes the importance of effective data governance and accountability within the organization. Data governance implementation was also frequently mentioned as a "use case" in the second question.

Cultural transformation and data literacy	Several respondents emphasized the importance of fostering a data-driven culture and improving data literacy across the organization. This cultural shift can help organizations leverage data effectively for decision-making and innovation.
Executive leadership structure and investment	Many respondents suggested a need for stronger or different executive leadership, often advocating for tech roles reporting directly to the CEO or similar high-level positions. Additionally, adequate resources and budget allocation for data-related initiatives are mentioned as crucial for success.

In addition to the data governance issue, respondents to the second question about impactful use cases mentioned the following:

Supply chain optimization	This is a critical use case across industries, and optimizing supply chains using data and AI can lead to cost savings, improved efficiency and better customer service.
Customer insights	Understanding customers and their behavior is essential. Utilizing data to gain insights into customer preferences, needs and behaviors can help organizations tailor their products and services, resulting in increased customer satisfaction and revenue.



Actions for the future

The most obvious action that organizations can take to address these issues is to create an integrated technology and data leadership role with an effective, business-oriented executive occupying it. Judging from our interviews, many organizations have already taken that step and appear to have been successful with it.

If for some reason that action is not possible, however, there are other actions that can address some of the issues raised in this report. One, for example, is to create greater role clarity for C-level tech and data leaders and make the role distinctions known to internal customers. Another is to foster more collaboration among diverse tech and data leaders, which can lead to joint projects and higher levels of success in delivering them.

Such collaboration may be aided by creating new roles that cut across existing organizational boundaries. The concept of data products and the role of data product manager, for example, are intended to deliver business outcomes with data and analytical offerings and to mobilize all of the technical resources necessary to achieve them successfully. Even if companies can't get to an integrated technology organization, they could

establish data product management to aid in coordination. In the survey, 80% of respondents noted that they were currently using or considering the use of data products and data product management. Although this is a relatively recent concept, it is getting considerable attention because of the value it can bring to data consumers when well-orchestrated.

It's also clear from the survey findings that technology executives are feeling the heat of time pressure. While extensive collaboration across technology groups can sometimes add complexity and time, well-managed processes for delivering value can improve speed and reduce time to value. Companies and their leaders clearly need to adopt tools, methods and processes that enable them to develop data products faster.

Only time will tell if the problems and issues revealed in the survey and interviews are manifested in more organizations creating integrated organizations and SuperTech leaders. But while we often think of technology as an aid to overcome silos within organizations, technology, data and digital organizations have created silos of their own. It is time to think about how to integrate or work effectively across them.

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