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Gartner for IT Executives

2022 CIO Agenda: A Higher Education Perspective

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The pandemic and shifting economy have complicated how education institutions provide a quality education experience. Higher education CIOs can use data from the 2022 Gartner CIO and Technology Executive Survey to assess how business composability can maximize education delivery moving forward.



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Overview

Key Findings

- Organization leaders, including higher education CIOs, use business composability to restructure in the face of uncertainty and adversity and ultimately achieve results.
- A majority of highly composable enterprises, including some higher education institutions, said they were ahead or far ahead of their peers in overall business performance.
- On average, IT budgets continue to outgrow institution overall budgets, showing a continued shift toward IT dependency in higher education.

Recommendations

Higher education CIOs involved in digital transformation should:

- Promote autonomous, self-organizing teamwork by bottom-up support of the rising fraction of “business technologists” in higher education to achieve increased “frontline” productivity.
- Share accountability among IT, the business and business partners in the ecosystem by creating digitally supported feedback loops that constantly optimizes output.
- Establish iterative development as the default approach by identifying the minimum viable components that improve composability and recomposability, and reduce the risk of incurring technical debt.

Survey Objective

The 2022 Gartner CIO and Technology Executive Survey was conducted to inform CIOs and other technology executives on how composability can improve business performance during times of volatility.

Data Insights

This survey analysis overview complements the 2022 Gartner CIO and Technology Executive Agenda with education-specific findings and recommendations (see The 2022 CIO and Technology Executive Agenda: Master Business Composability to Succeed in Uncertain Times). The analysis is based on data from the 2022 Gartner CIO and Technology Executive Survey and was conducted online from 3 May 2021 through 19 July 2021 among Gartner Executive Programs members and other technology executives. A total of 2,387 respondents participated worldwide, including 235 from higher education. The respondents are members of Gartner Executive Programs and other IT leaders, primarily CIOs.

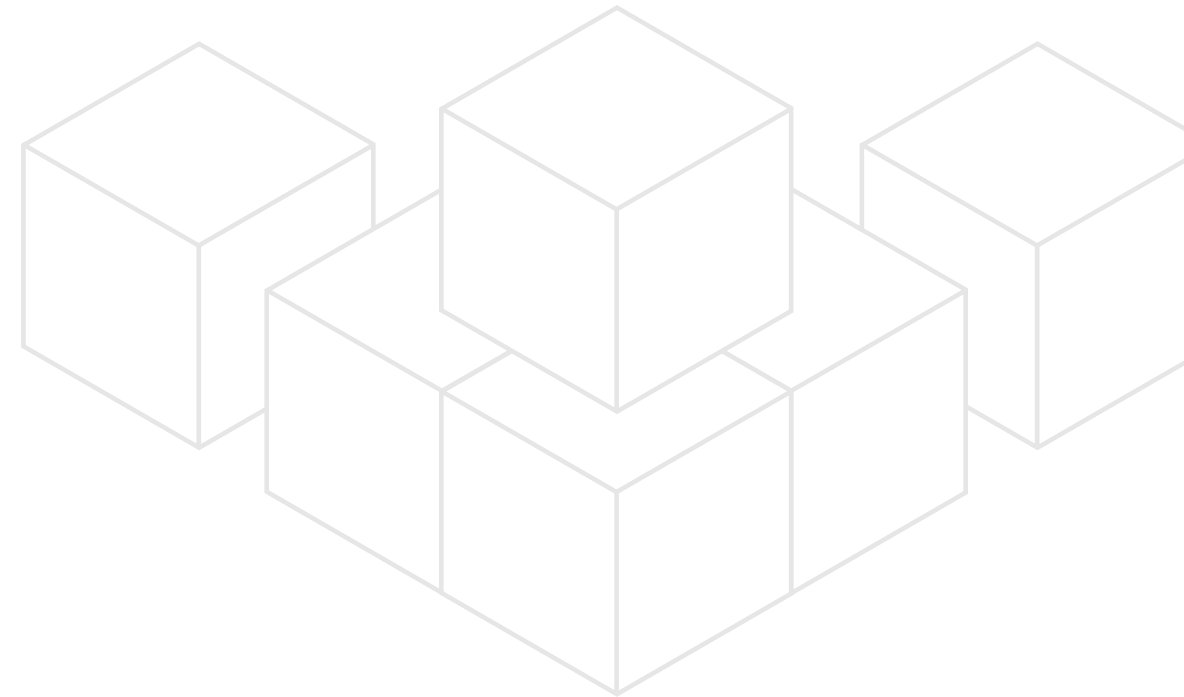
This CIO higher education perspective is divided into the following sections:

1. Business Composability Defined
2. Why Business Composability Matters
3. Business Composability Revealed
4. Composable Enterprises Follow Key Practices
5. 2022 Spending Plans and Technology Trends
6. Industry-Specific Insights
7. Demographics and Survey Methodology

Section 1: Business Composability Defined

As higher education CIOs plan their educational agendas for the coming years, they can look to the immediate past to find a potential blueprint for the future. Change and the ability for higher education institutions to pivot quickly and adapt in an agile manner are becoming the “new normal” way of fulfilling the institution’s mission. External forces — including the pandemic, a fluctuating economy and extreme weather — have forced higher education institutions to revert and reinvent how faculty, staff and students deliver and receive instruction, whether virtually, in-person or a combination of both.

One approach that we see some organizations use to deliver results in the face of disruption is defined by Gartner as “business composability.” Organization leaders use business composability as a means to structure and restructure for uncertainty to achieve results in a volatile world.



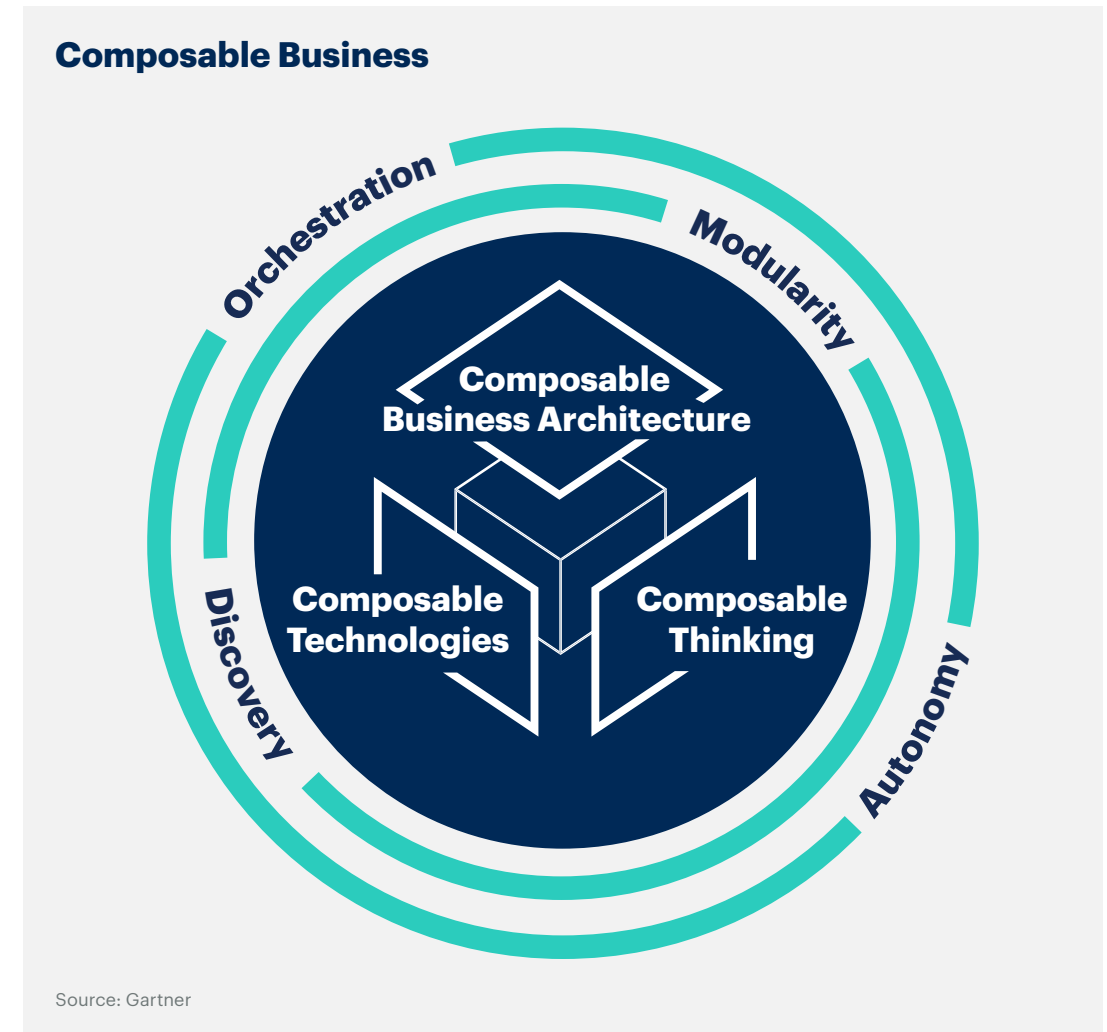
Gartner introduced business composability as a singular approach at the 2020 Gartner symposium (see *Seize the Moment to Compose a Resilient Future: Key Insights From the 2020 Gartner IT Symposium/Xpo™ Keynote*). Business composability is designed to enable the organization to be more agile, deliver better performance and offer improved value in the face of disruption. Business composability applies modularity to a business asset — people, processes, technologies and even physical assets — so that leaders can easily and safely recompose them and create new value in times of flux.

While the concept of composability is not new, Gartner built a framework containing the following core elements to guide implementation in an enterprisewide approach (see Figure 1):

- Composable thinking
- Composable business architecture
- Composable technologies

But the question remains, does business composability deliver?

Figure 1: Business Composability



Section 2: Why Business Composability Matters

The 2022 Gartner CIO and Technology Executive Survey was designed to answer this question (see The 2022 CIO and Technology Executive Agenda: Master Business Composability to Succeed in Uncertain Times).

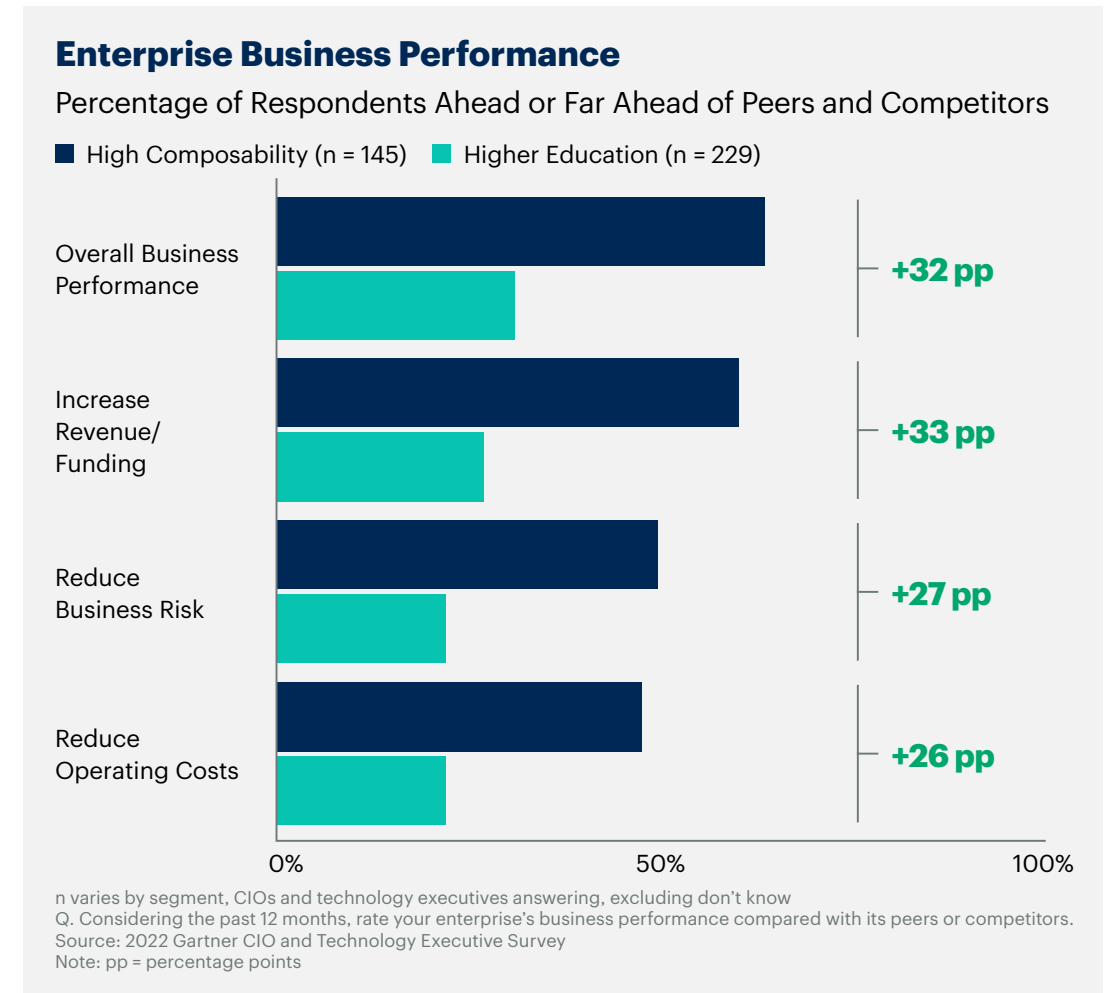
First we identified a cohort of “highly composable” enterprises by asking to what extent they use the three principles of composable thinking, composable business architecture and composable technologies. Only those who answered “widely” or “extensively throughout the enterprise” (6 and 7 on a 7-point scale) qualified (see Evidence section).

Business composability delivers business benefits. Sixty-three percent of CIOs of highly composable enterprises said that they were ahead or far ahead of their peers and competitors in overall business performance. This is better than moderate- and low-composability enterprises and scores better than the higher education CIOs. The superior business performance for highly composable enterprises holds true also in the areas of:

- Increased revenue and funding
- Reduced business risk
- Lower operating costs

In each area, highly composable enterprises out pace higher education (see Figure 2).

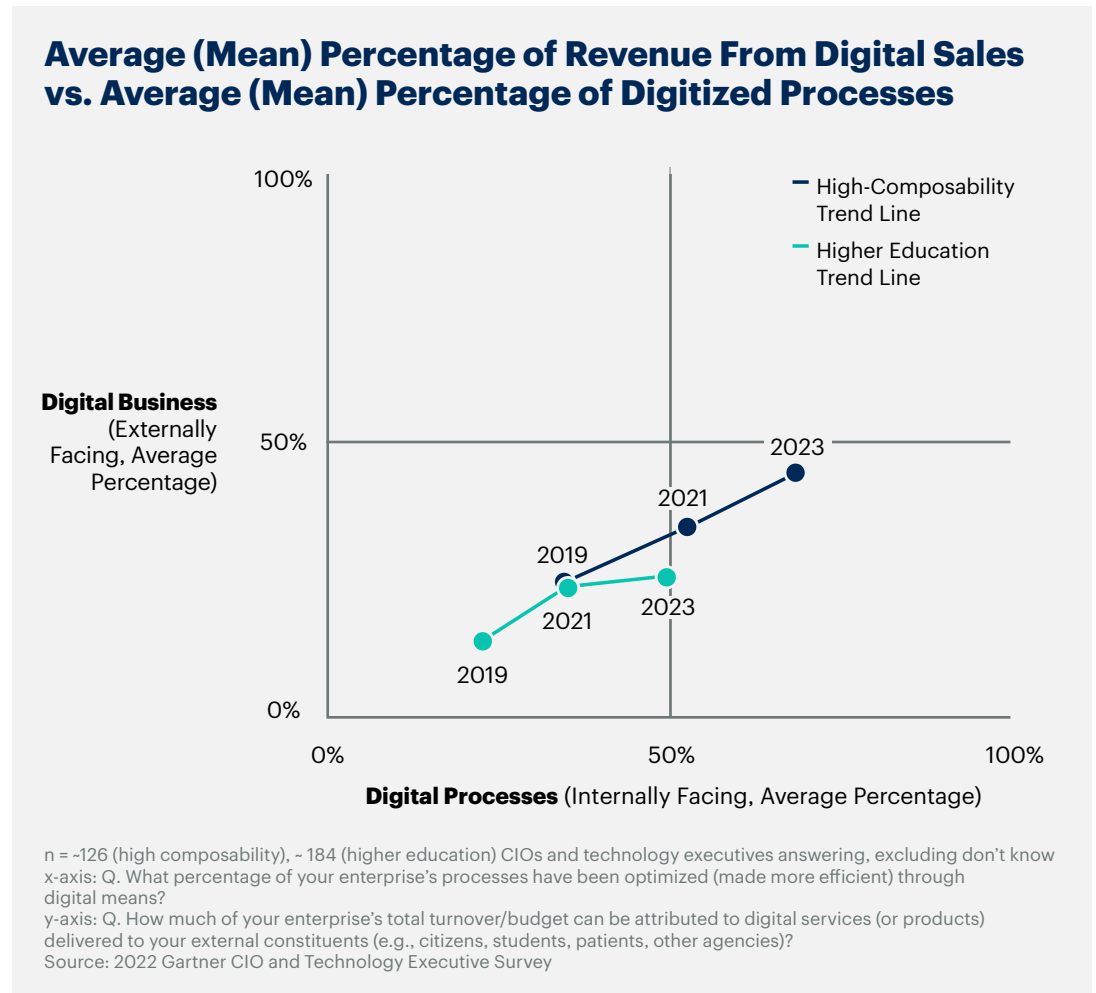
Figure 2. High Business Composability Delivers Superior Business Performance, Even in Times of Volatility



So how can higher education institutions become more composable? There is one overarching answer: Go more digital in one or both of the axes in Figure 3.

Figure 3 shows “digital process” on x-axis with the percentage of enterprises’ internal processes optimized using digital means. “Digital business,” on the y-axis, depicts the percentage of the budget earmarked to externally facing digital services. For example, this area includes online higher education programs.

Figure 3. Highly Composable Enterprises Have, and Expect, High Digital Progress



In 2019, higher education was, on average, slightly above 20% in digital process and slightly above 10% in digital business. High-composability enterprises, on average, scored at higher levels by at least 10 percentage points respectively.

Higher education has made good progress since 2019. However, during the same time, the high-composability enterprises sprinted ahead. For high-composability enterprises, that trajectory will continue through 2023, perhaps even accelerating in the digital business dimension. At the same time, we see overall higher education digital acceleration tapering off, at least in digital business, in a rather disappointing way, considering that higher education is essentially an information industry. As we discussed in 2020, this result is most likely a consequence of mixing apples and oranges in terms of different value propositions and different business models in higher education.

See the following research for more detail:

- [2021 CIO Agenda: A Higher Education Perspective](#)
- [2021 CIO Agenda: Industry Perspectives Overview](#)
- [Engage Stakeholders in Building a Digital Business Roadmap](#)
- [Presentation: Resilience and Beyond In Higher Education](#)

In this context, enterprises that apply business composability extensively have better business outcomes than those that do not. They are also more digital doing that. Therefore, digital is correlated with composability and business outcomes. A key reason for this is likely that digital assets are on average easier to compose, decompose and recombine, at least relative to physical assets.

Section 3: Business Composability, Revealed

There is more to business composability than being digital. But, to identify best practices for becoming a highly composable enterprise we need to unpack the components of composability and what it means for higher education.

Composable enterprises use three key principles (see Figure 4):

- Composable thinking: Ideas that encourage exploration and create key business capabilities.
- Composable business architecture: Business elements that include products, teams and processes, and create new value.
- Composable technologies: Assets and capabilities that include automated modular components.

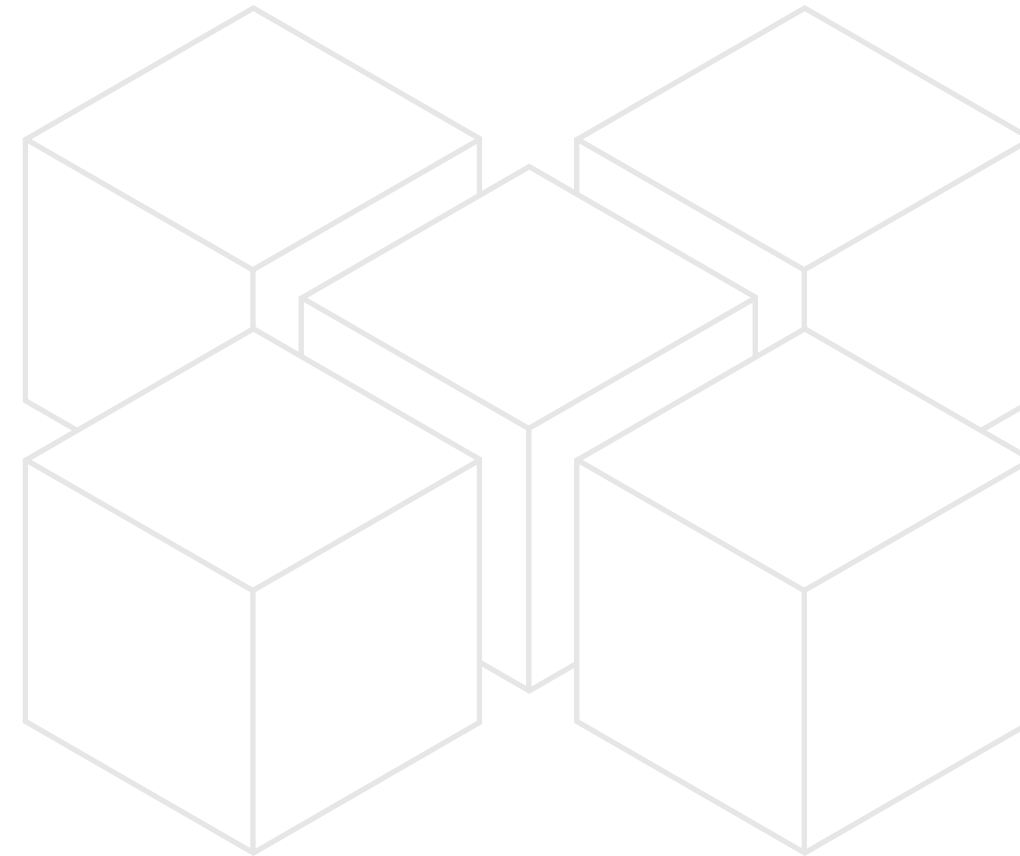
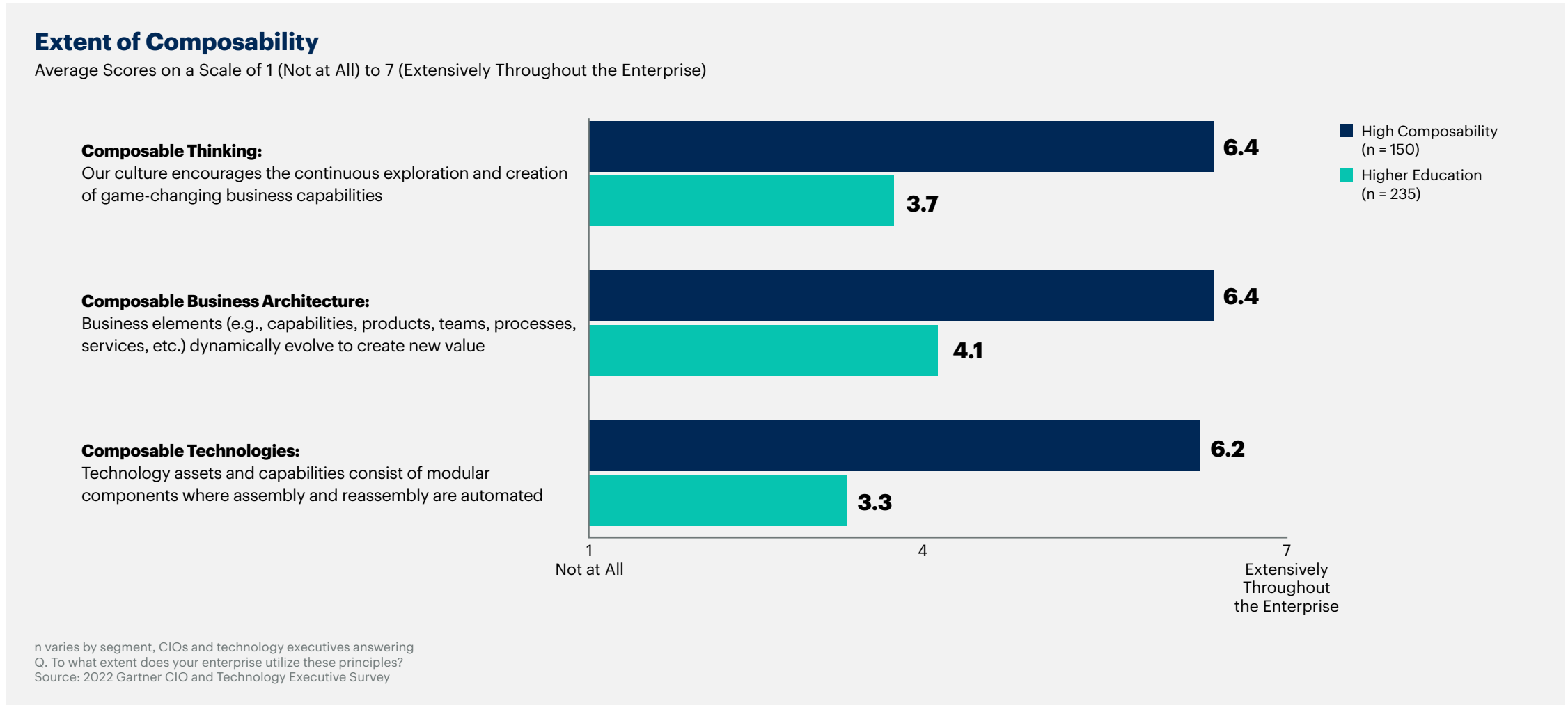


Figure 4. Composable Enterprises Utilize Three Principles



In this survey, a highly composable enterprise uses all three principles “widely” or “extensively” throughout the enterprise (corresponding to a 6 or 7 on a 7 point scale from “not at all” to “extensively”). Figure 4 shows that highly composable enterprises average 6.4, 6.4 and 6.2 respectively, which follows from the definition.

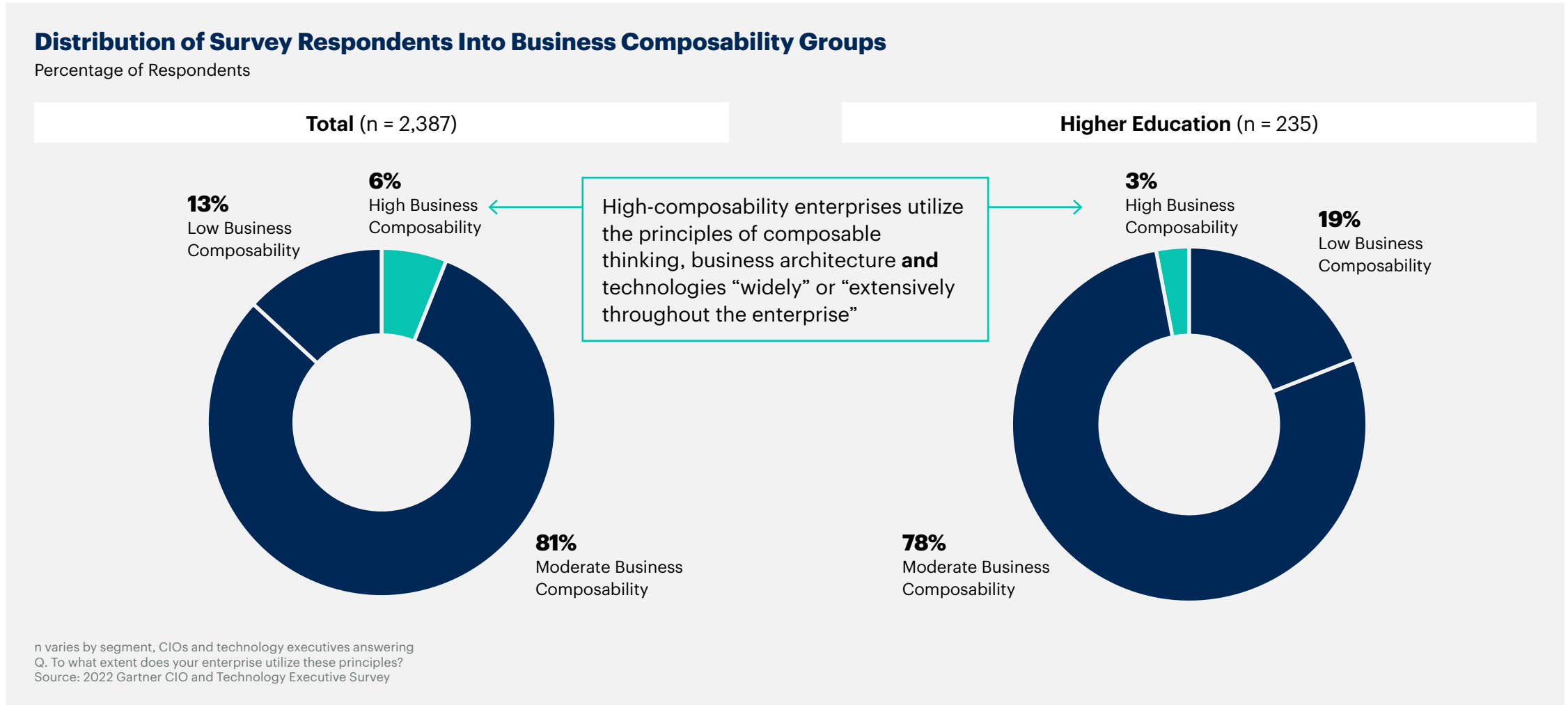
For the higher education respondents, the highest average is in composable business architecture (4.1), followed by composable thinking (3.7) and composable technologies (3.3). This order is not surprising since higher education is very composable by its nature. A business architecture based on departments and schools or faculties matrixed with thinking in lectures, courses and programs.

It is not surprising that the composable technologies principle is last both for higher education and highly composable enterprises since most technology to date still requires a high degree of exactness to work seamlessly. This usually means that institutions must make an upfront investment before accruing any business benefits. Doing so may tempt CIOs to “hard code” to gain business benefits quickly rather than leverage a composable approach that improves speed of change and flexibility for the future.

However, investing in composable principles in technology seem to have long-term business accelerating benefits as Figures 2 and 3 suggest. A technical reason for the lower average scores in Figure 4 is that the higher education sample is composed of a mix of high, medium and low composable enterprises. Overall, out of the 2,387 respondents, 6% qualified as highly composable enterprises, 81% as moderate and 13% as low.

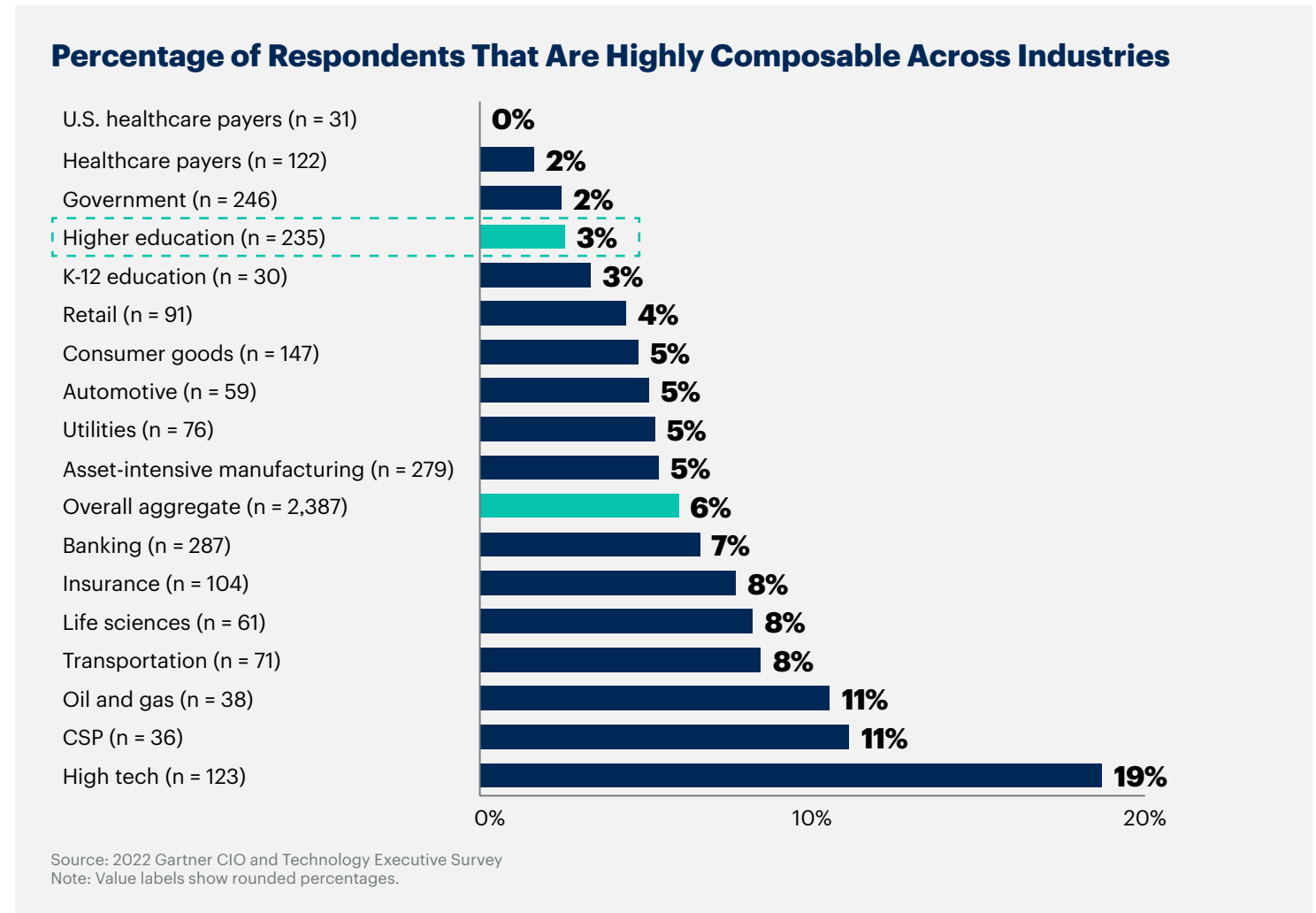
Of the 235 higher education survey respondents, 3% qualified as highly composable enterprises, 78% as moderate and 19% as low (see Figure 5).

Figure 5. The High-Composability Cohort Is Emergent



As we can see, being a highly composable enterprise is an emergent property overall and in higher education. But it is not unattainable. Figure 6 compares the proportion of highly composable enterprises in various industries showing a range from 0% (U.S. healthcare payers) to 19% (high tech). With 3%, higher education is at the lower end of the range in this survey.

Figure 6. High Composability Ranges Widely by Industry



A number of factors can impact the ultimate composability potential in an industry as well as the current level of composability enterprises within that industry.

Possible factors are:

- Commoditization
- Competitive (evolutionary) pressure
- Regulation
- Cultural inertia

For example, the oil and gas industry, as well as transportation, offer a high degree of commoditization that drives composability even though they are physical-asset heavy. These industry ecosystems have evolved standards such as the intermodal container that has evolved into a global extremely composable transportation infrastructure.

Similar factors apply to communication service provider (CSP) and high tech, where working in a digital societal infrastructure drives composability based on standards to reach customers. In addition, competitive pressure drives differentiation that is mainly achieved by innovating at the edges on top of layers of standards rather than creating new fully integrated product segments. This applies in particular to high tech, which could explain the position as the most likely to be composable. There are exceptions, but that usually requires either a new market segment, a lot of funding or an existing monopoly (see Ecosystem Modeling Will Be an Indispensable Tool in Designing Digital Businesses and Creating Competitive Advantage by Mastering Higher Education Ecosystem Models).

At the other end of the spectrum, we have a set of five industries (including healthcare and education) rooted in civic missions that are all people-intensive on both sides of the service provided. These are typically high-stakes services that have fundamental impact on people's lives, and thus resist commoditization. For that reason, these industries are typically highly regulated to foster democratized access to the services. This limits the speed of innovation, which is further hampered by organizational cultural inertia. For these industries to be more composable, technology needs to enable truly mass-customizable services based on complex data input.

Higher education is a very good example of the challenges of becoming more composable. Even if the organization (departments, faculties) of an institution and its products (courses, programs) are composable, the content is often put together, delivered and consumed in a unique manner. The latter is highly dependent on individual professors, topics and students.

However, we believe that higher education needs to become more composable to serve more learners longer. The fast pace of societal and workforce change requires faster, lower stakes learning (see Predicts 2020: Education Needs to Brace for Changes to the World of Work and Predicts 2021: Education — Unprecedented Disruption Creates Shifting Landscape). Insights in time and skills at scale requires a more composable approach to learning such as “stackable credentials,” “nanodegrees” and “micromasters” that allow for smaller investments in time and money to enable faster evolution by variation.

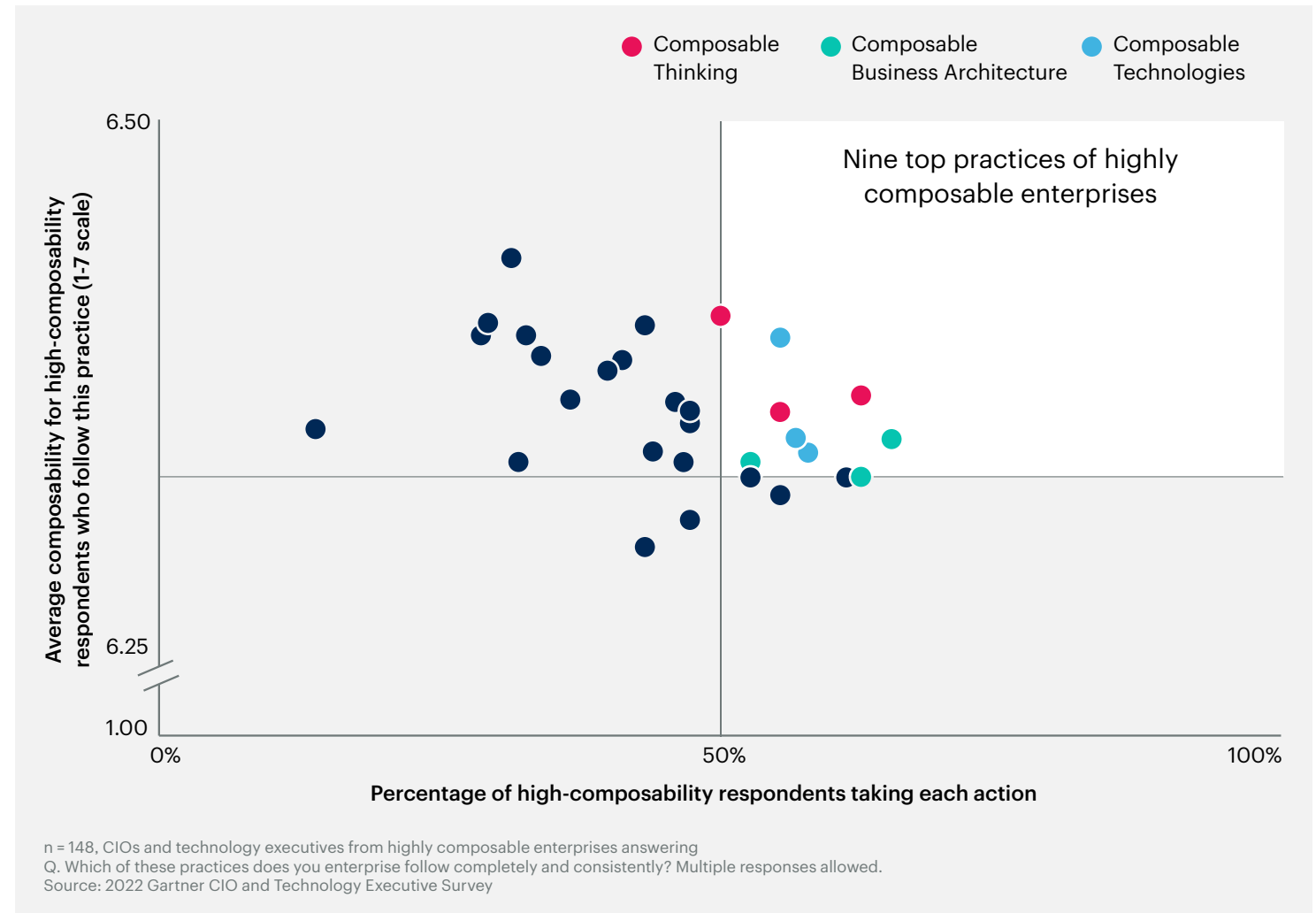
Section 4: Composable Enterprises Follow Key Practices

One objective of the 2022 Gartner CIO and Technology Executive Survey was to identify which practices contributed the most to business composability. Toward that end, we tested 30 practices over the three domains.

The survey sought to discern which area organizations use composable businesses completely and consistently enterprisewide. We asked the question: “Which of these practices does your enterprise follow completely and consistently?”

Of the 30 practices, 12 were used by over 50% of the highly composable enterprises. Of those 12, we identified the top nine that were aligned to the highest average composability of the respondents (see Figure 7). The full practice list is in Note 1 and the top nine practices are discussed below.

Figure 7. Nine Practices Distinguish Highly Composable Enterprises



Key Composable Thinking Practices

In composable thinking, these practices are (in order of use among the highly composable respondents; see Figure 8):

- Practice adaptive strategy to spot and respond to opportunities and threats.
- Promote a high-trust culture that empowers employees to independently make decisions.
- Empower internal functions, product teams, external allies and/or business partnerships to work together through autonomous, self-organizing networks.

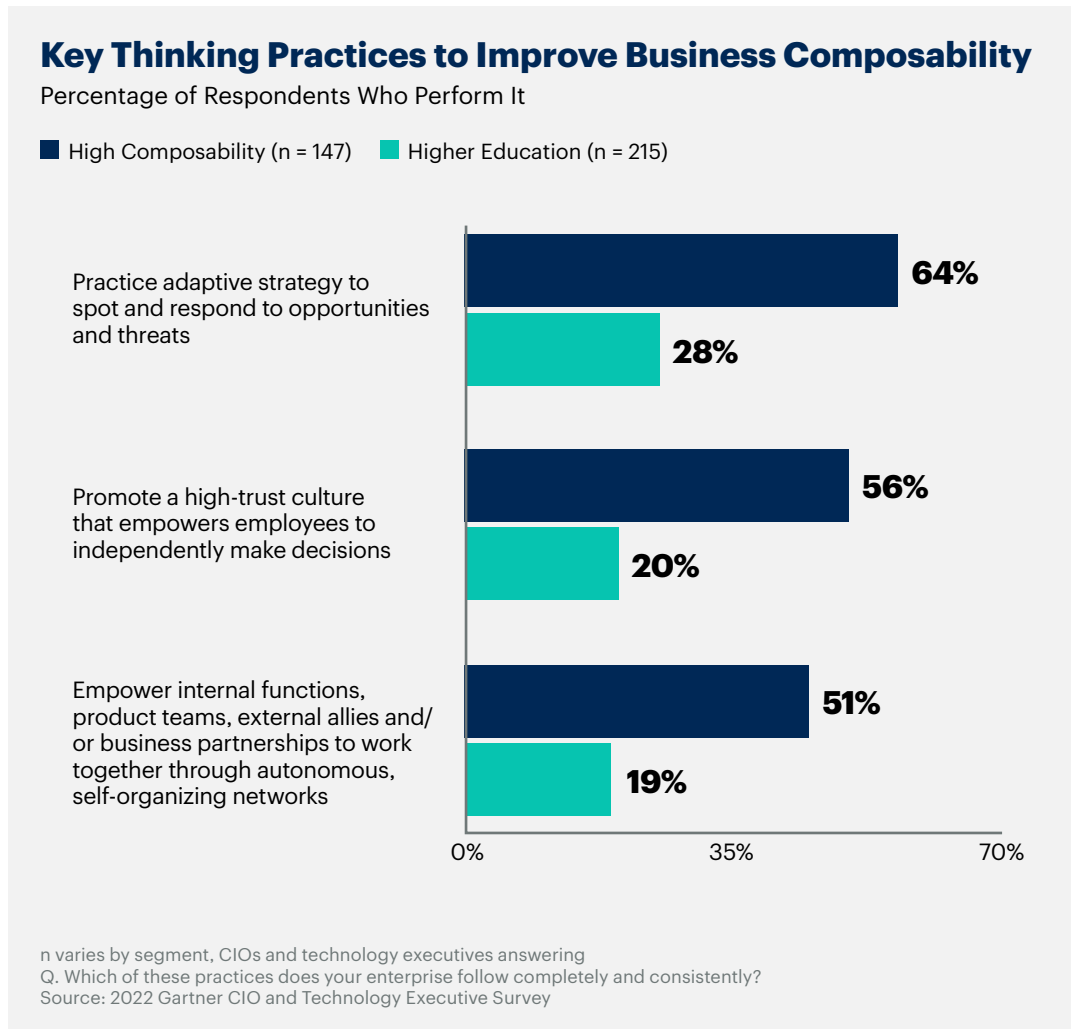
Common theme: Creating agility through empowering employees and cross-functional teams to be able to respond quickly to changing conditions.

Keywords: Empower, independent, self-organizing, leading to practice of adaptive strategy. These three practices are common within higher education research, less common in education and often absent in administration.

This finding could explain the relative lower numbers for higher education respondents that perform each practice.

One reason higher education appears behind in overall business performance is probably not a lack of composable thinking among institution leaders, but a lack of common strategy across research, education and administration to guide the direction of empowered individuals and teams. Composable thinking is part of higher education core culture but lacks the overarching organizing principle to make it more pervasive and drive individual decisions toward a common goal.

Figure 8. Key Composable Thinking Practices



Key Composable Business Architecture Practices

In composable business architecture these practices are (in order of use among the highly composable respondents; see Figure 9):

- Shape multidisciplinary teams to align on value, promote transparency, drive accountability and collaborate on demand.
- Design business processes in parallel with technology capabilities.
- Distribute accountability for digital outcomes beyond the traditional IT organization to other business units/business leaders.

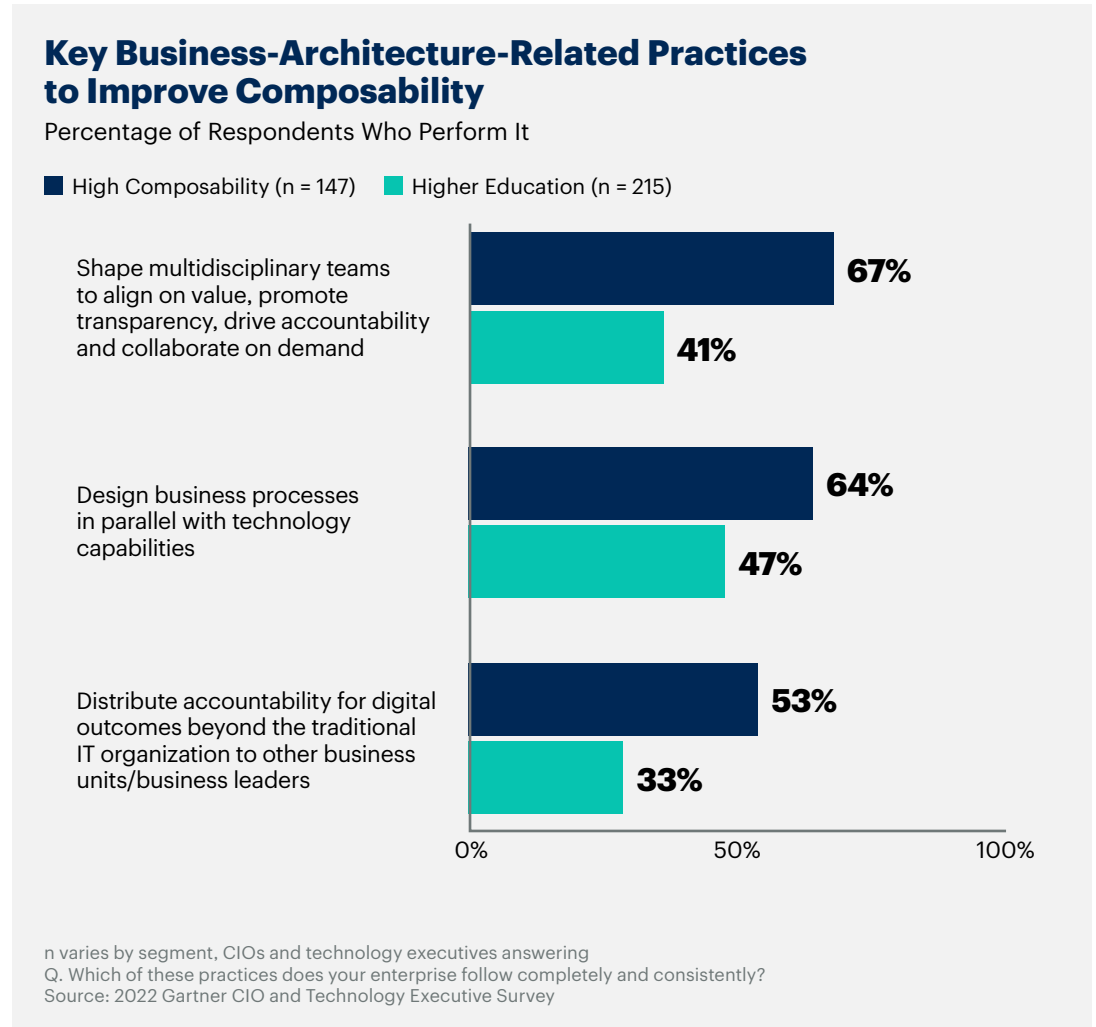
Common theme: Creating business outcomes by co-creation between business and support functions, IT in particular.

Keywords: Multidisciplinary and accountability to design business and technology in parallel. These three practices are more prevalent in higher education than the other six. One reason could be that it is relatively easy to form teams and work on specific business processes in a business that is highly composable by nature (see above). But that does not mean it is done in a complete and consistent way.

Again, the lack of overall guiding strategy and coordination are diminishing the full benefit of these practices. For example, the practice that has the lowest number of “complete and consistent” use is “distribute accountability beyond traditional IT.” Another key reason for the relatively poor business outcome is the relatively lower use of digital (see Figure 3). Higher education could benefit from digitalization, because of its ability to unlock its inherent business composability, both on campus and online. But higher education as a community suffers from not only a big digitalization backlog in institutions that have understood this potential, but also a genuine hesitance in institutions that still are trying to determine their value proposition and what role digital should play in it.

See, for example, *Scaling Higher Education — The Journey to Digital Transformation Goes Through Enablement and Optimization*.

Figure 9: Key Composable Business Architecture Practices



Key Composable Technology Practices

In composable technologies, these practices are (in order of use among the highly composable respondents; see Figure 10):

- Establish iterative development techniques (e.g., DevOps) as the default approach to development.
- Establish continuous and effortless sharing of ideas and access to platforms, tools and knowhow across internal functions, product teams, external allies and/or business partnerships.
- Create dynamic and easily deployable integration capabilities for connecting data, analytics and application components.

Common theme: Creating a stream of innovation by iteration and combination of ideas and data.

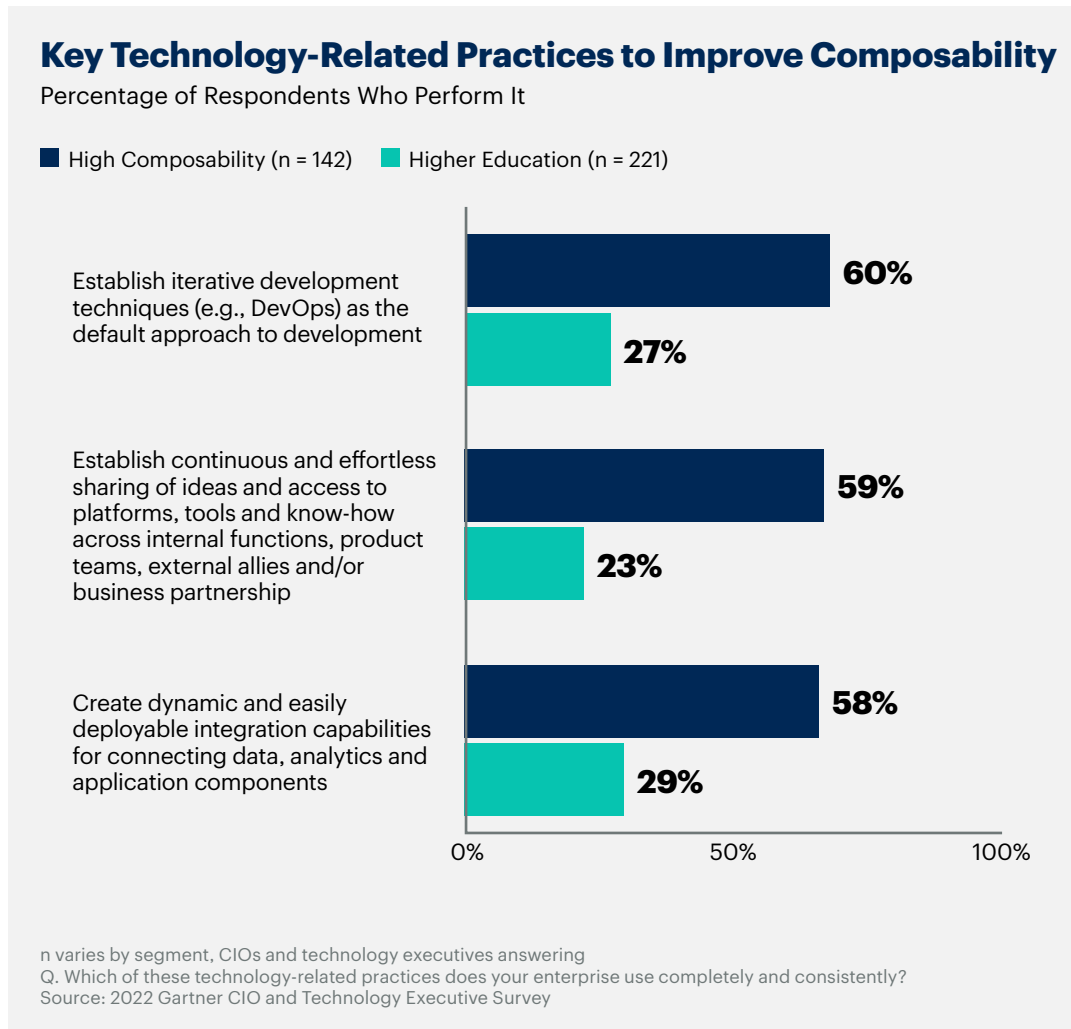
Keywords: Iterative development, sharing and integration.

As noted above, the area of composable technologies is the least pervasive principle overall in higher education (see Figure 4).

Even though these three practices are used more extensively than the top composable thinking practices, the sheer volume and variation of technology and data used in and higher education institutions creates an execution challenge.

A key challenge is to identify the right level of abstraction to create reusable components that are transferable between departments and schools. It is not a lack of understanding of the practices to apply, but an overwhelming variation of situations to apply it to, that resist automation of application of composable technologies.

Figure 10: Key Composable Technology Practices

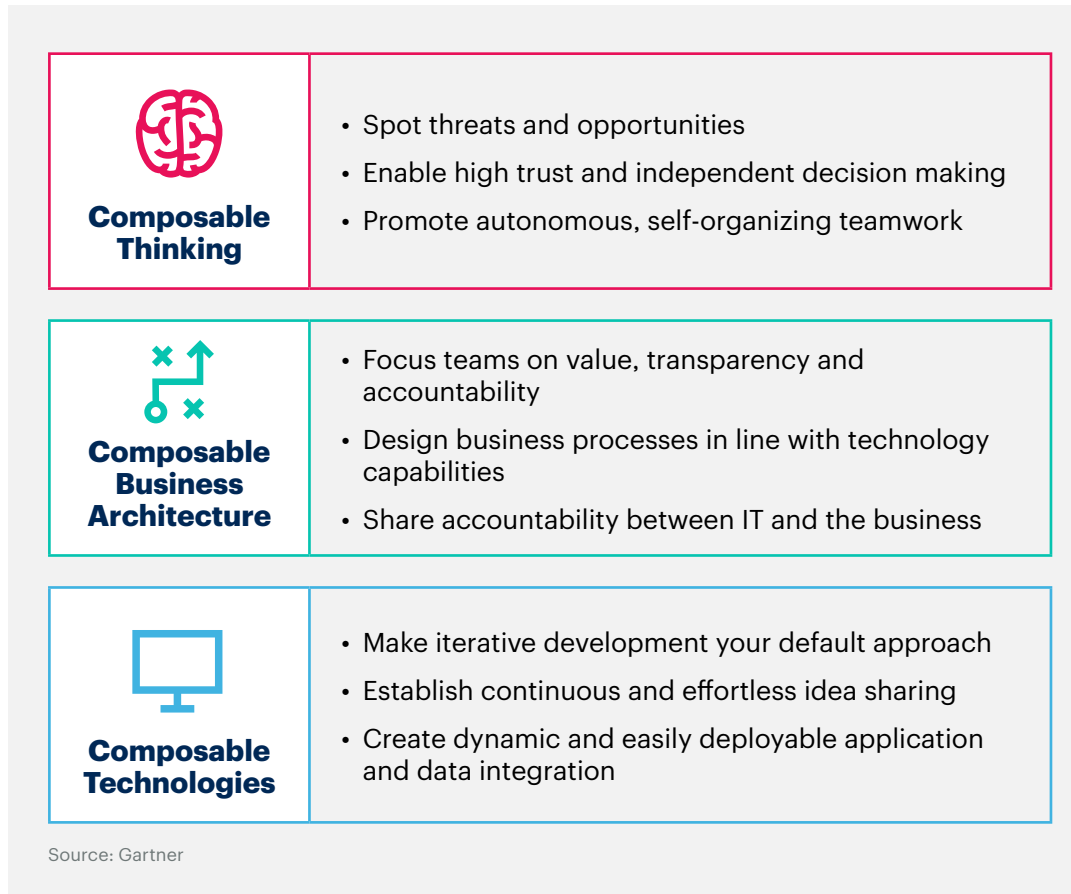


Composability Action Plan

Figure 11 collects all nine practices into an abbreviated action plan that has some key implications for the CIO:

- The three recommendations in composable thinking all require excellent collaboration tools that can be adapted to local needs and creation anywhere. A particular challenge for the CIO will be to provide an identity and access management platform that allows personalized secure services over all the tools teams are expected to adopt.
- The three recommendations in composable business architecture all focus on transparency and accountability among stakeholders across the ecosystem the institution is active in. This requires the CIO to not only leverage technology to connect anywhere, but also reach beyond with technology and design feedback loops that help people act.
- The three recommendations in composable technologies all strive toward friction free innovation by creating more manageable modules. That requires the CIO to identify the **minimum viable components** that improves composability, and recomposability while reducing the risk for technical debt.

Figure 11. Enterprises' Composability Action Plan



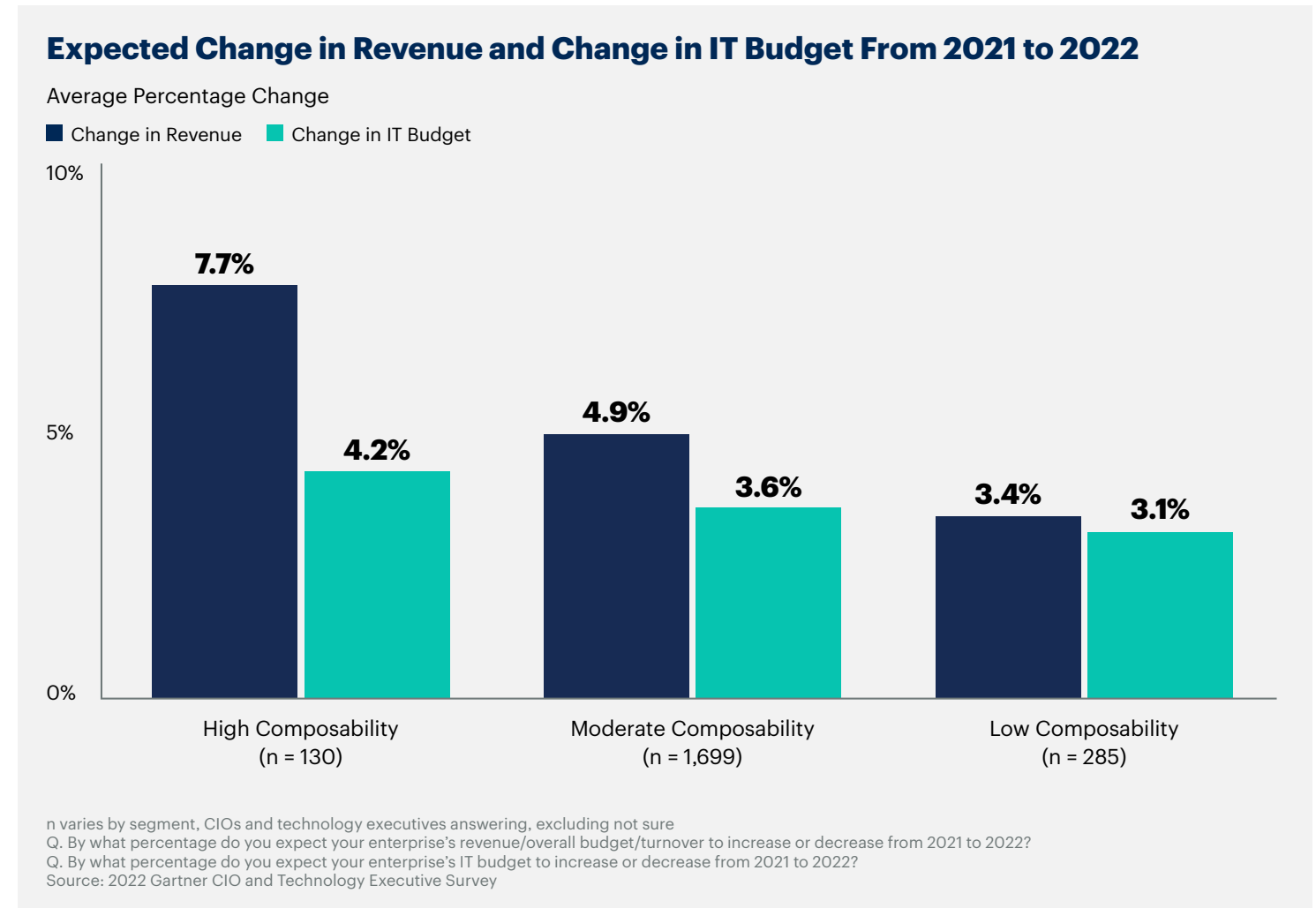
Finally, a key recommendation is: Do more for synergy effects. The survey analysis indicates that it is not enough to be great in individual practices. The key is to implement enough of them to get synergy effects. Note 1 contains all practices tested and we recommend using it for inspiration (see Mobilize Faculty Culture to Accelerate Learning Technology Transformation in Higher Education).

Section 5: 2022 Spending Plans and Technology Trends

The bottom line in many organizations comes down to funding. Even mission-driven organizations such as higher education institutions need a sustainable funding model for all they want to achieve.

Figure 12 shows that there is a clear correlation between the degree of composability and expected budget increases for 2022. This applies both for overall enterprise budgets as well as IT budgets.

Figure 12. High-Composability Enterprises Increase Revenue/Budget Faster and Leverage IT Better



But the funding situation varies widely by industry (see Figure 13). The bad news is that, once again, we find higher education at the bottom of the list for expected total budget change (+0.3% on average). The good news for the higher education CIO is that the IT budget is expected to increase considerably more than the total budget (+2.7% on average), indicating a continued shift toward more IT spending.

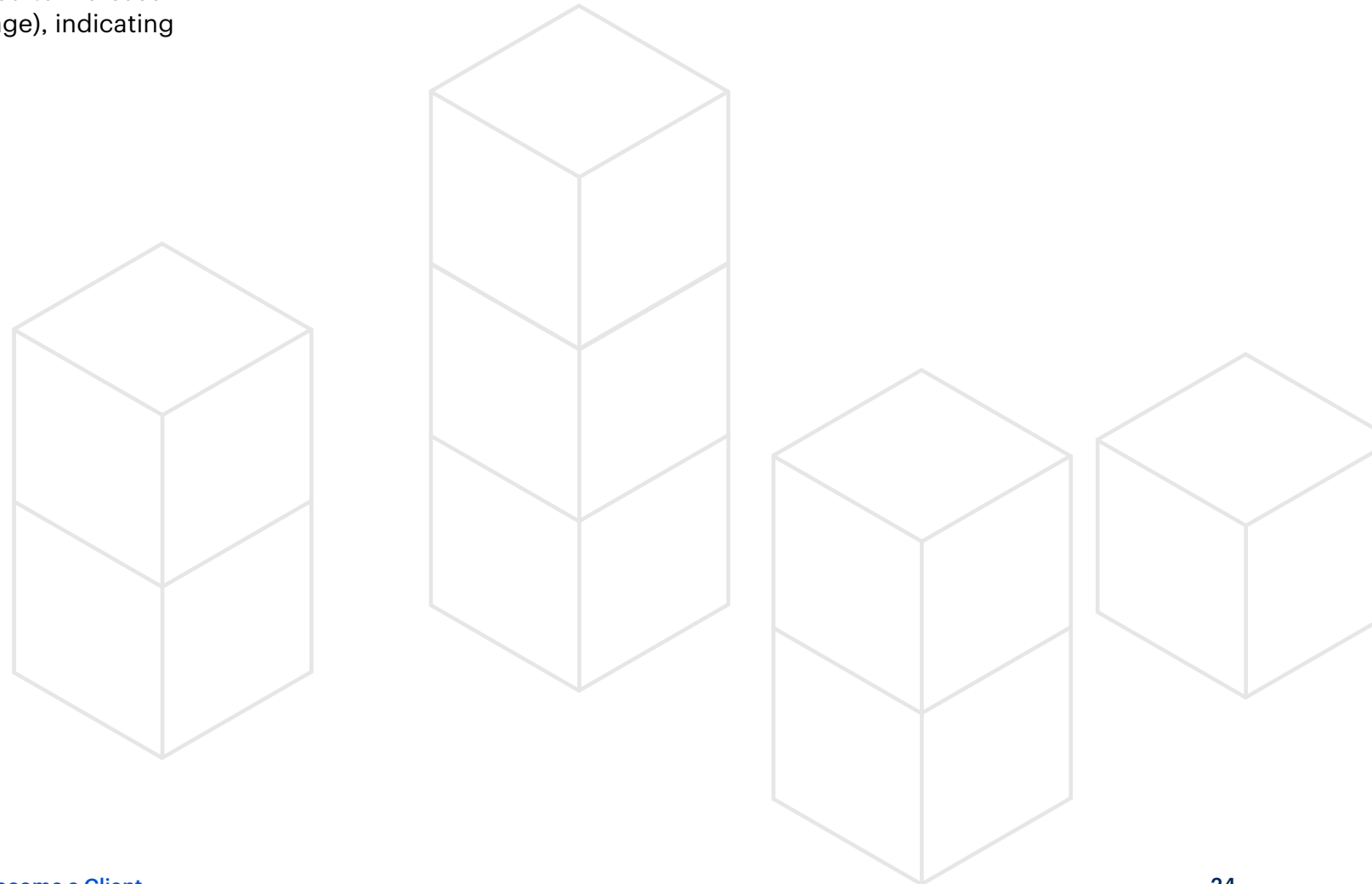
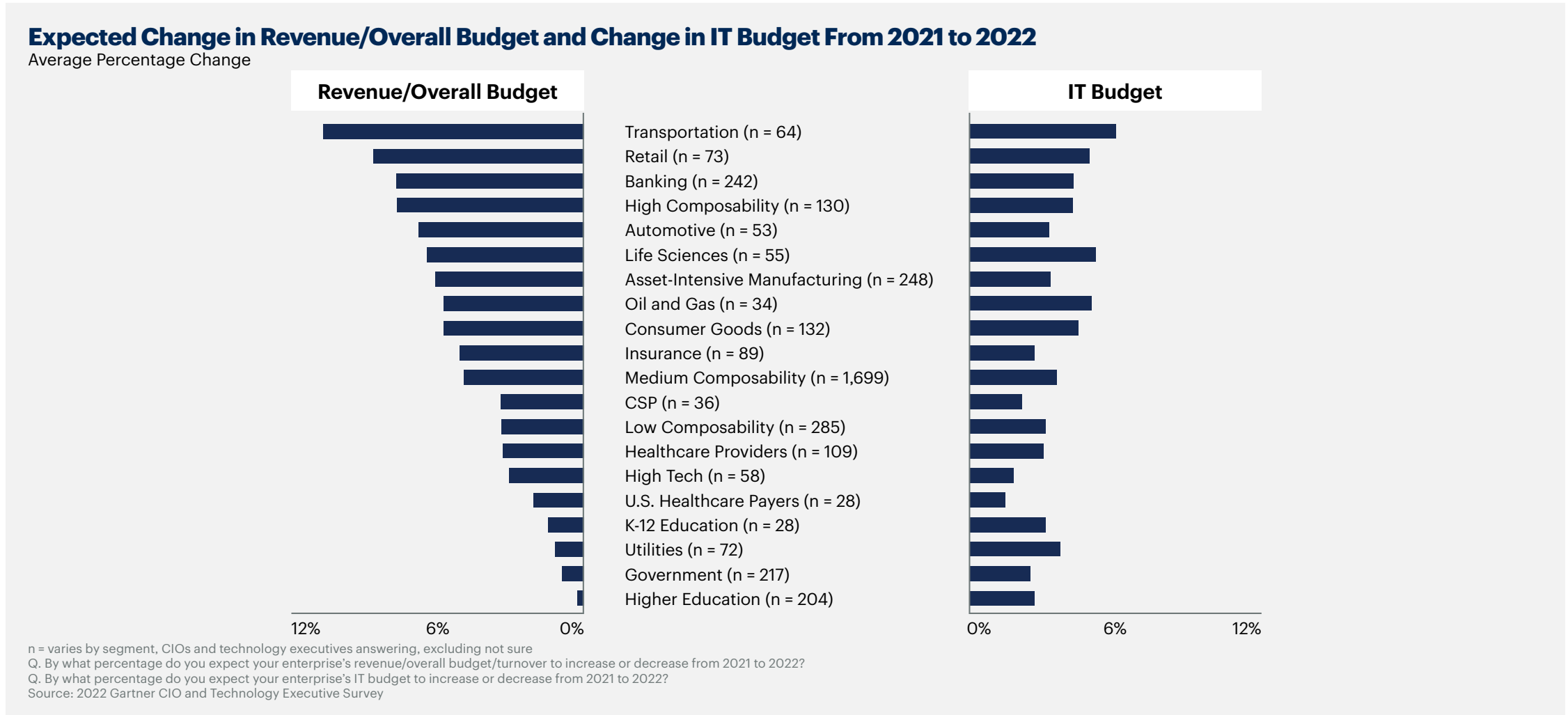


Figure 13. Budget Changes for 2022 Will Vary Widely by Industry

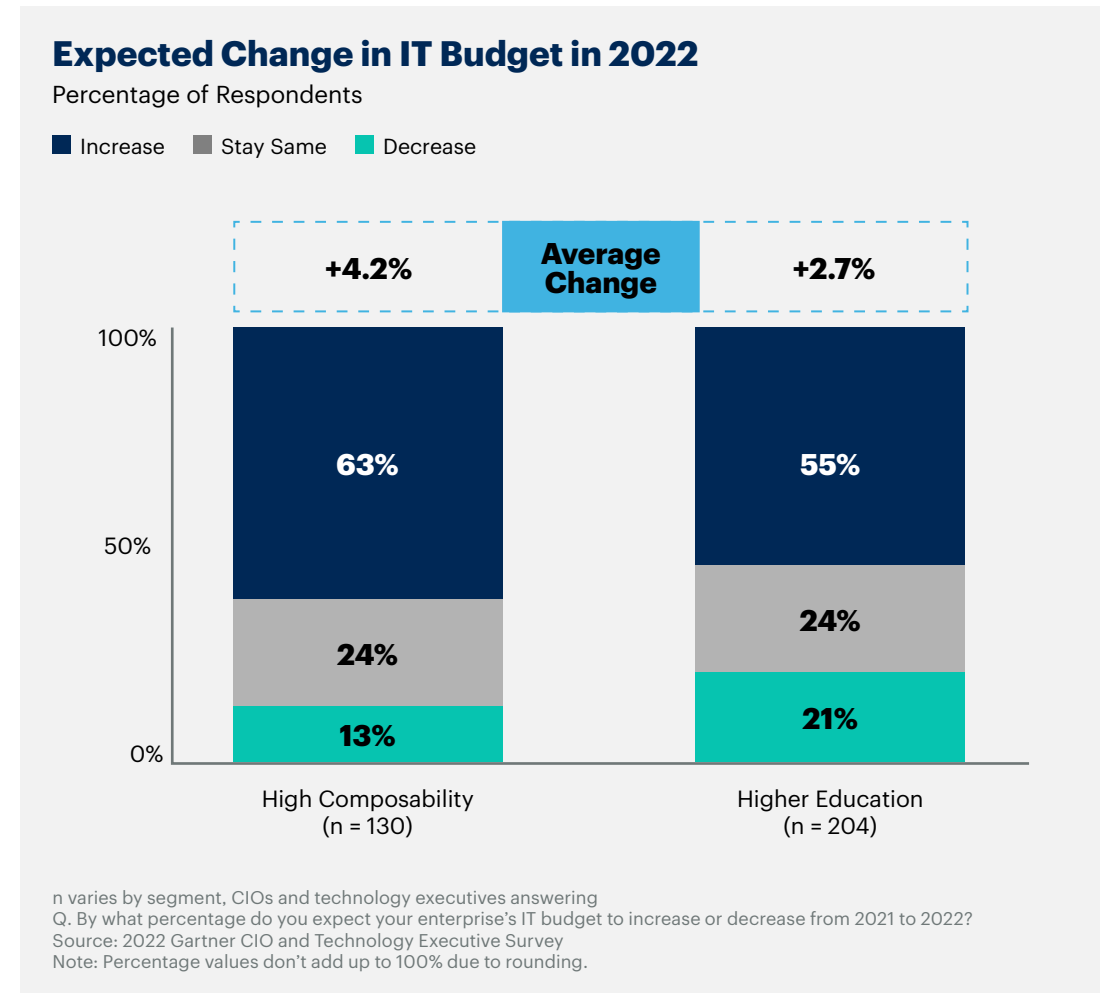


It is important to bear in mind that these numbers are averages. As Figure 14 show:

- 55% of higher education respondents expect an increase in budget.
- 24% expect staying the same.
- 21% expect a decrease.

Even among the highly composable enterprises, there is variation with 13% actually expecting a decrease in the IT budget.

Figure 14. High-Composability Enterprises Plan, on Average, a 4.2% Increase in 2022 IT Spending



So, how do higher education CIOs use their budgets? One trend is consistent: They continue to rebalance their technology portfolios toward the cloud (see Figure 15). The technology area where most respondents expect to reduce funding is legacy infrastructure and data center technologies, while cloud platforms ranks second as the area for increased investment.

This year, increasing cybersecurity investments is more popular than other technology investments by a wide margin. This is to be expected, as a continued march toward ever more digital, not the least in the workplace, requires more security measures. Other evidence for increased dependence on IT is that 34% of the respondents do not expect to reduce spending anywhere — but they do plan to add. Best case, this is a sign that IT is gaining in importance, but it could also spell problems for CIOs long term, as they are likely building technical debt.

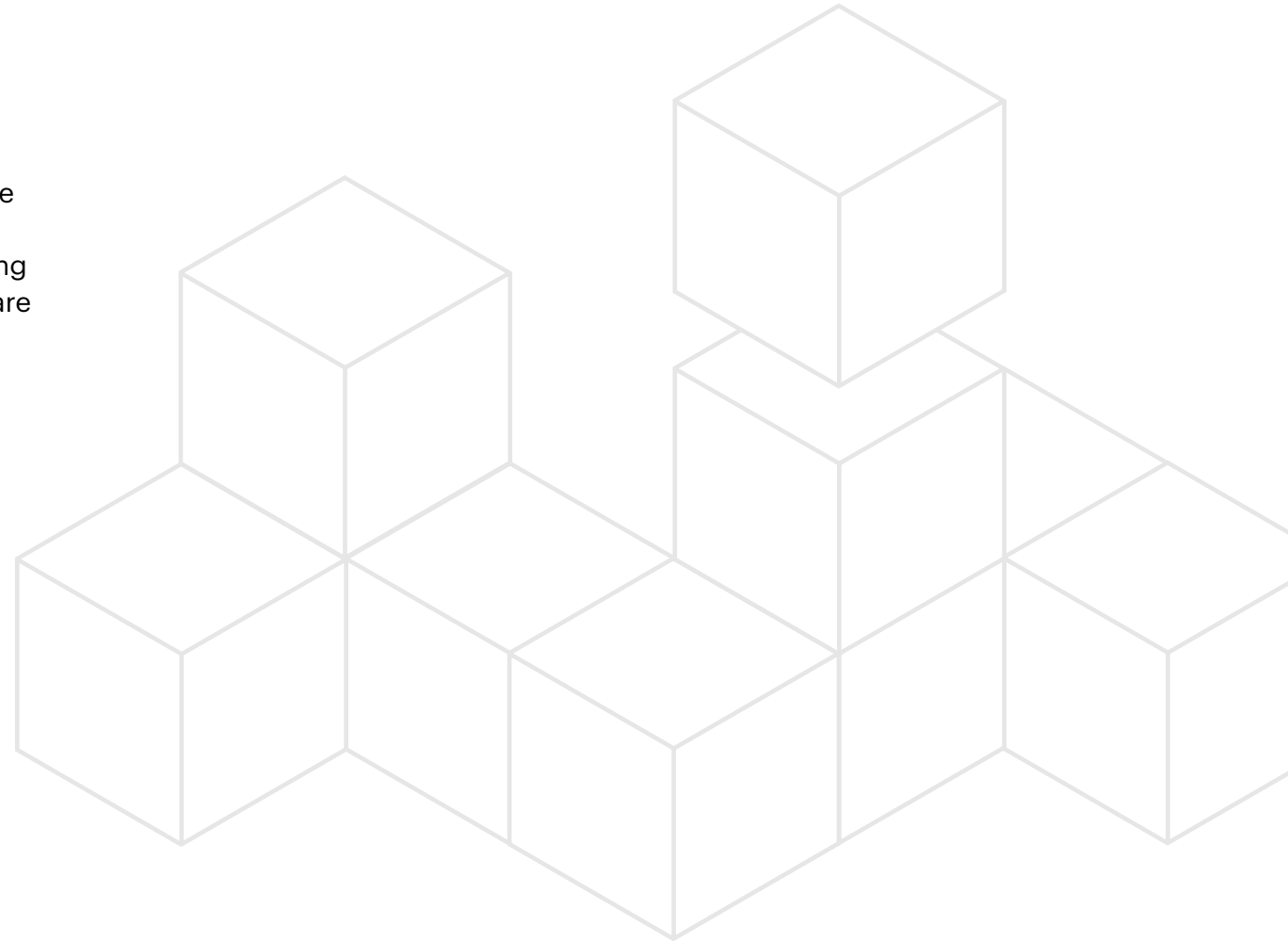
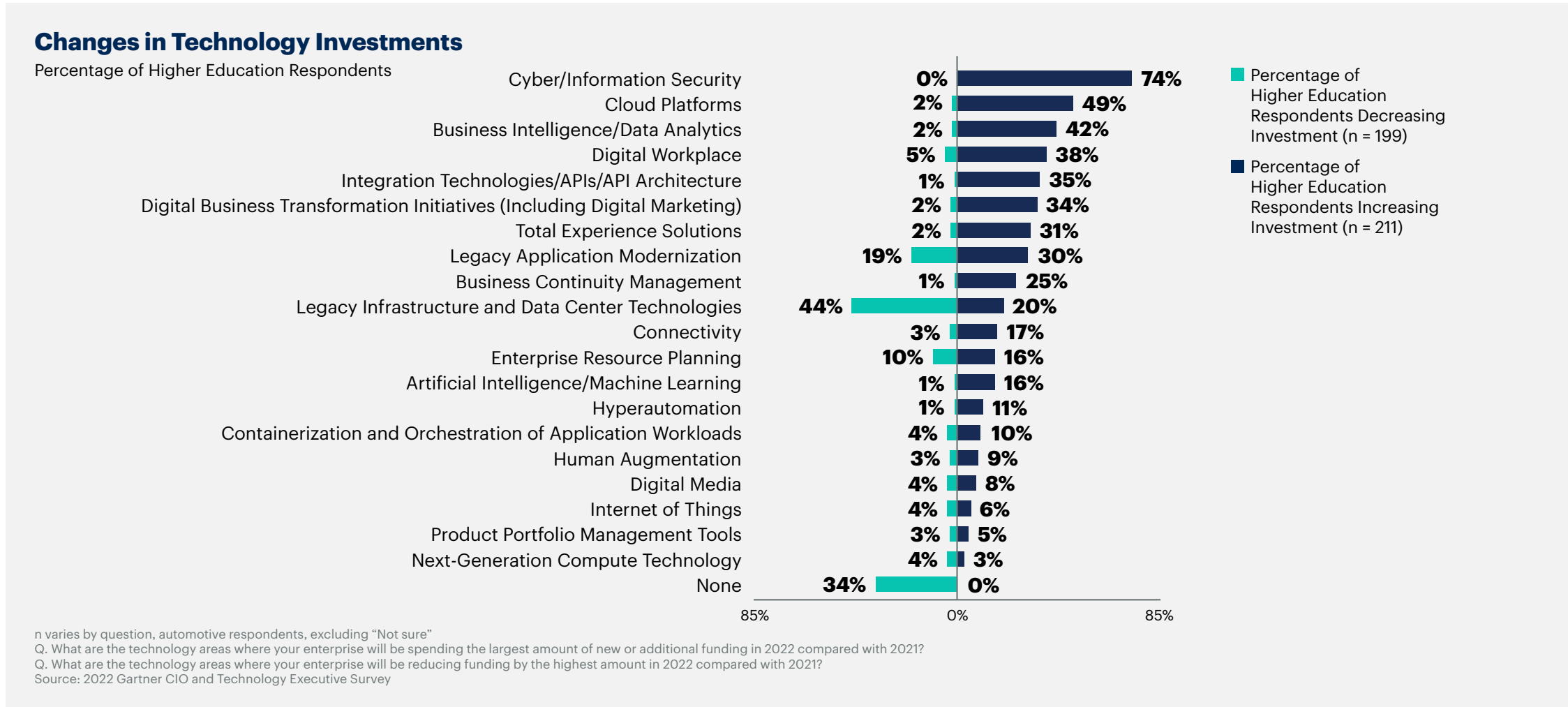
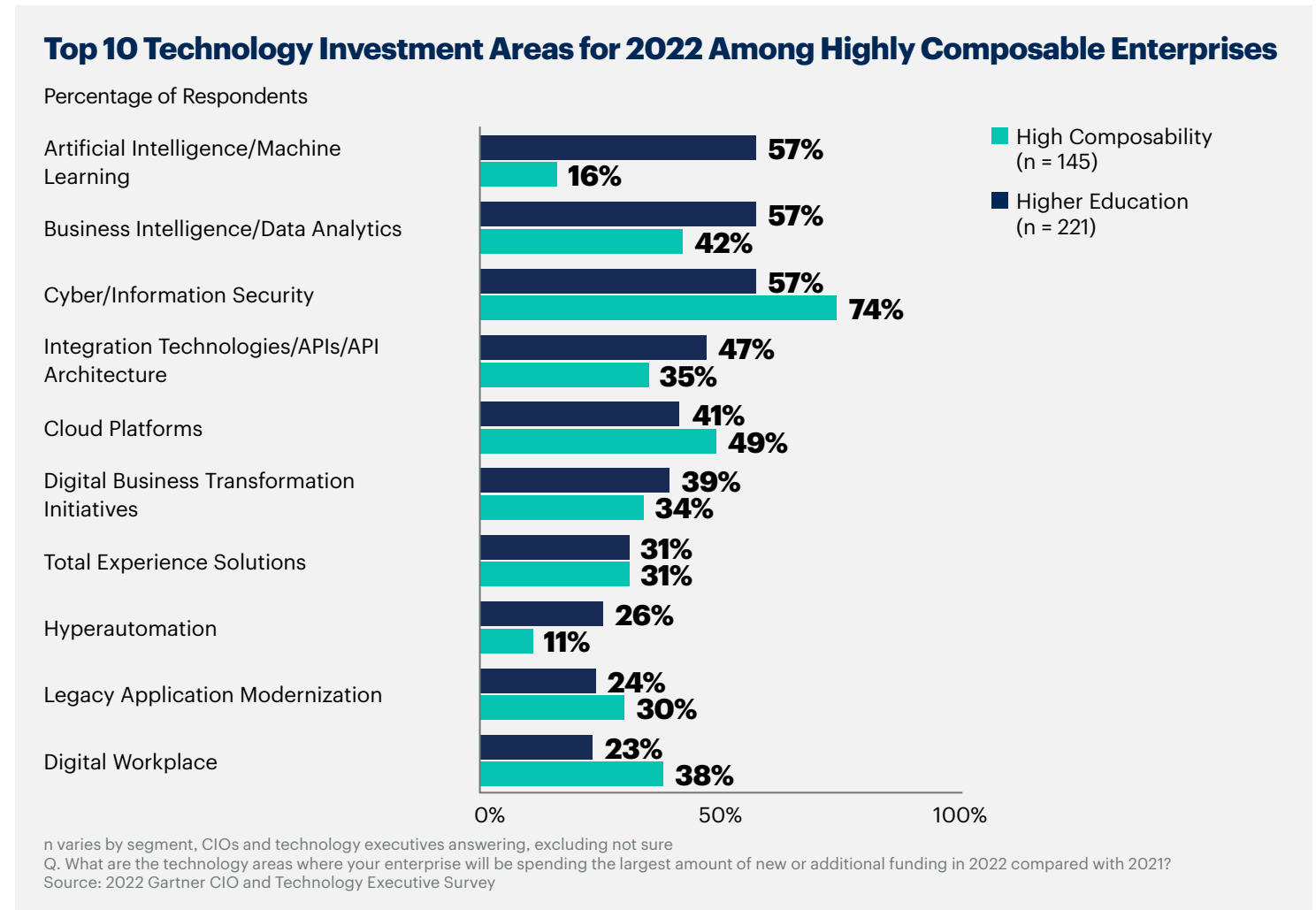


Figure 15: Enterprises Will Rebalance Their Technology Portfolios



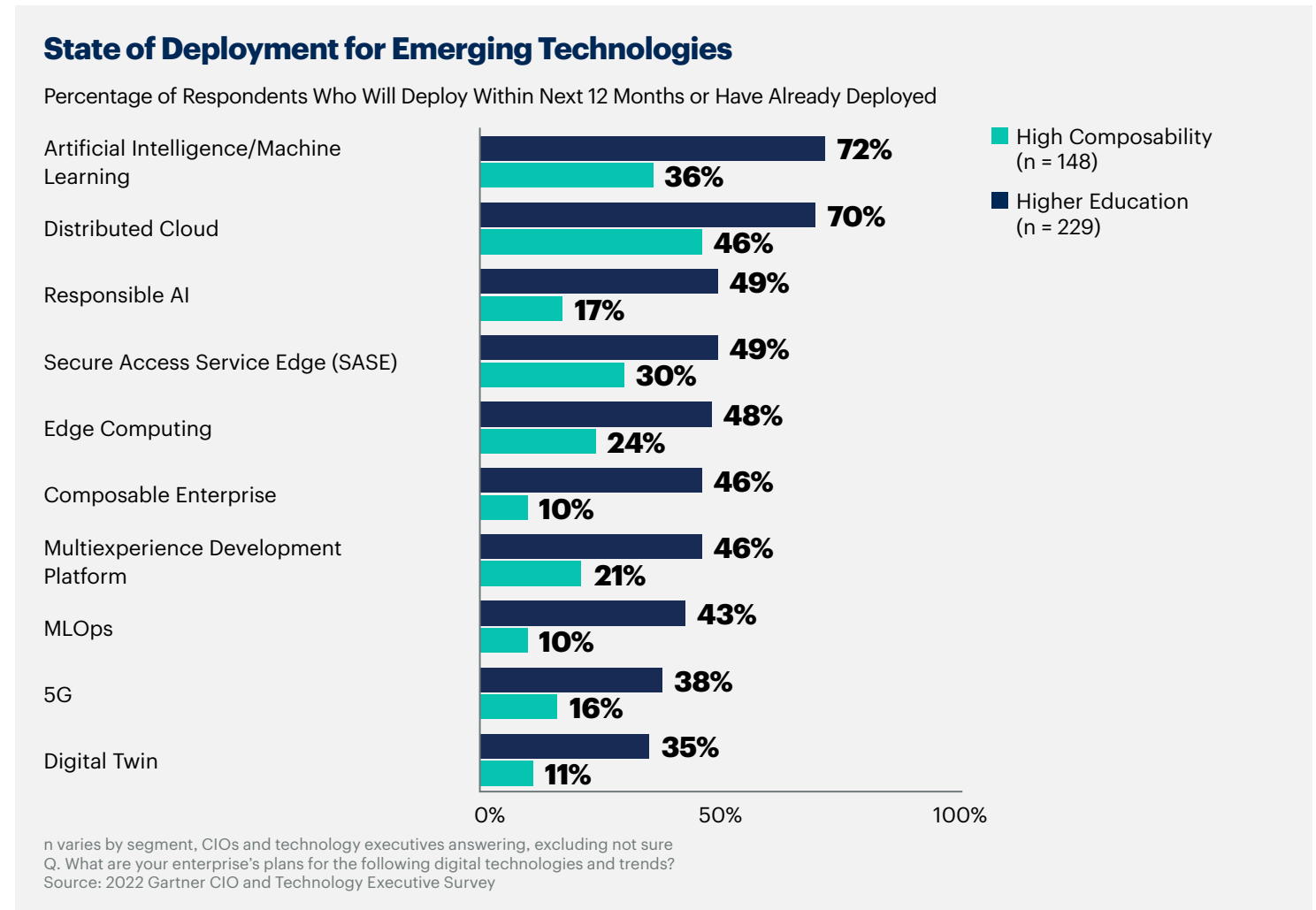
It is worth noting that the top 10 list of increased spending for highly composable enterprises differs a bit from that of higher education respondents (see Figure 16). For example, artificial intelligence (AI) tops the list for highly composable enterprises, but stands at No. 12 for higher education. More importantly, the investment profile seems a bit more balanced, with the top three at the same respondent rate.

Figure 16. High-Composability Enterprises' 2022 Investment Priorities



When we look at implementation behavior for emerging technologies, we can also see that highly composable enterprises are more aggressive in their deployment than higher education respondents (see Figure 17). This indicates that being a highly composable enterprise also means an appetite for testing technology early.

Figure 17. Composable Enterprises' 2022 Activities Around Emerging Technologies



Section 6: Industry-Specific Software

Technology dependence is not just about general emerging technology or infrastructure. All industries have specific software that carries weight for enterprise operation. In higher education, that list continues to increase as software matures and becomes established as tools in everyday operation. Figure 18 lists the most common software in higher education today, together with some emerging software with specific relevance for higher education.

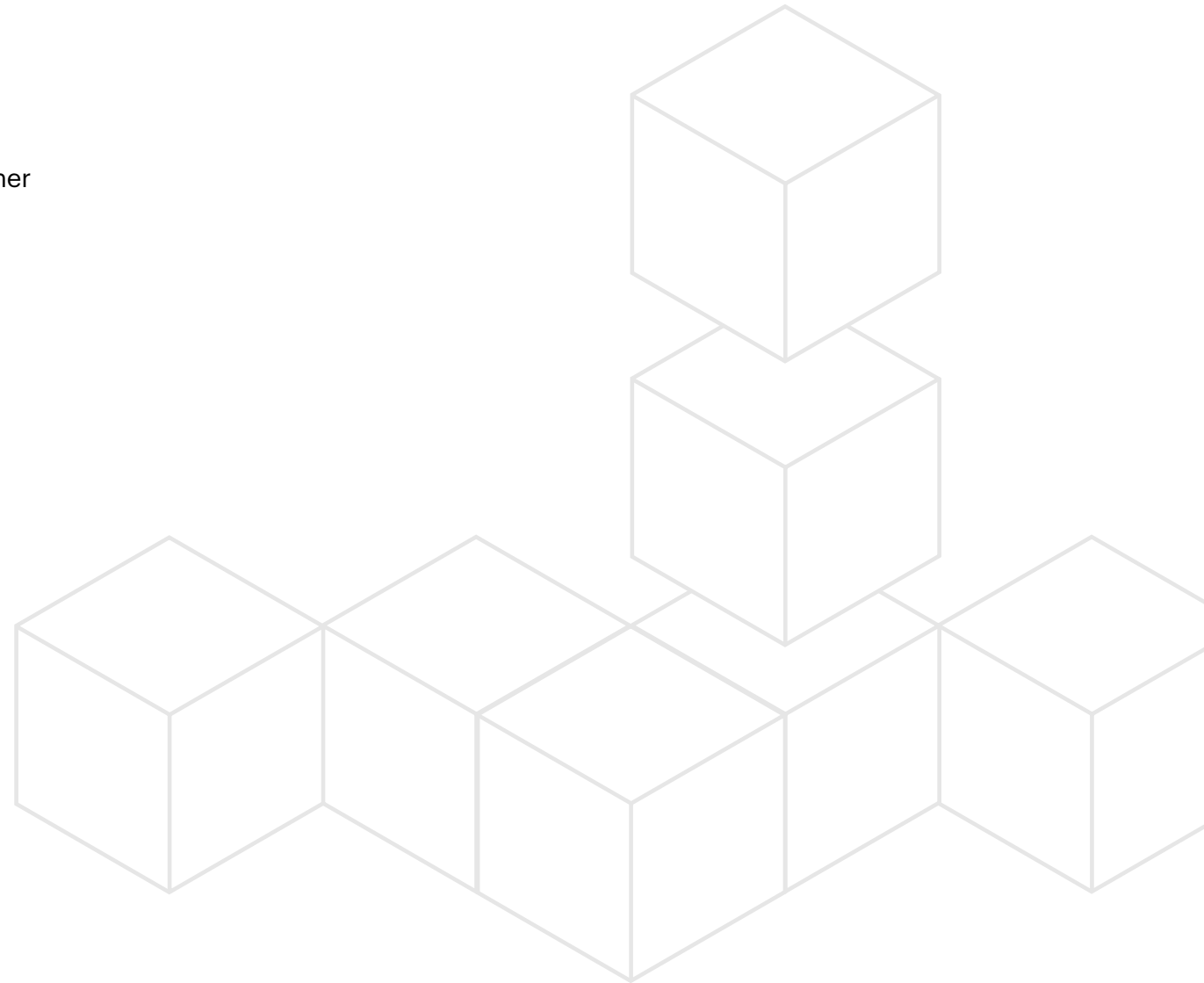
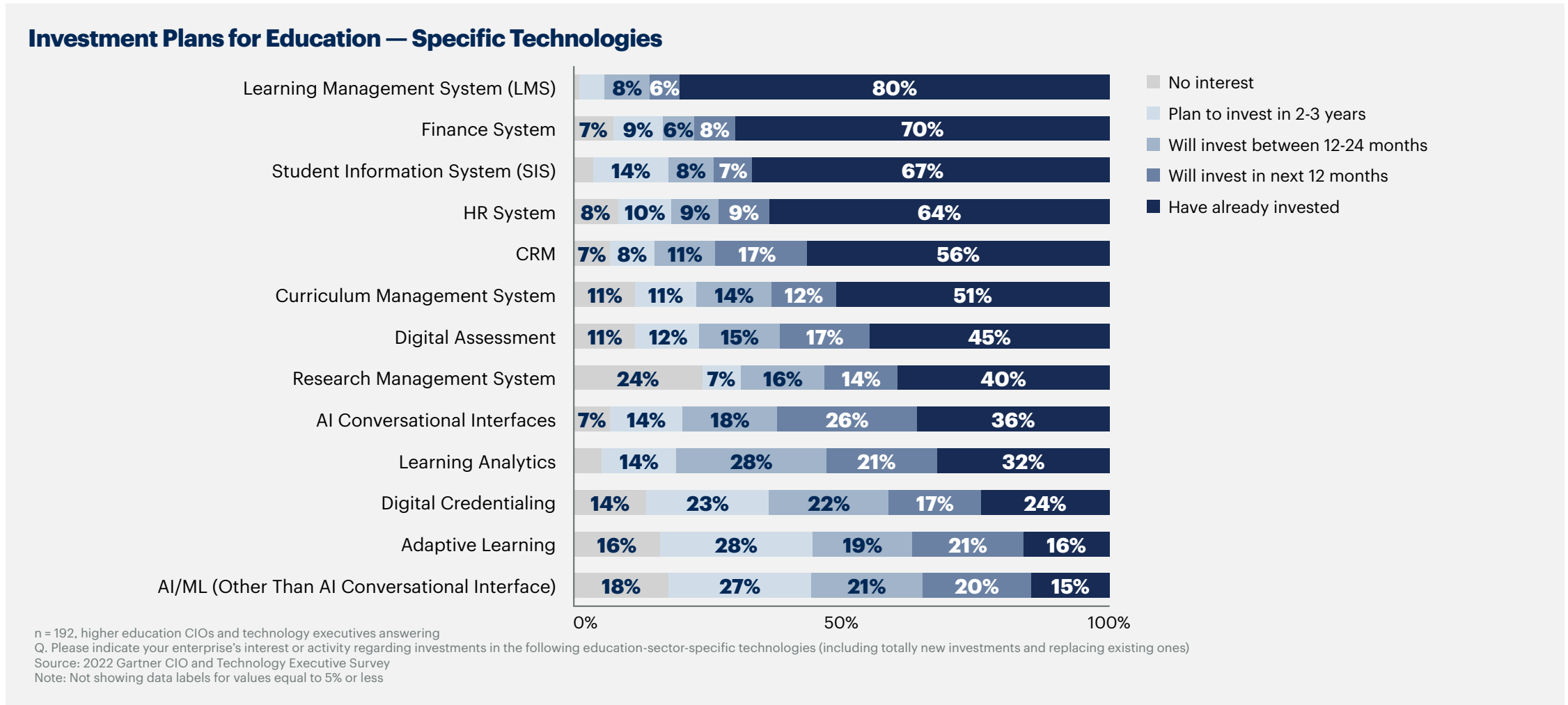


Figure 18. Technology Investment Plans for Higher Education



Most noteworthy is the cyclical nature of even the most established software, such as:

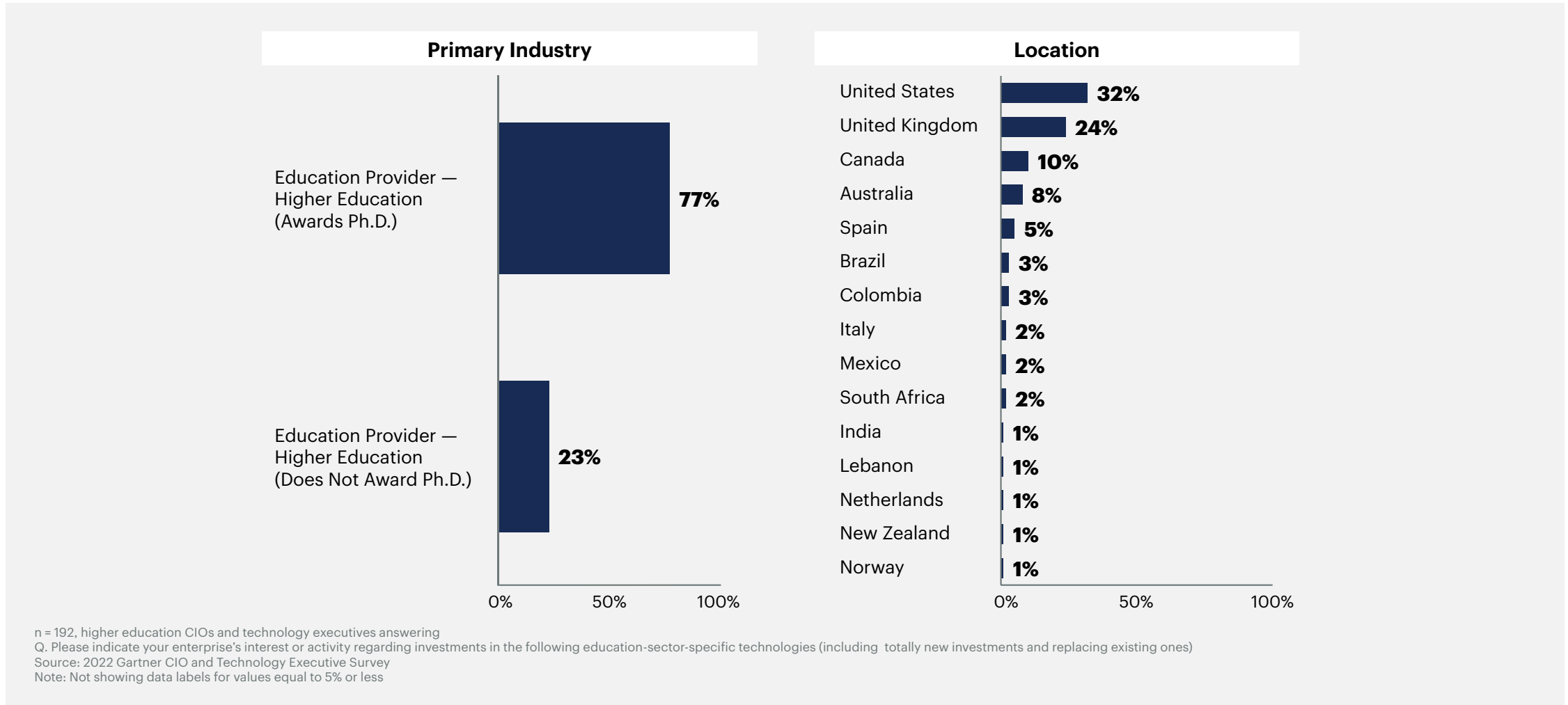
- Learning management systems (LMS)
- Student information systems (SIS)
- Finance
- Human resources

Some education-specific software (such as digital assessment and digital credentials) continue to increase in adoption, while others (such as learning analytics and adaptive learning) seem to have stalled. The reasons for variation are many, but the implication for the CIO is that it is important to plan the overall life cycle of software as there is opportunity cost to everything, even upgrading a finance system.

Section 7: Higher Education Demographics and Survey Methodology

Thanks to help from EDUCAUSE, the Universities and Colleges Information Systems Association (UCISA) and Council of Australasian University Directors of Information Technology (CAUDIT), we have a healthy set of respondents to this year's survey. We appreciate and look forward to expanding on the collaboration. Figure 19 shows the distribution of respondents by country and by type of higher education institution, "awarding Ph.D." or not. The latter is a proxy for judging research intensity in an institution.

Figure 19. Survey Demographics



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