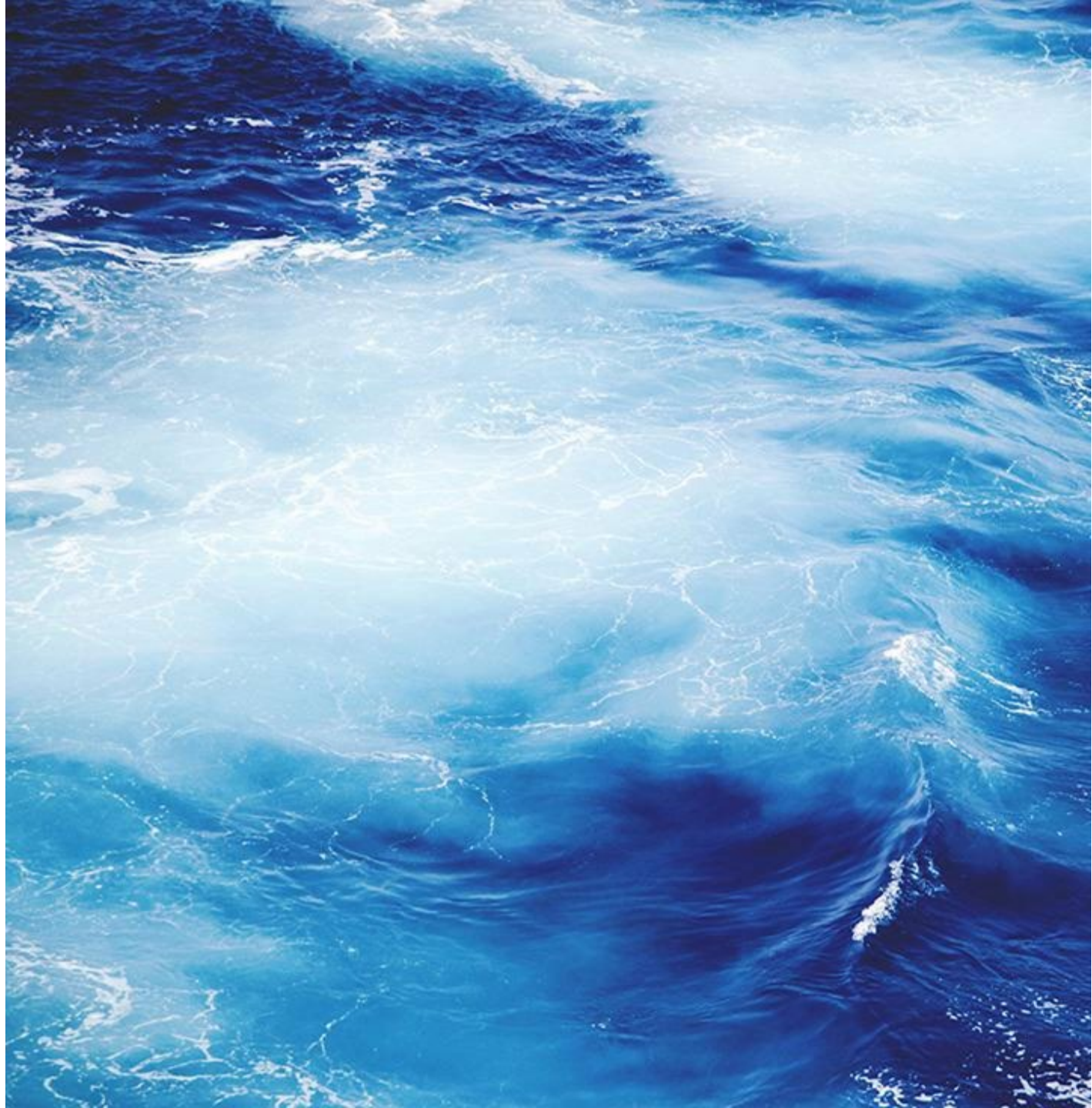
Battery

March 2023

State of Cloud Software Spending



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The information contained herein is based solely on the opinions of Scott Goering, Danel Dayan, Evan Witte and Patrick Hsu and nothing should be construed as investment advice. The anecdotal examples throughout are intended for an audience of entrepreneurs in their attempt to build cloud-focused businesses and not recommendations or endorsements of any particular business.

Enterprise Tech Spend Sentiment Index

The Battery Ventures Enterprise Tech Spend Sentiment Index is a score between 0 and 100, based on budget, spending trends, budget outlook (data, security, AI/ML, dev tools, etc.) and approval times.

An Index score over 50 signals bullish buyer behavior, with enterprise buyers still active and driving adoption of new technologies. An Index score below 50 signals bearish buyer behavior with a more conservative outlook.

We saw a 5.2-point decrease from September's Index score of 55.4, a modest drop that can be attributed to cooling technology markets and increased budget oversight.

55.4
Q3 2022

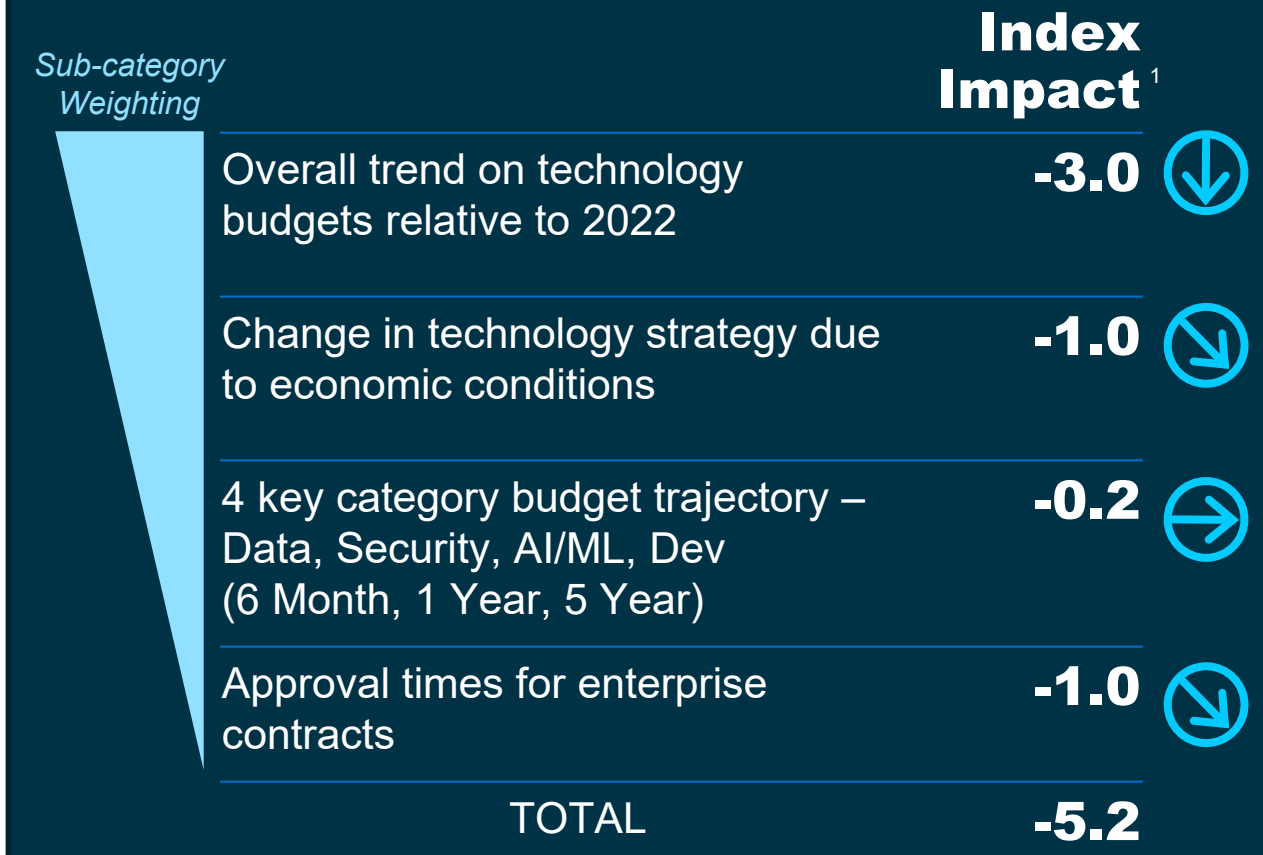
50.2
Q1 2023

This score suggests moderately bullish behavior from enterprise tech buyers, who are expanding their tech stacks but approaching contracts with more conservatism.

What's Driving Sentiment Index

The Enterprise Tech Spend Sentiment Index dropped 5.2 points between Q3 2022 and Q1 2023, likely due to a confluence of factors, including:

- **More companies compressing budgets**, but no significant increase in companies decreasing spend by over 10%.
- **More conservatism in technology strategy**, given economic unpredictability (9% change from Q3 2022).
- A **strong 1-year and 5-year outlook on budgets** across data, AI/ML, security and dev tools, despite a paring back in some categories, including dev tools.
- **Slowed approval times for companies**, as enterprises become more diligent on technologies they adopt, particularly those that create dramatic organizational change.



Note 1: Relative to Battery Q3 2022 Cloud Software Spending Survey

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Demographics and Macro Trends

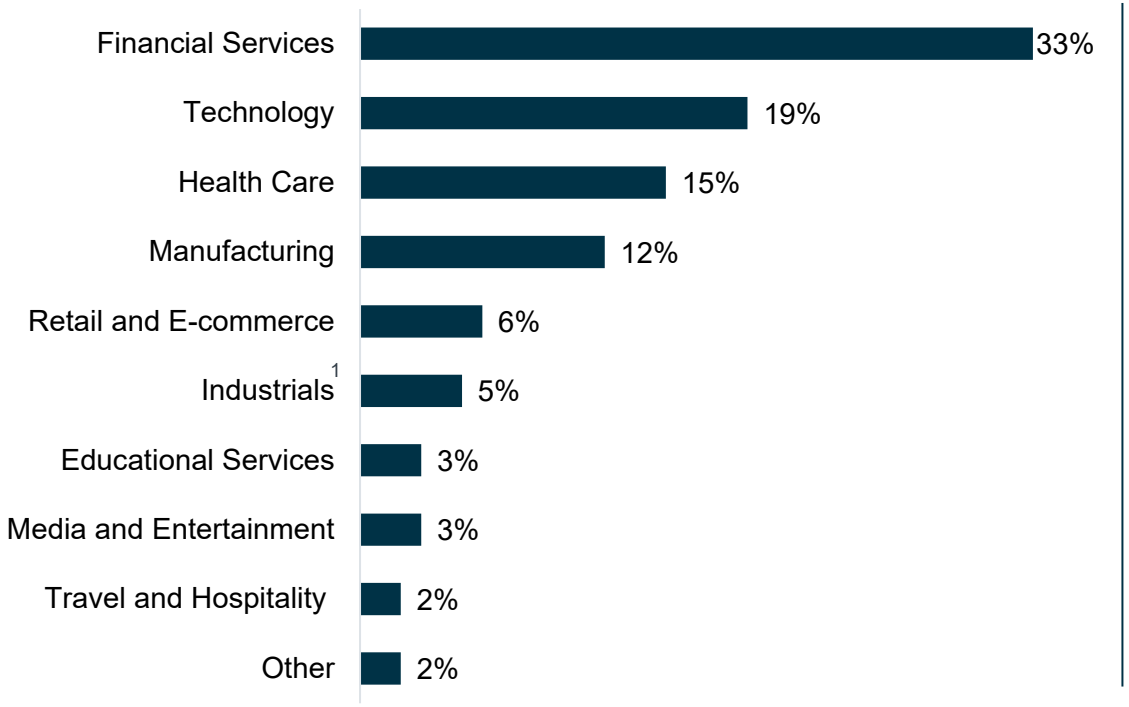
Cloud Software Spending is Not Immune, But It is Resilient

1. Enterprise tech outlook is more optimistic than recent headlines might suggest
2. Enterprise technology budgets remain relatively inelastic, despite increased oversight
3. Bottoms-up and PLG will experience headwinds as buyers become more conservative
4. While overall hiring has slowed, there is still robust demand for key technical roles
5. Spending slowdown is short-term; mid-term and long-term spending demand remains intact
6. CSP marketplaces are growing and becoming a meaningful potential GTM channel
7. Generative AI is getting buzz, but very limited operational traction within enterprises to date

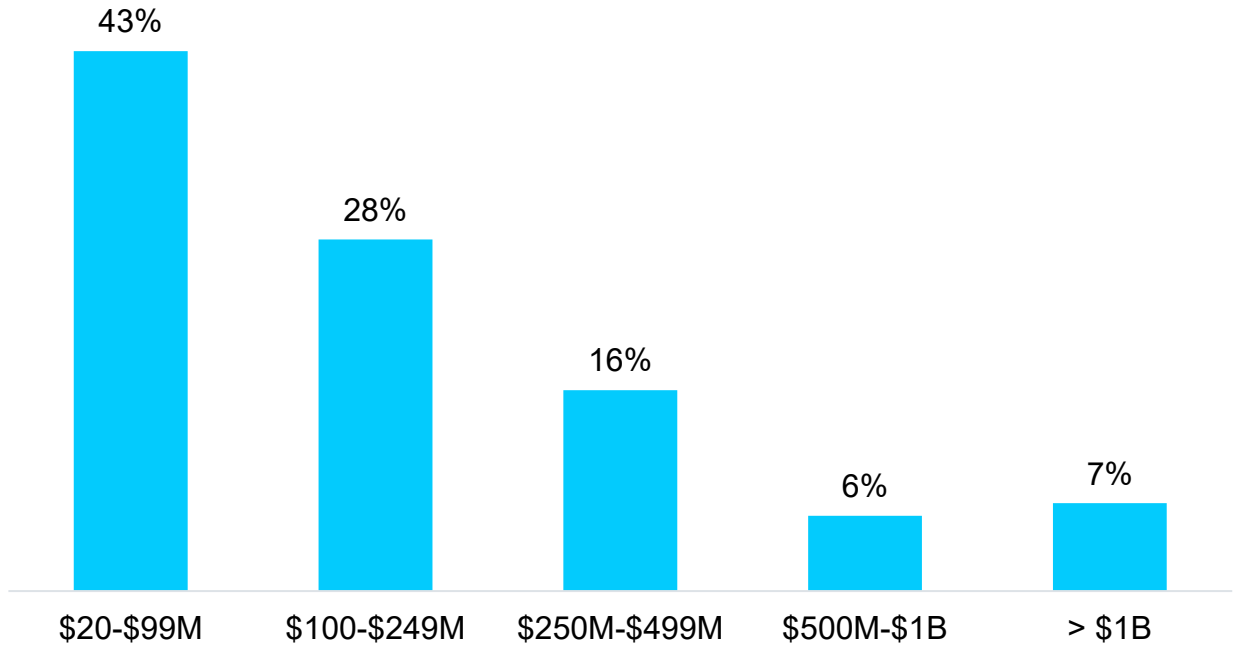
Cloud Software Spending Survey Composition

- Battery's Cloud Software Spending Survey saw participation from **100 CXOs representing ~$30B in annual technology spend.**
- **58%** of respondents **spend $100M+ on cloud infrastructure, application software, data platforms and ML tooling.**
- **85%** of respondents are from **companies with 1,000+ FTEs** across financial services, tech, health care and manufacturing.

Industry Representation

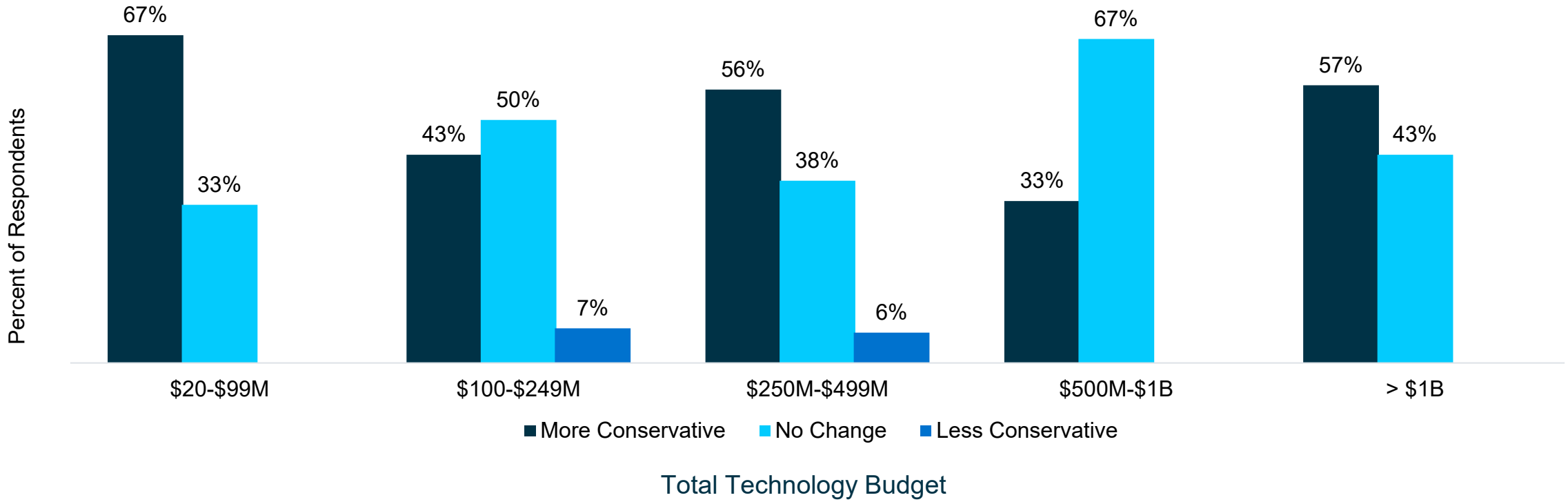


Budget Distribution: Total Technology Spend Per Company [2]



Source: Battery Q1 2023 Cloud Software Spending Survey
Note 1: Industrial segment includes aviation, construction, utilities, transportation and warehousing.
Note 2: Annual technology spend calculated based on mid-point of total technology budget.

Impact of Economic Conditions on Technology Spending Strategy

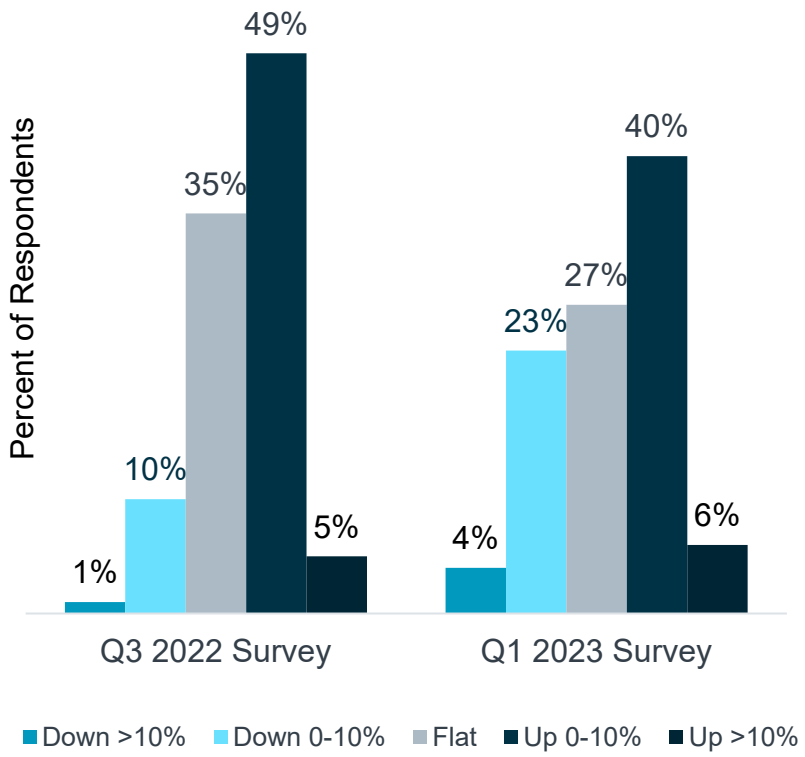


Continued conservatism in tech spending strategies due to macro headwinds; 56% of CXOs are tempering spending expectations, up from 51% in Q3 2022 survey.

Source: Battery Q1 2023 Cloud Software Spending Survey

Technology Budget and Spending Trends

CXO Budget Plans 2022 vs. 2023



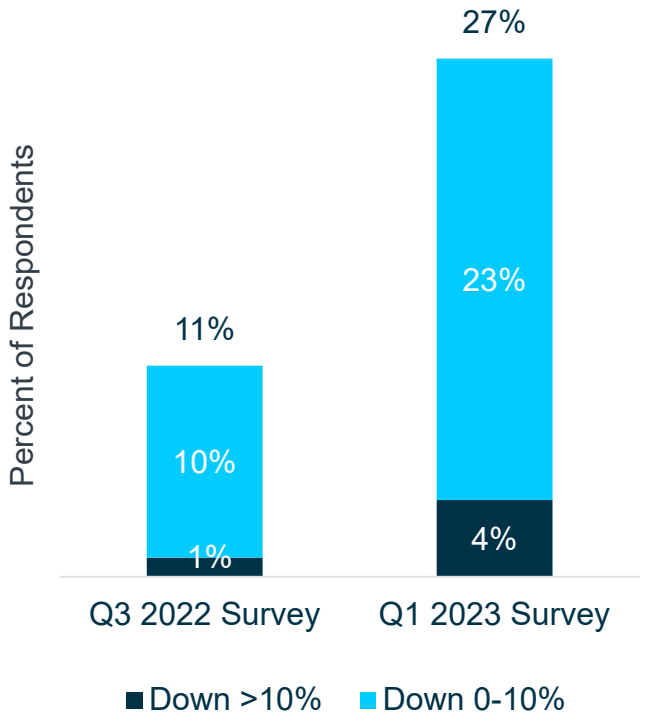
Budget Distribution: Total Technology Spend per Company

1. Strong budgets for those with over $500M in annual spend – 46% of budgets are increasing, 31% are remaining flat and 23% are down.
2. 78% of CXOs cite renewals as the cause of their decrease in technology budget, suggesting that buyers are evaluating and constricting vendors.
3. Although technology strategy is overall more conservative, 65% of CXOs cite experimental budget for increase, revealing a willingness for new solutions.
4. Budgets remain relatively inelastic: 46% of CXO respondents expect to increase their total technology budget for 2023, despite continued macro headwinds.

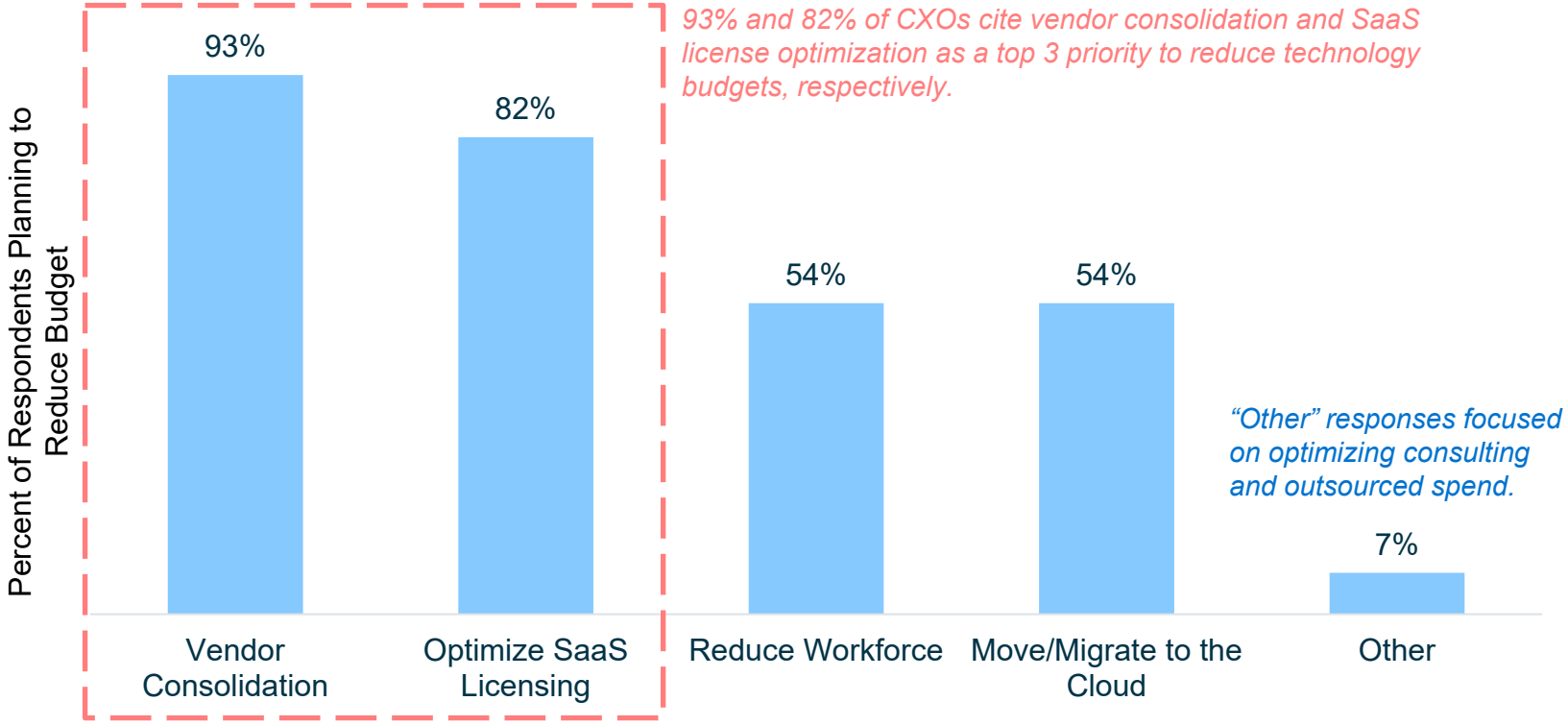
Source: Battery Q1 2023 Cloud Software Spending Survey

Top Priorities for CXOs Planning to Reduce Budget

CXOs Planning to Reduce Budget



Top 3 Priorities for Reducing Technology Budget for CXOs



93% and 82% of CXOs cite vendor consolidation and SaaS license optimization as a top 3 priority to reduce technology budgets, respectively.

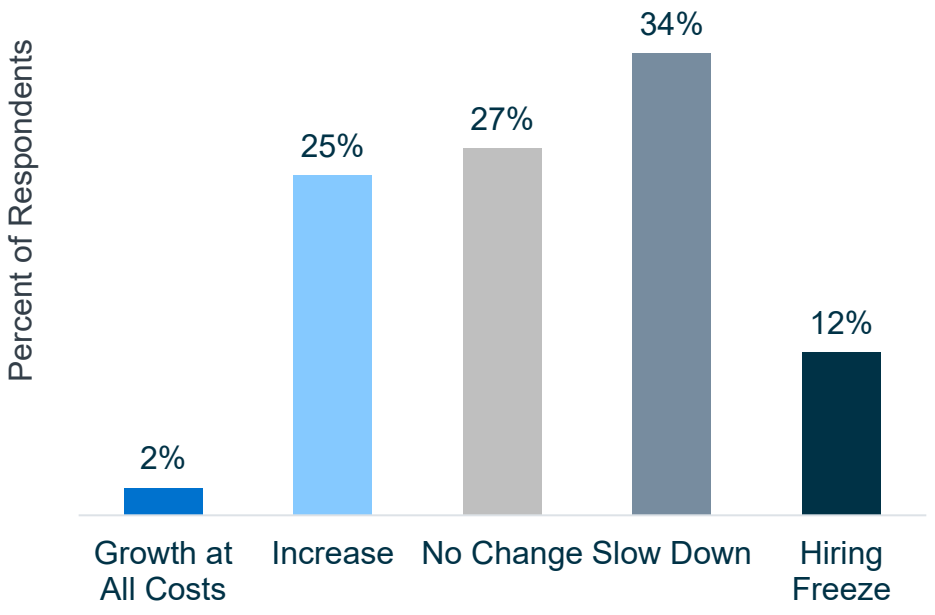
"Other" responses focused on optimizing consulting and outsourced spend.

Saw a 16-point increase in the percentage of CXO respondents planning to reduce 2023 budgets compared to our Q3 2022 survey; most focused on vendor consolidation and optimizing SaaS licenses.

Source: Battery Q1 2023 Cloud Software Spending Survey

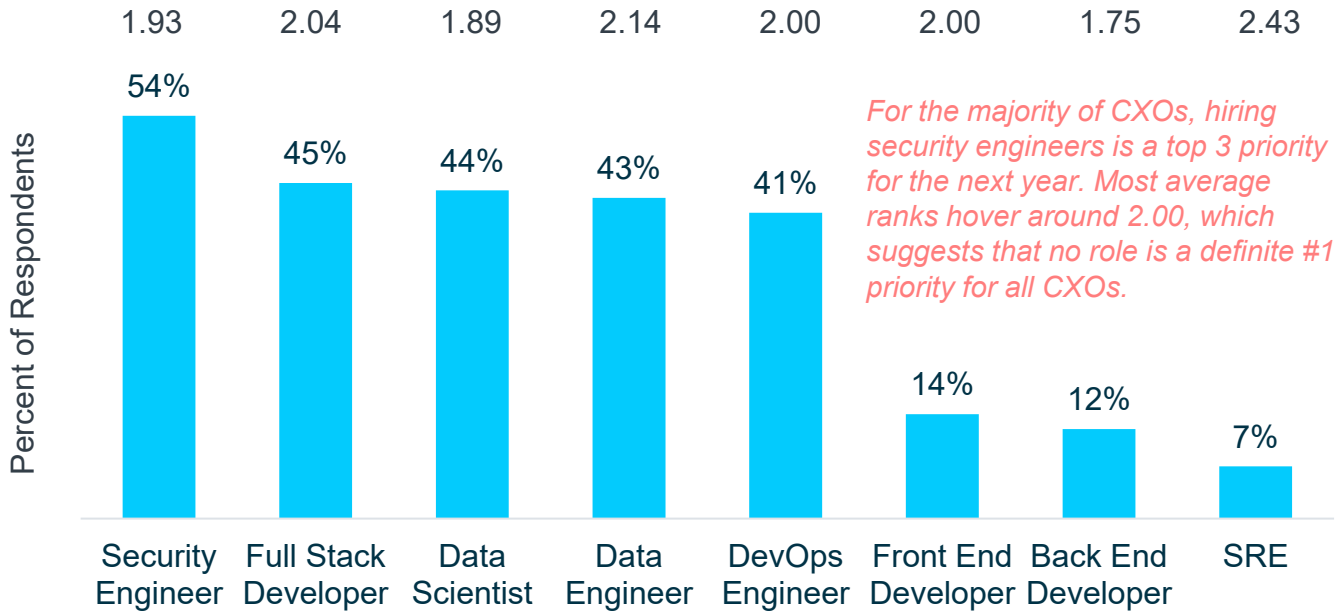
Headcount Plan and Hiring Focus for CXOs

Plans for Headcount



Top 3 Priority Roles CXOs Are Hiring For

Average Rank (out of 3):
Ranking system where 1 is the company's top priority



For the majority of CXOs, hiring security engineers is a top 3 priority for the next year. Most average ranks hover around 2.00, which suggests that no role is a definite #1 priority for all CXOs.

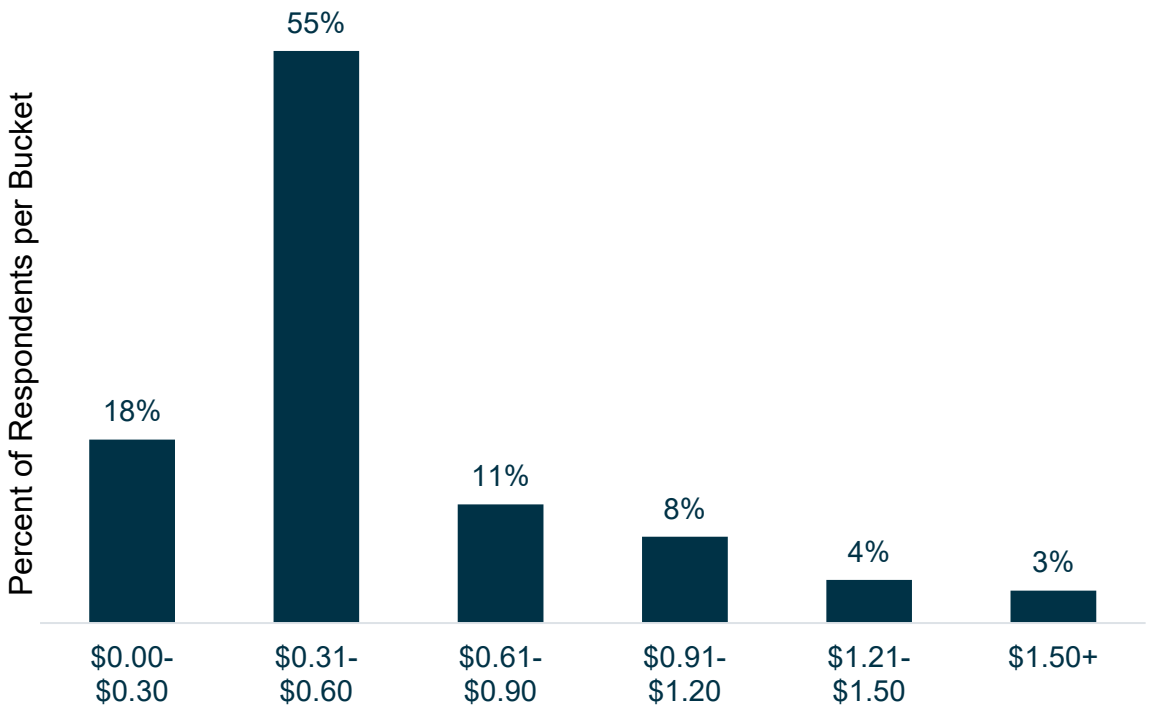
The tech hiring market is seeing headwinds going in 2023; 46% of CXOs expect a headcount slow down. For those who are hiring, security, full stack and data roles continues to be top hiring priorities.

Source: Battery Q1 2023 Cloud Software Spending Survey

Tech Headcount vs. Tools: A Spend Comparison

For Example: $X in Tech Budget for Each $1 in Tech Headcount

Technology Organization Headcount Spend vs. Technology Tool Budget



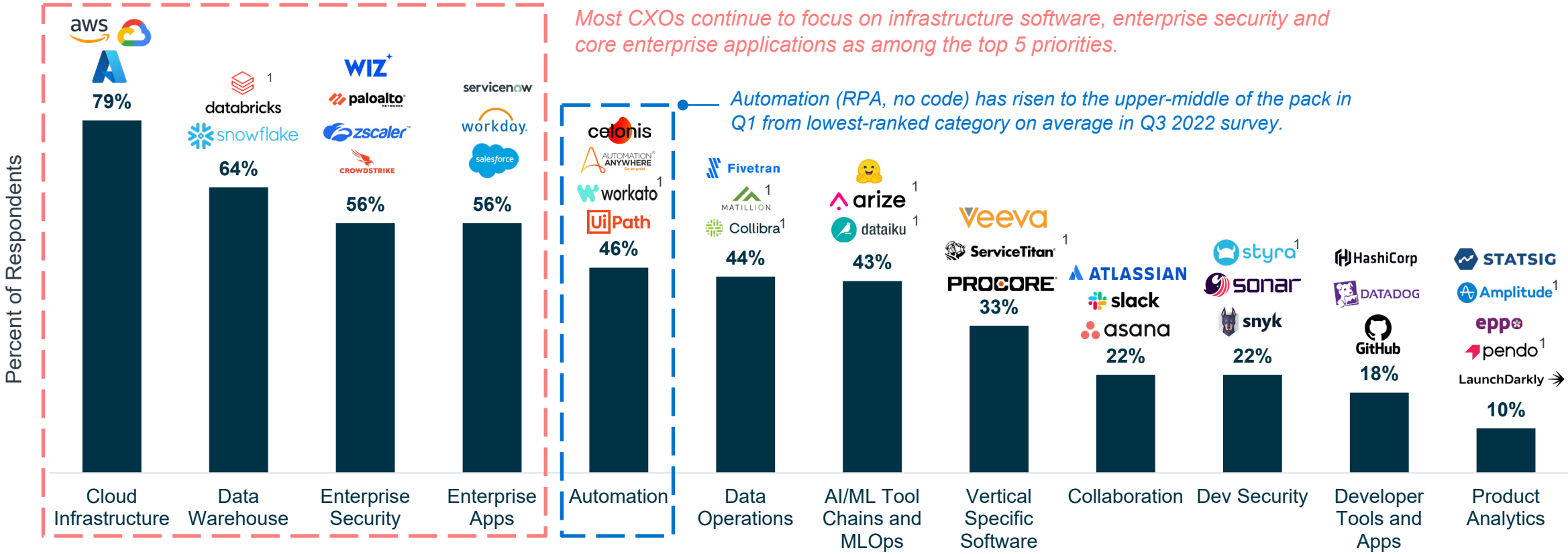
1. Most companies spend between $0.31-$0.60 on tools for every $1.00 spent on employees within the technology organization (i.e., engineers, developers, data scientists, etc.)
2. On average, financial services companies spend the highest amount on tools compared to headcount. Technology and health care companies are close behind.
3. Retail and e-commerce companies have the highest investment in people vs. technology, at nearly $1.00 of headcount for $0.30 in tools.

Source: Battery Q1 2023 Cloud Software Spending Survey

Cloud Software Spending Priorities

Cloud Software That is a Top 5 Priority for CXOs Over Next 12 Months

Example Companies:



Most CXOs continue to focus on infrastructure software, enterprise security and core enterprise applications as among the top 5 priorities.

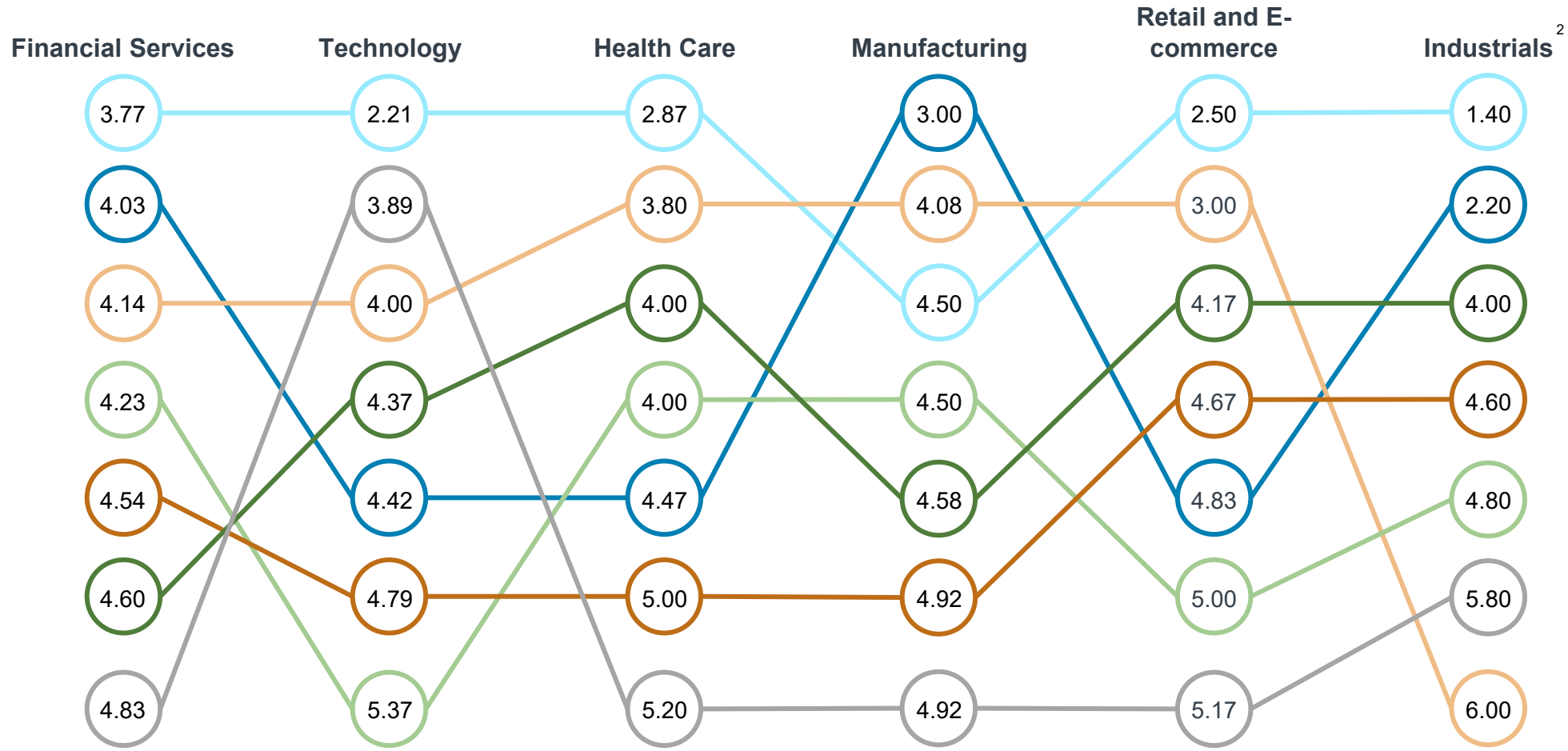
Automation (RPA, no code) has risen to the upper-middle of the pack in Q1 from lowest-ranked category on average in Q3 2022 survey.

Cloud infrastructure and the data warehouse are top spending priorities for most CXOs, with enterprise security and enterprise apps following closely behind.

Source: Battery Q1 2023 Cloud Software Spending Survey
Note: [1] denotes a past or current Battery company. For a full list of all Battery investments, please click here.

Industry Ranking of Top 7 Cloud Software Priorities

Ranking system where 1 is the company's top priority



Ranking of top spending priorities varies by industry and highlights where different industries are in their data journey; cloud infrastructure ranks consistently at the top for almost all.

Source: Battery Q1 2023 Cloud Software Spending Survey

Note 1: [1] denotes a past or current Battery company. For a full list of all Battery investments, please click here.

Note 2: Industrial segment includes aviation, construction, utilities, transportation and warehousing.

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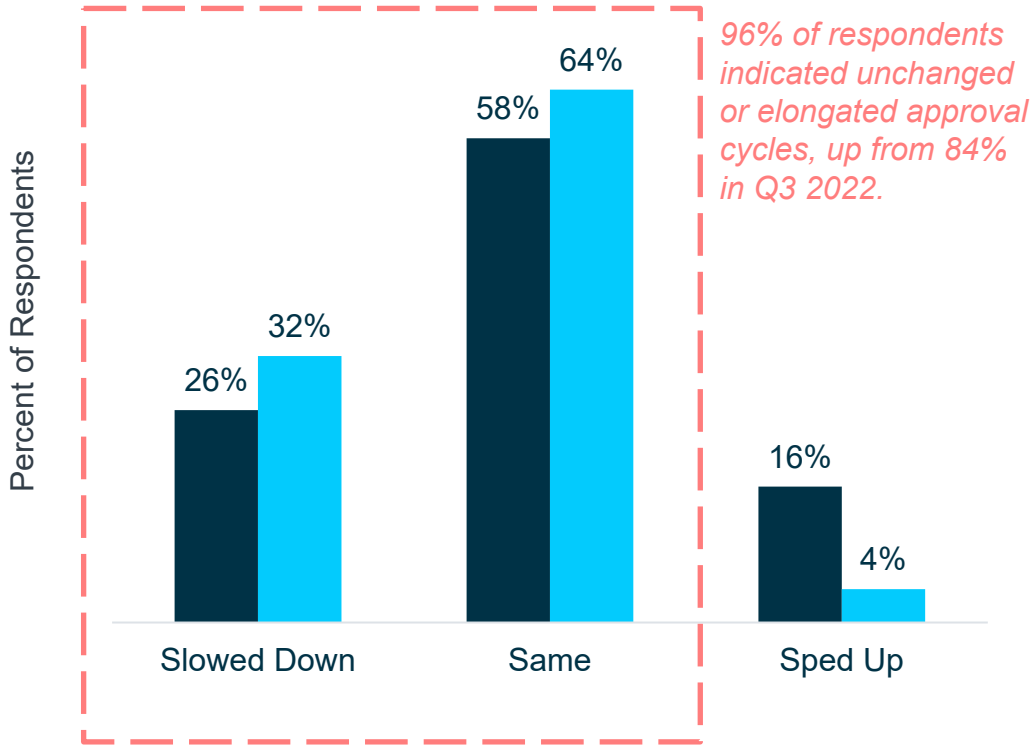
Software Adoption and Procurement Trends

Budgets Remain for High-Priority Software – Adoption and Cycles Slow

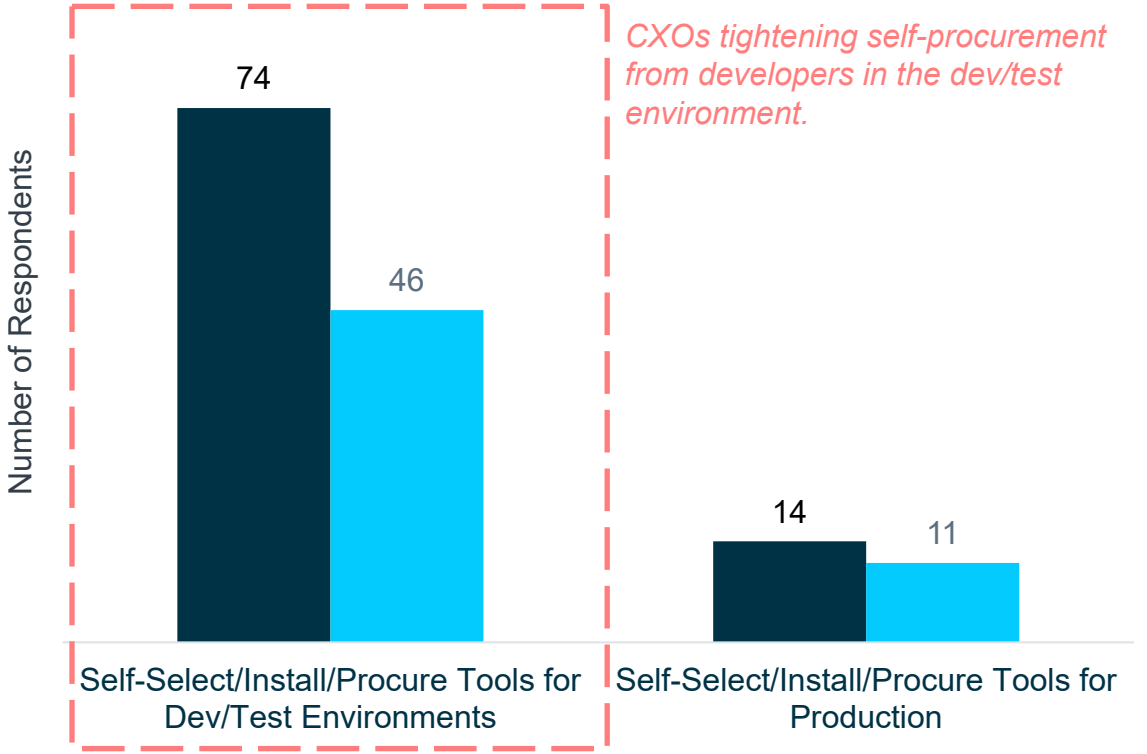
1. Enterprise adoption timelines continue to lengthen as market uncertainty persists
2. There is hesitation around allowing tool self-selection, even in dev/test environment
3. CXOs are leaning into cloud optimization solutions
4. CSP marketplaces are gaining traction due to ease of integration and governance
5. Innovation efforts remain within Tech / IT, but centralized innovation teams are growing
6. Companies are curious about generative AI, but primarily those with larger budgets

Enterprise and Bottoms-Up Software Adoption

Approval Times for Enterprise Contracts



Engineers Allowed to Self-Select Tools

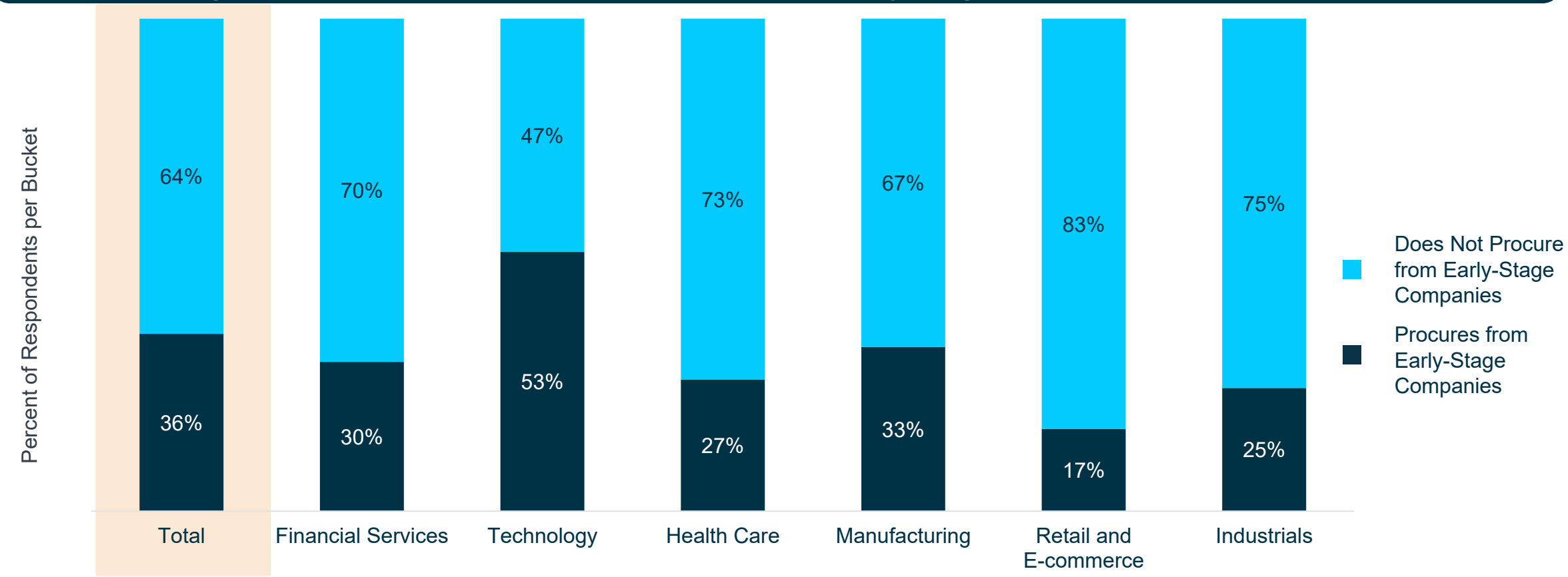


Enterprise contract approval times are seeing a slight slow down relative to last quarter; CXOs are tightening restrictions on self-procurement, even in the dev/test environment.

Source: Battery Q1 2023 Cloud Software Spending Survey

Enterprise Procurement Strategies

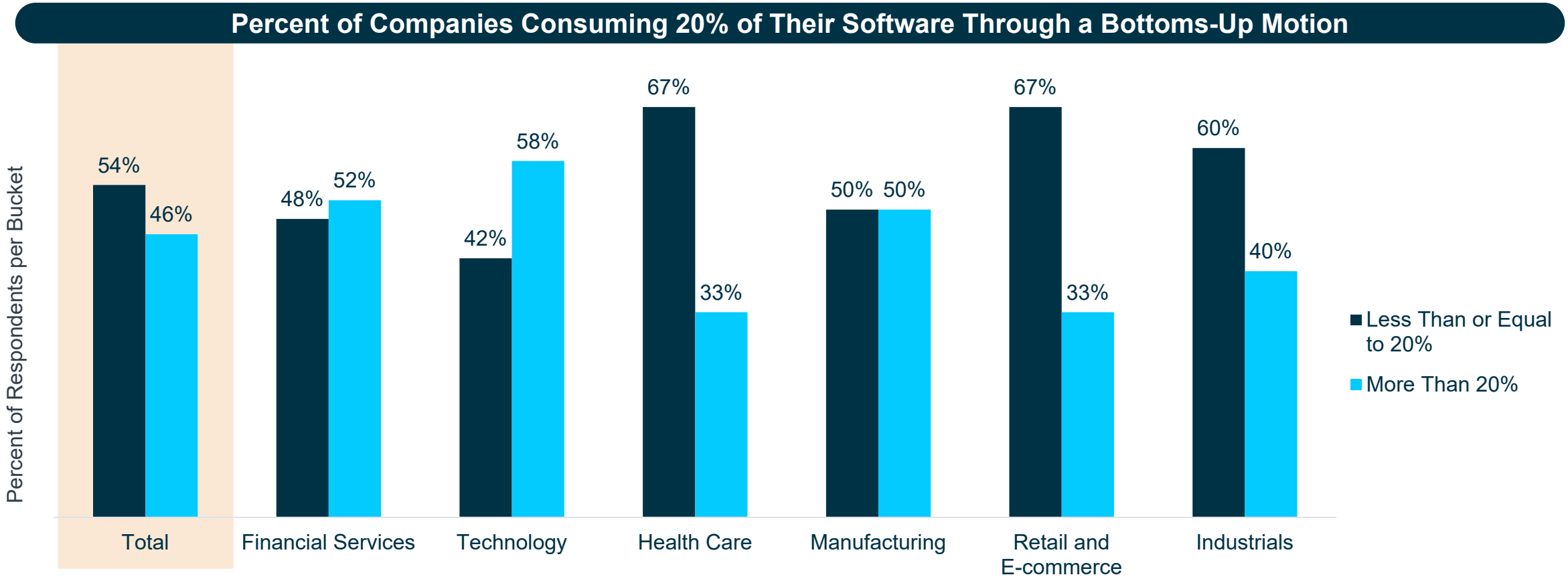
Organizations that Procure Cloud Software from Early-Stage (Seed, Series A) Companies



About 1/3 of companies procure software from early-stage companies. The technology industry leads the charge on early-stage procurement, while most other industries remain conservative.

Source: Battery Q1 2023 Cloud Software Spending Survey
Note: Industrial segments include construction, utilities, transportation, and warehousing.

Bottoms-Up Adoption Buying Patterns

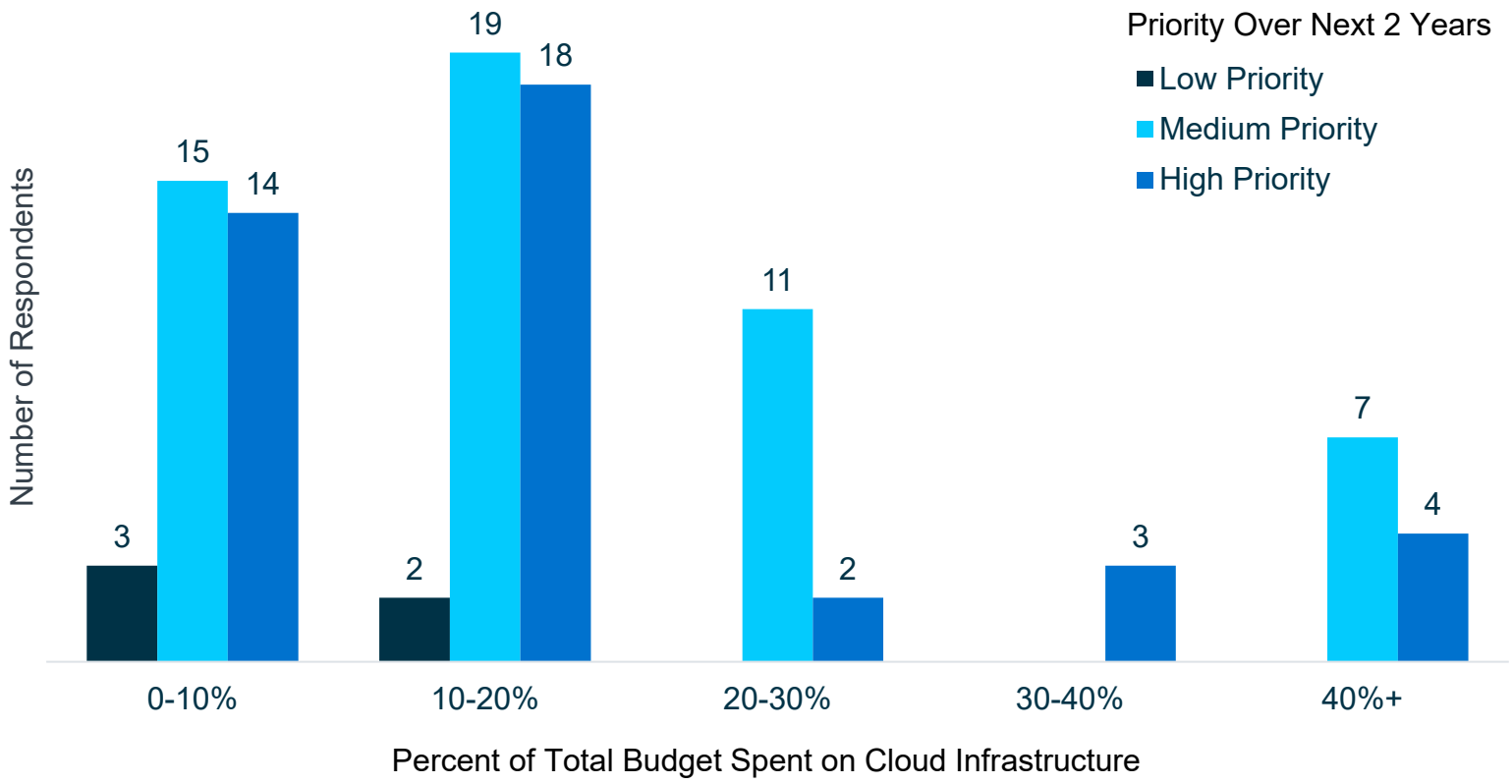


46% of all respondents note that their companies consume more than 20% of their software through a bottoms-up motion.

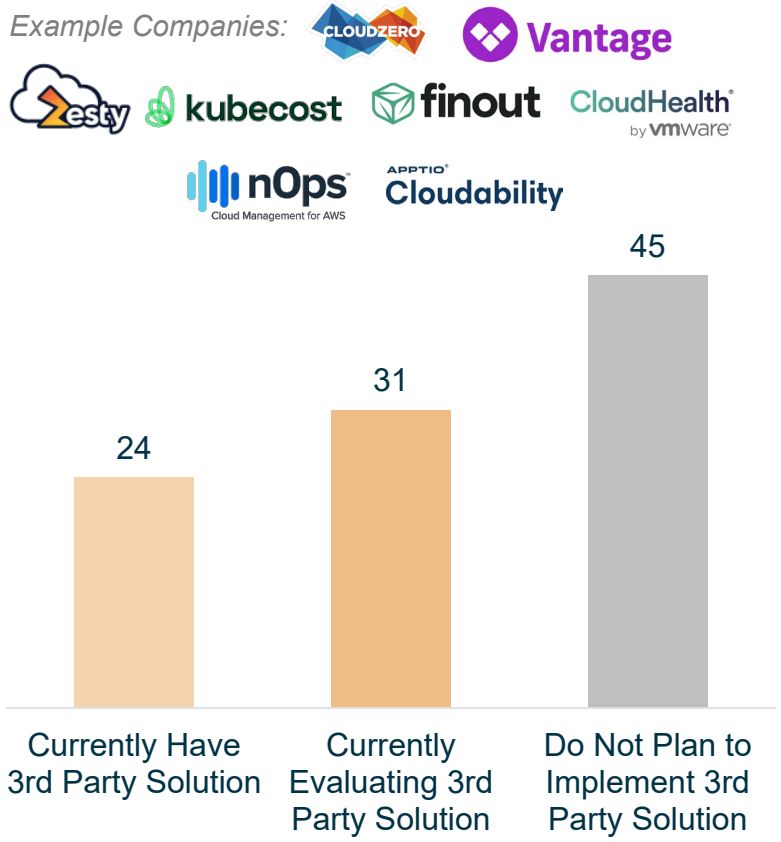
Source: Battery Q1 2023 Cloud Software Spending Survey
Note: Industrial segments include construction, utilities, transportation, and warehousing.

Cloud Cost Optimization Priority and Use of Non-CSP Solutions

Cloud Cost Optimization Priority by Budget Spent on Cloud Infrastructure



Use of Non-Cloud Provider Solutions

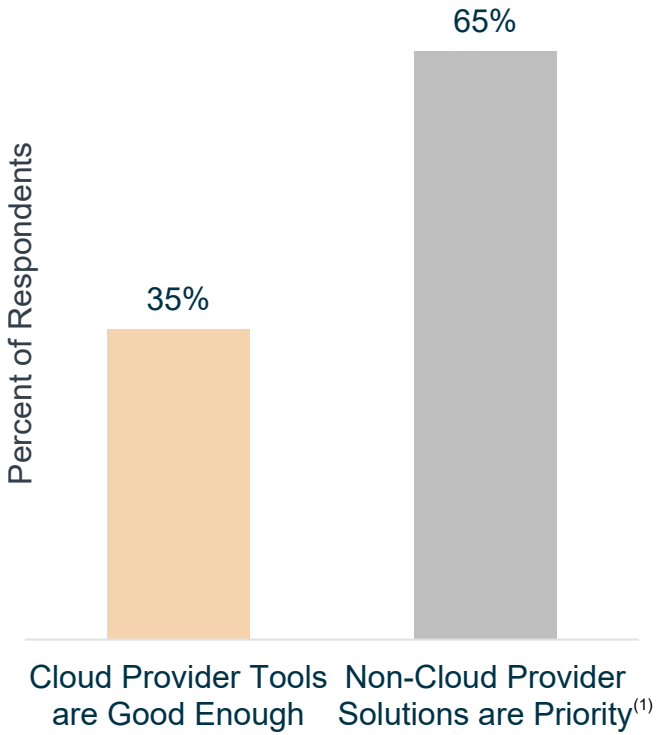


95% of CXOs consider cloud cost optimization either a medium or a high priority over the next 2 years; 55% are using 3rd party solutions.

Source: Battery Q1 2023 Cloud Software Spending Survey

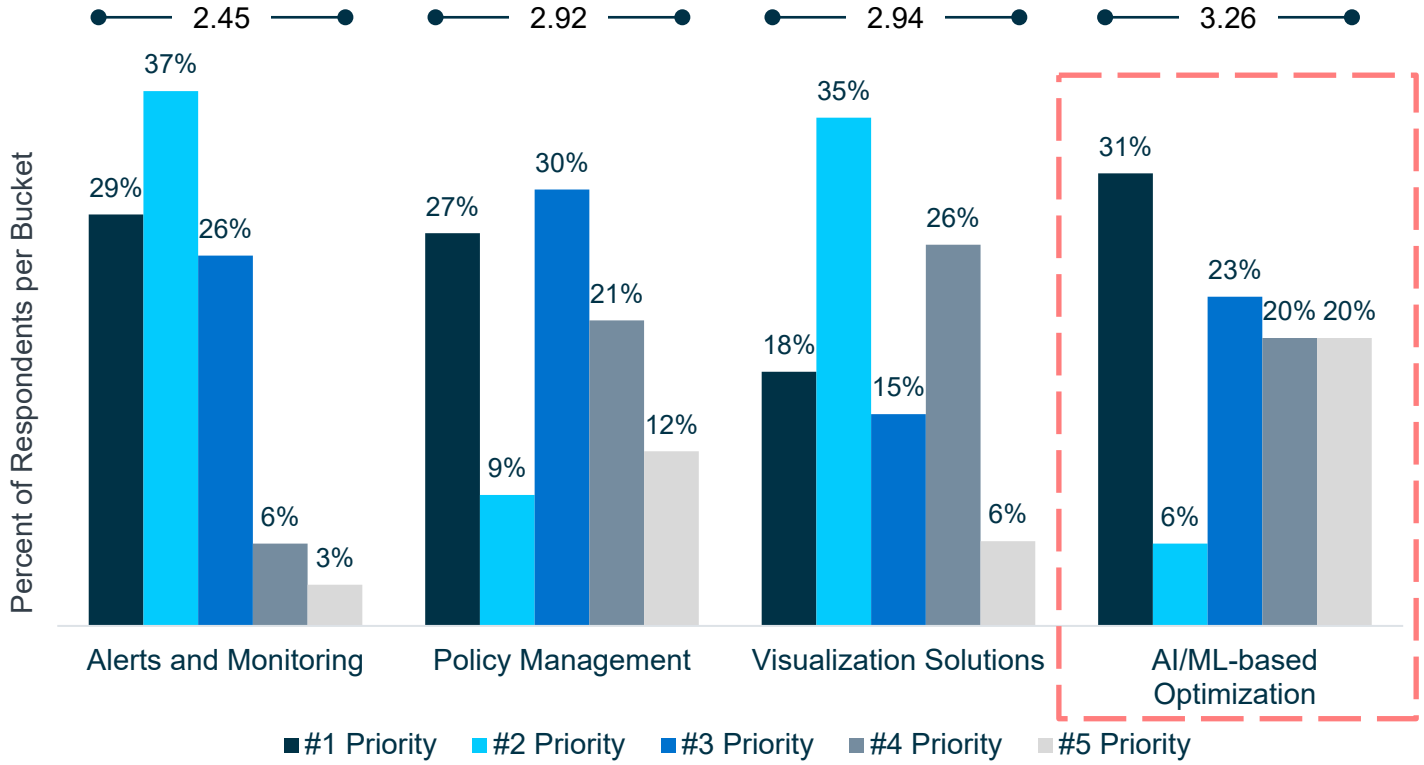
Interest and Priorities of 3rd Party Solutions for Cloud Cost Optimization

Interest in 3rd Party Solutions



Top Three 3rd Party Solution Priorities for Cloud Cost Optimization(2)

Average Rank (out of 5):
Ranking system where 1 is the company's top priority



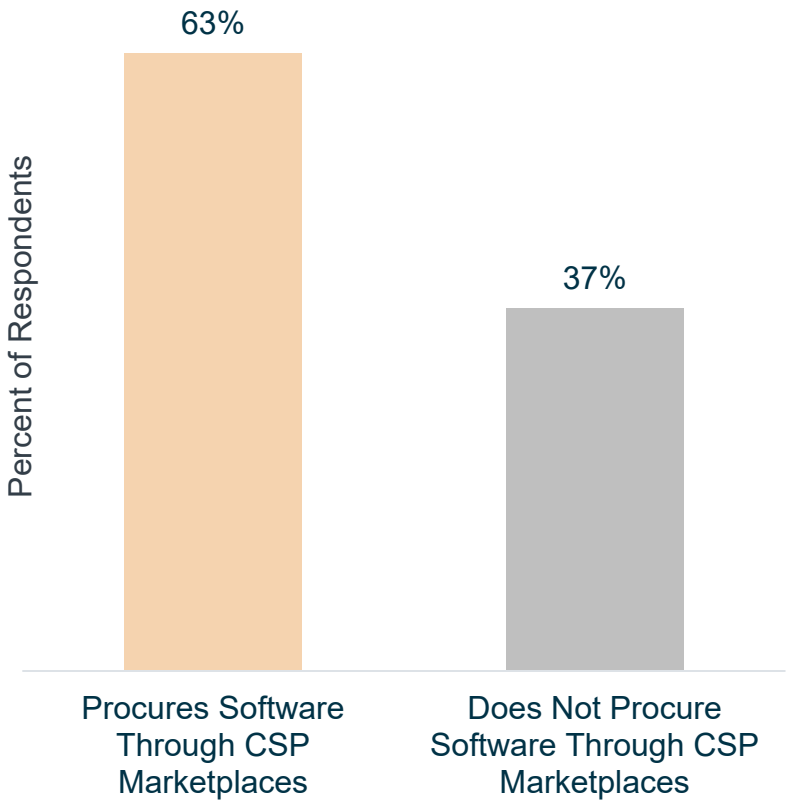
Despite AI/ML-based optimization having the lowest average rank, it was ranked a #1 priority by the most CXOs with 31%.

35% of CXOs find that cloud provider tools are good enough. Alerts and monitoring rank in the top 3 for most CXOs with other top priorities.

Source: Battery Q1 2023 Cloud Software Spending Survey
(1) Denotes the percentage of respondents that selected "Cloud Provider Tools are Good Enough" as their top choice
(2) Only accounts for the respondents that did not select "Cloud Provider Tools are Good Enough" as their top choice

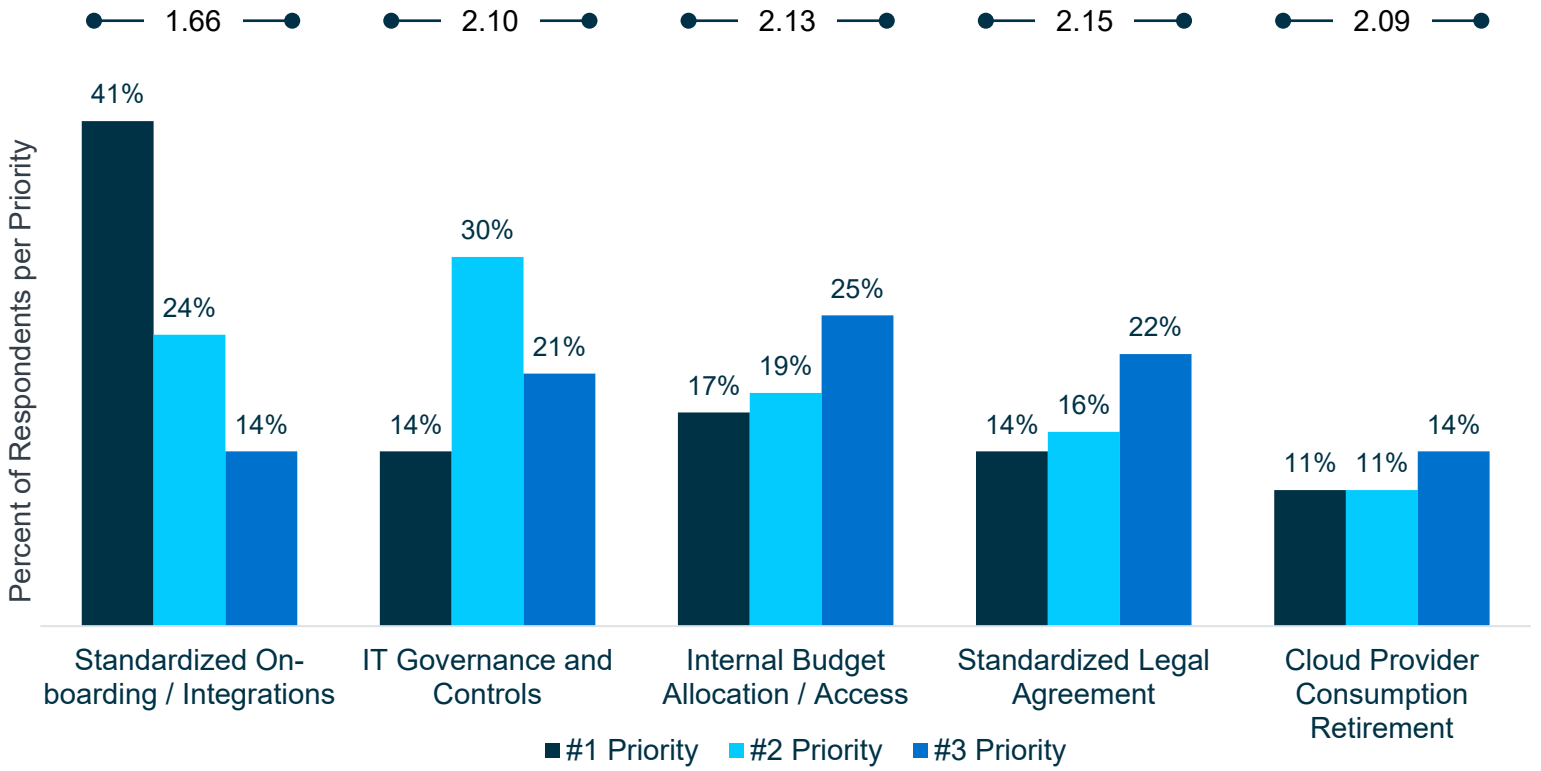
Procurement of Software Through Cloud Service Provider Marketplaces

Procurement Through CSP Marketplaces



Top 3 Reasons For Procuring Software Through CSP Marketplaces

Average Rank (out of 3):
Ranking system where 1 is the company's top priority

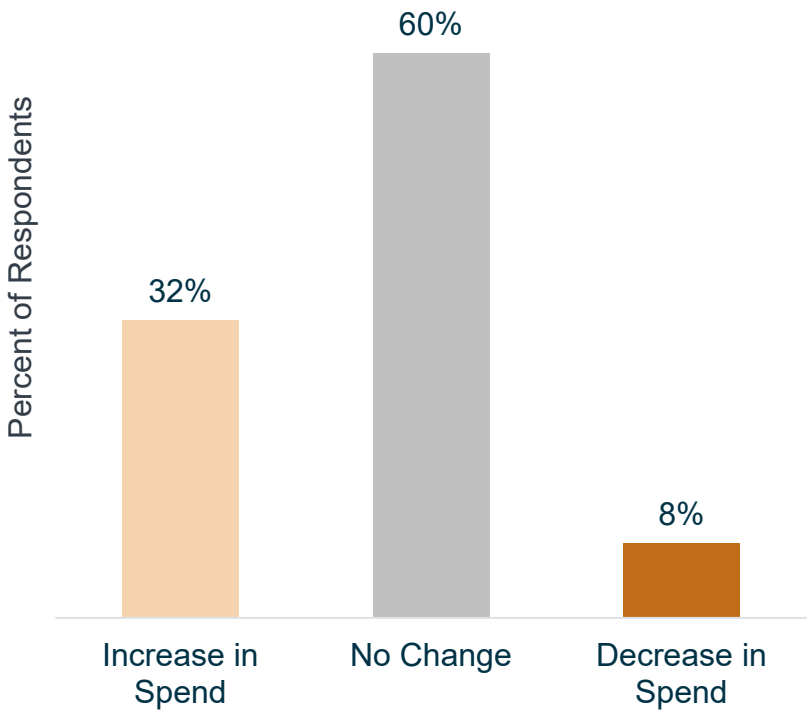


The majority of CXOs procure software through CSP marketplaces with standardized on-boarding and integrations as a leading driver.

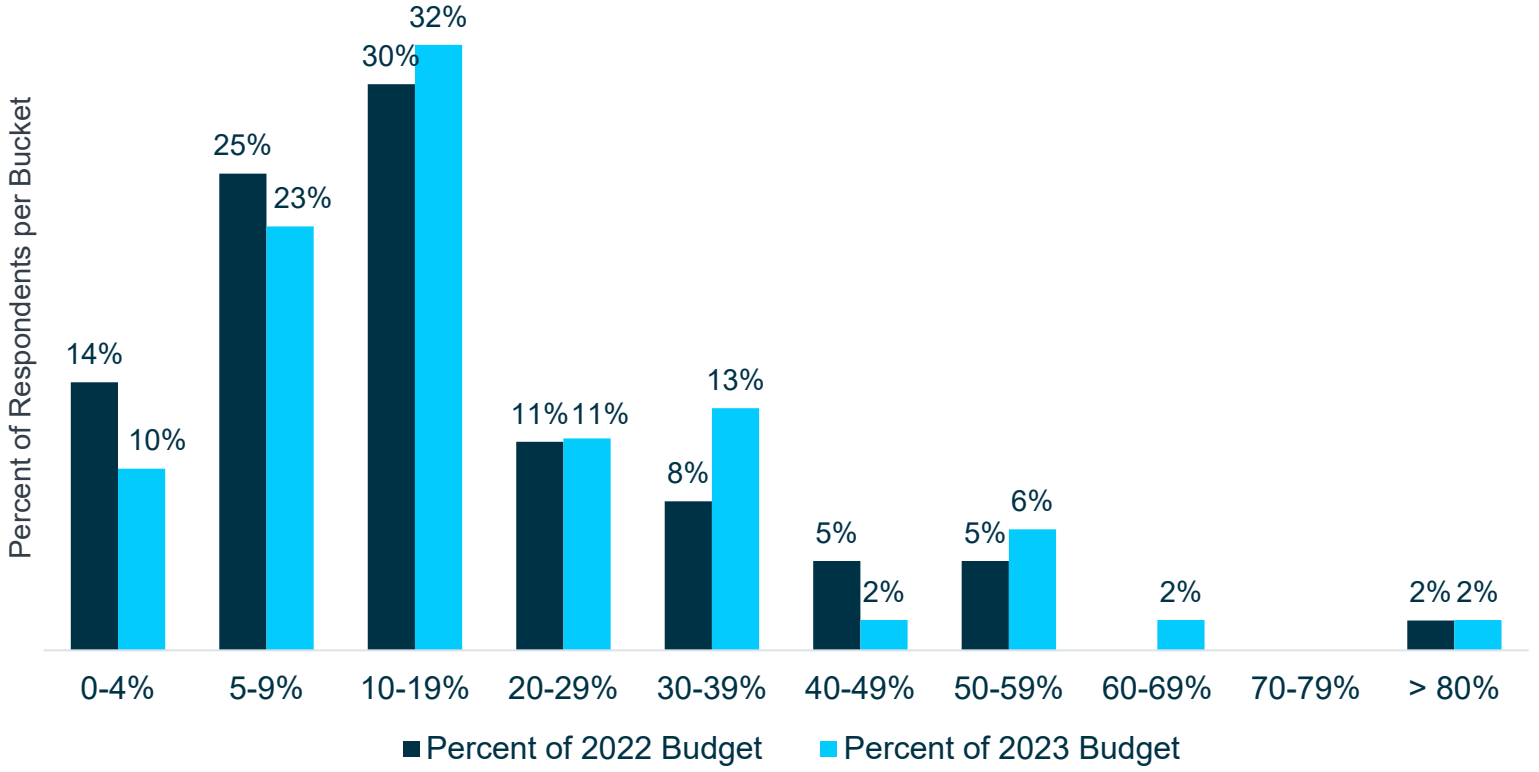
Source: Battery Q1 2023 Cloud Software Spending Survey

Spend Through Cloud Service Provider Marketplaces in 2022 and 2023

Plan for CSP Spend 2023 vs. 2022



Percent of Total Technology Budget Spent Through Marketplace 2022, 2023

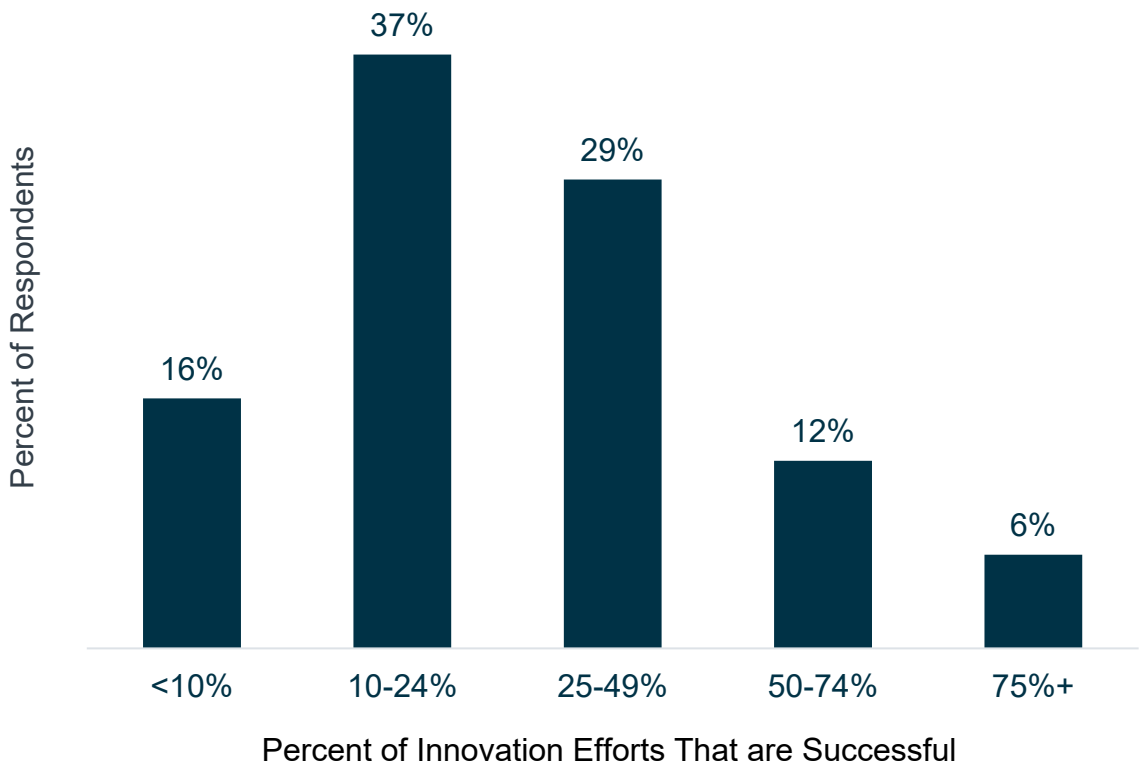


32% of CXO respondents expect to spend more with CSP marketplaces in 2023 than they spent in 2022.

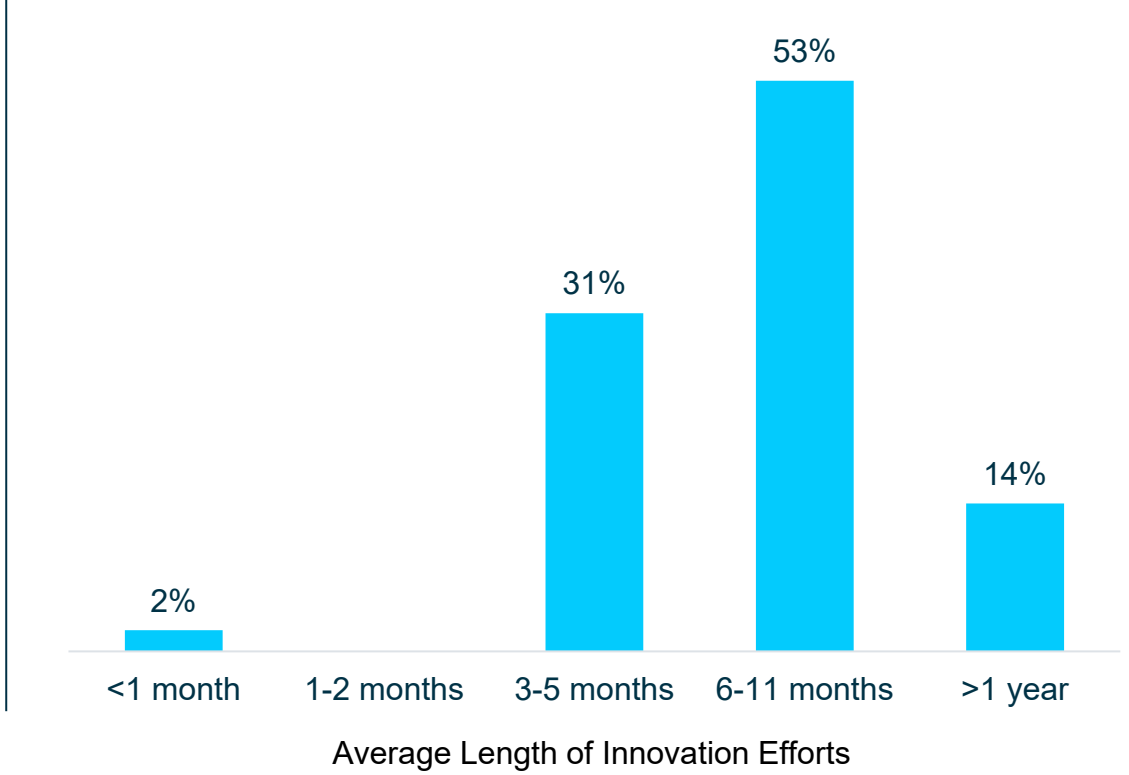
Source: Battery Q1 2023 Cloud Software Spending Survey

Success Rate and Average Timeline of Innovation Efforts

Percent of Successful Innovation Efforts



Timeline of the Average Innovation Effort

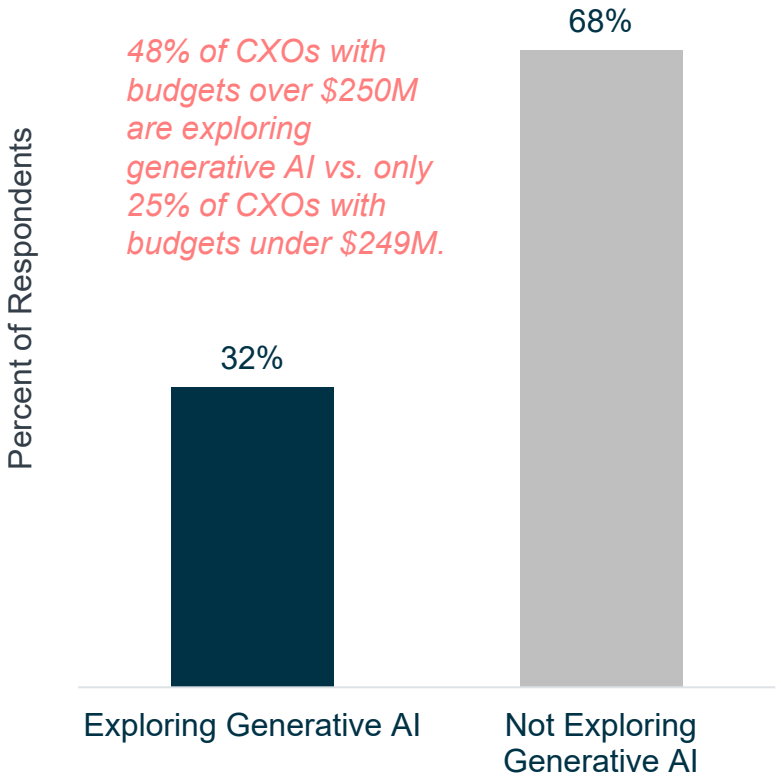


More than 50% of innovation efforts have a success rate below 25%; most innovation efforts take around 6-11 months to implement.

Source: Battery Q1 2023 Cloud Software Spending Survey

Companies Exploring Generative AI and Why

Organizations Exploring Gen AI

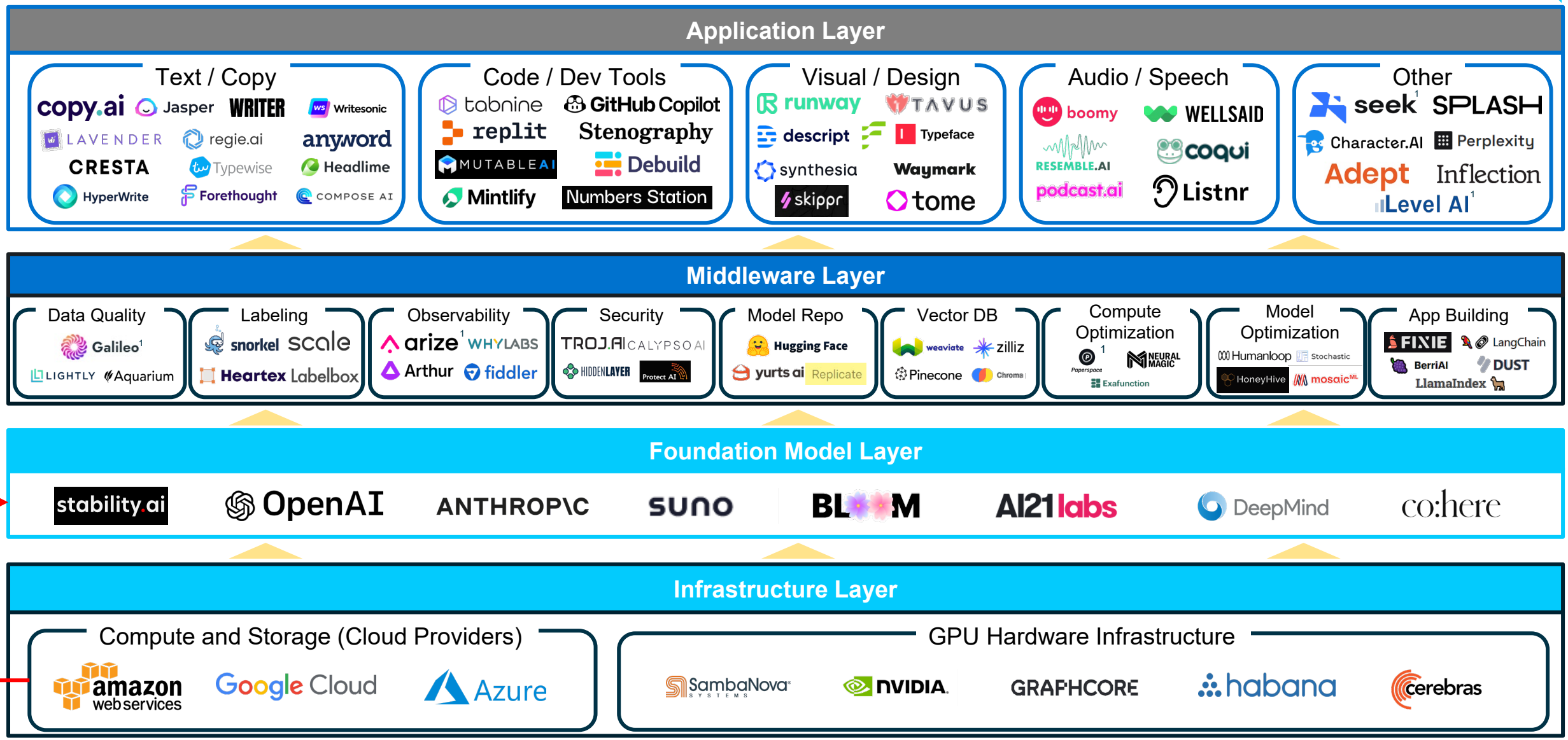


Early In Evolution – What's Next?

1. Enterprises are still exploring how to interact with foundation models and whether the right approach is bringing a **model to their proprietary data (Model to Data)** or **their data to an external model (Data to Model).**
2. Many organizations are still **working to operationalize their data**, which is leading to accelerated adoption of technologies like data labeling, embedding models, vector databases and search, data quality, observability and governance.
3. Over 75% of CXOs who are currently exploring generative AI viewed **improved productivity and workflows** as a key driver behind their interest in the space.
4. 48% of CXOs who are exploring generative AI today noted that **governance was the top tool that is missing** within the current toolchain.

Source: Battery Q1 2023 Cloud Software Spending Survey

Generative AI Landscape



Note: [1] denotes a past or current Battery company. For a full list of all Battery investments, please click here.

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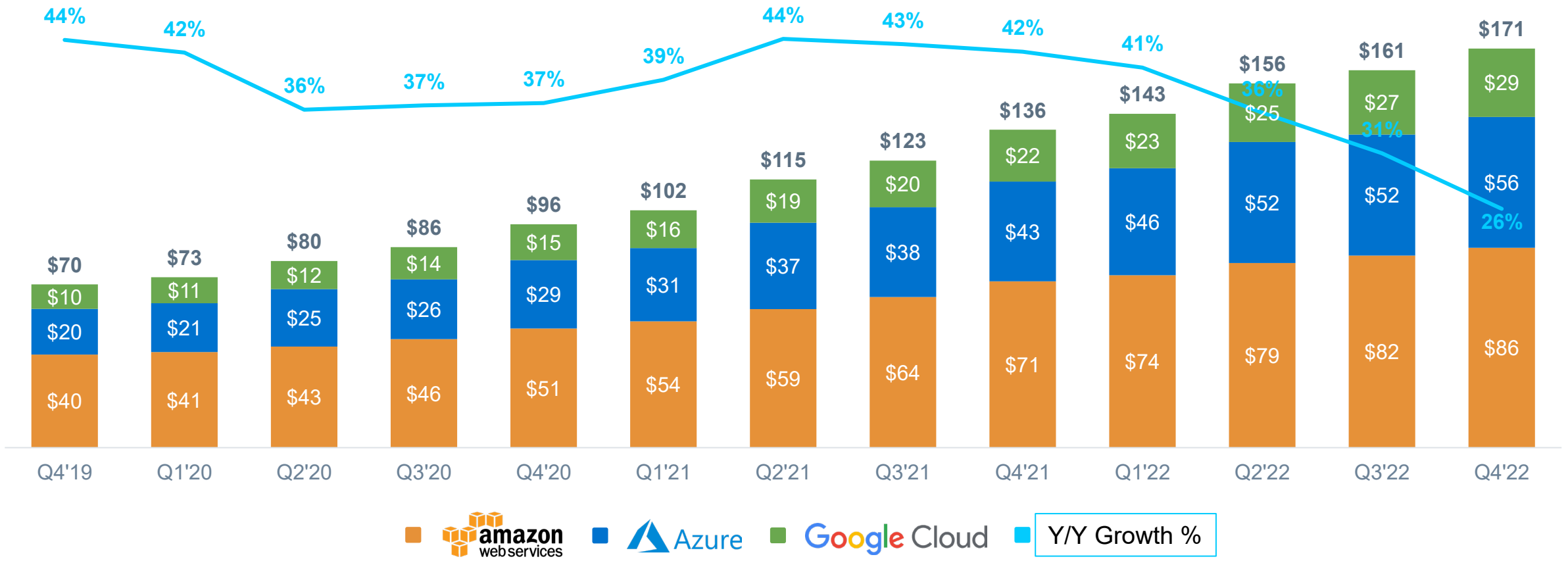
Future of Cloud Software Spending

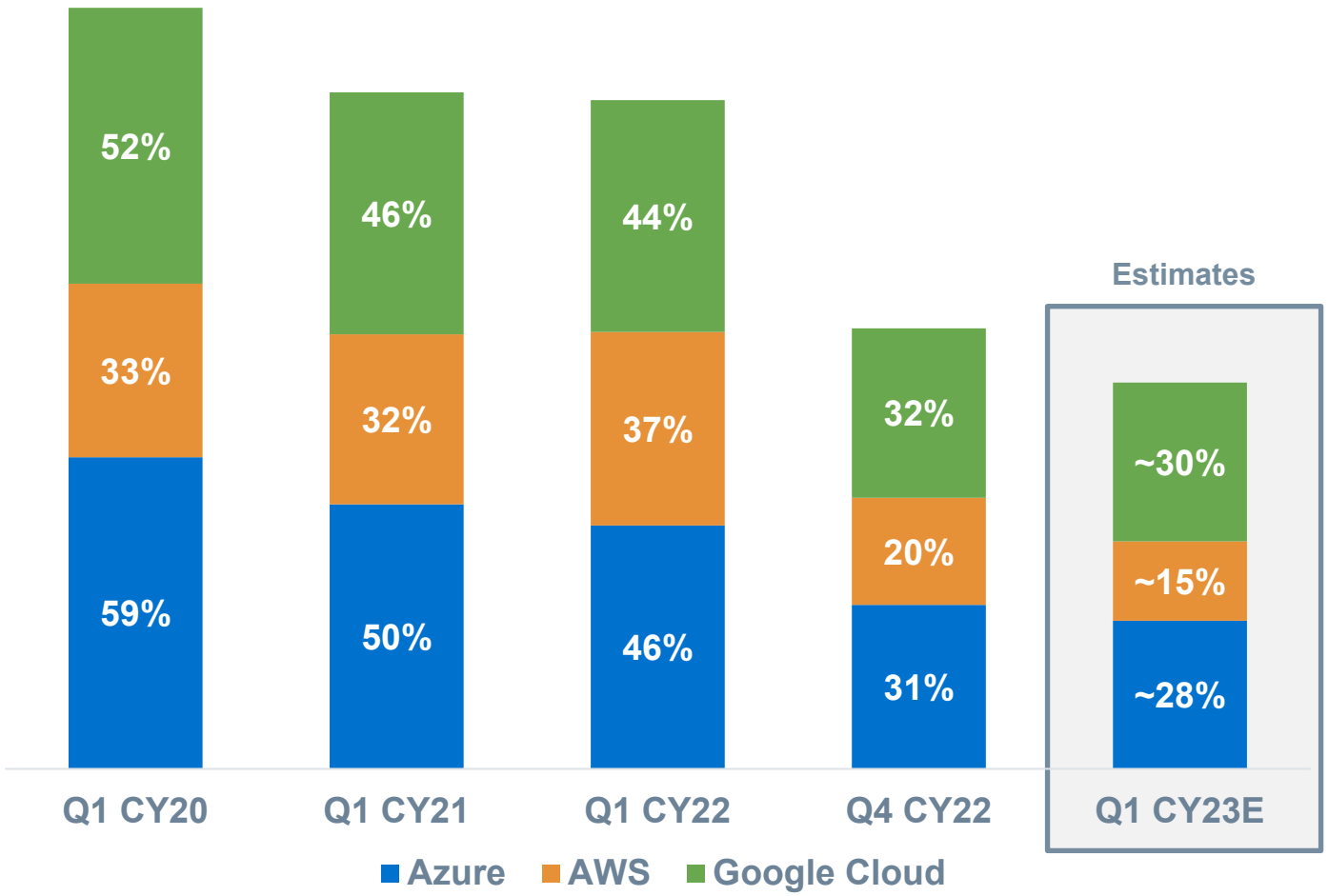
Cloud Vendors Facing Headwinds from Macro-Driven Spending Caution

Cloud Vendor Annualized Run-Rate Revenue (US$B)



Note: Growth rates reflect FX-adjusted figures (i.e., not constant currency).
Source: Company filings, Wall Street Research.

Cloud Vendor Growth Deceleration



Public Company Commentary

*"In Q4, we **saw slower growth of consumption as customers optimized GCP costs**, reflecting the macro backdrop."*

*"We expect these optimization efforts will continue to be a headwind to AWS growth in at least the next couple of quarters. So far in the first month of the year, AWS year-over-year **revenue growth is in the mid-teens**.*

*"Growth continued to moderate, particularly in December, and we **exited the quarter with Azure constant currency growth in the mid-30s."***

Note: Growth rates reflect FX-adjusted figures (i.e., not constant currency).
Source: Company filings, Wall Street Research.

Alongside Slower Growth, Cloud Vendors Face Margin Pressure

	amazon web services™		Microsoft Azure		Google Cloud	
	Q4'21	Q4'22	Q4'21	Q4'22	Q4'21	Q4'22
Quarterly Cloud Revenue	$18B	$21B	$11B	$14B	$6B	$7B
Annualized Cloud Revenue	$71B	$86B	$43B	$56B	$22B	$29B
Y/Y Growth %	40%	20%	46%	31%	45%	32%
Cloud GAAP Operating Margin	30%	24%	46%	41%	(16%)	(7%)

Note: Growth rates reflect FX-adjusted figures (i.e., not constant currency).
Source: Company filings, Wall Street Research.

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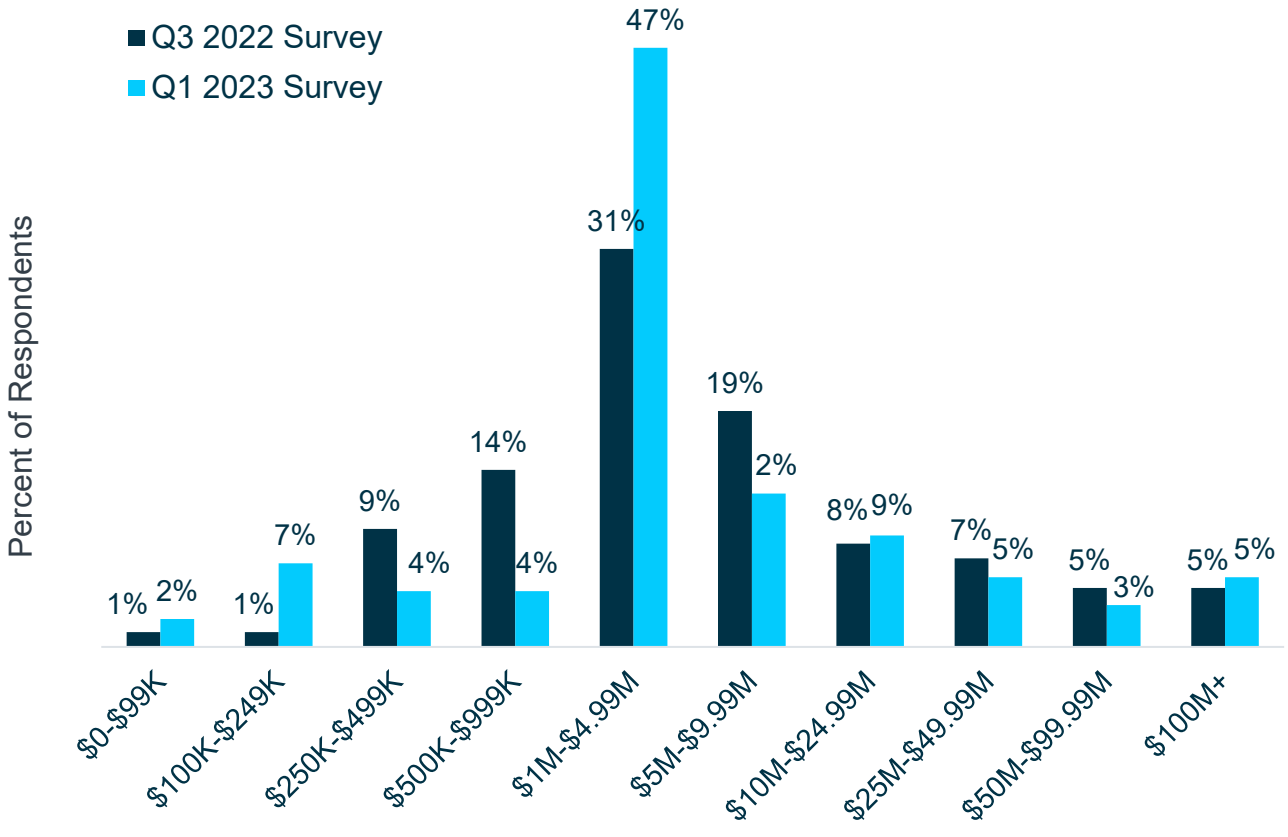
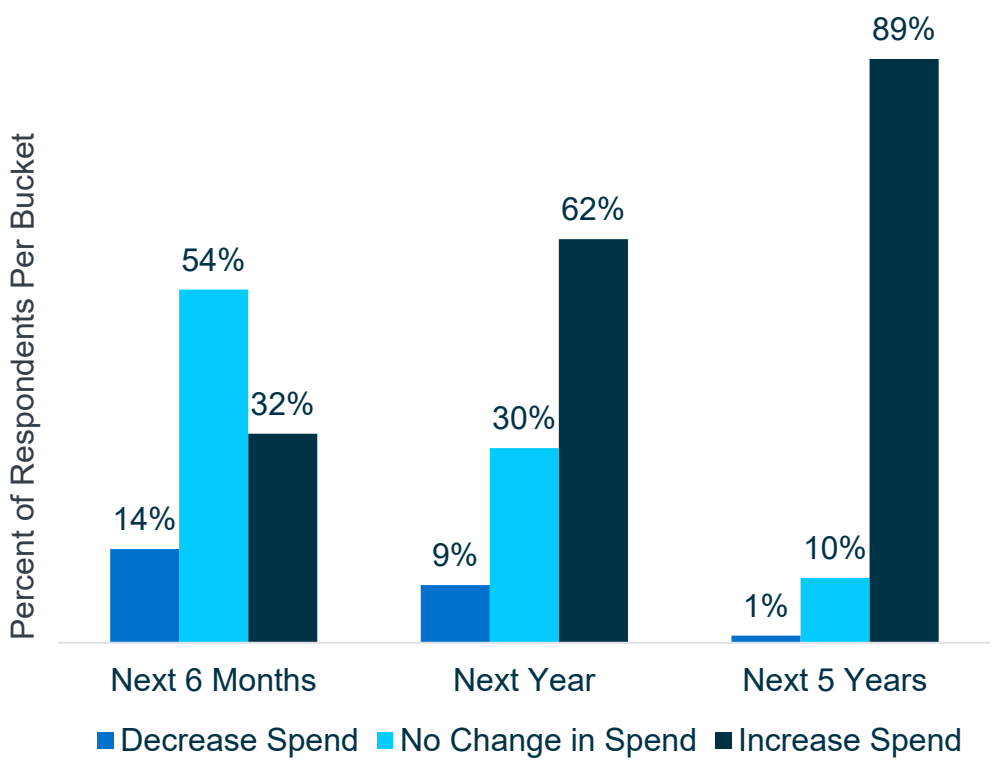
Appendix: Security Budget

Total Budget Size and Expected Spending Change for Security Vendors

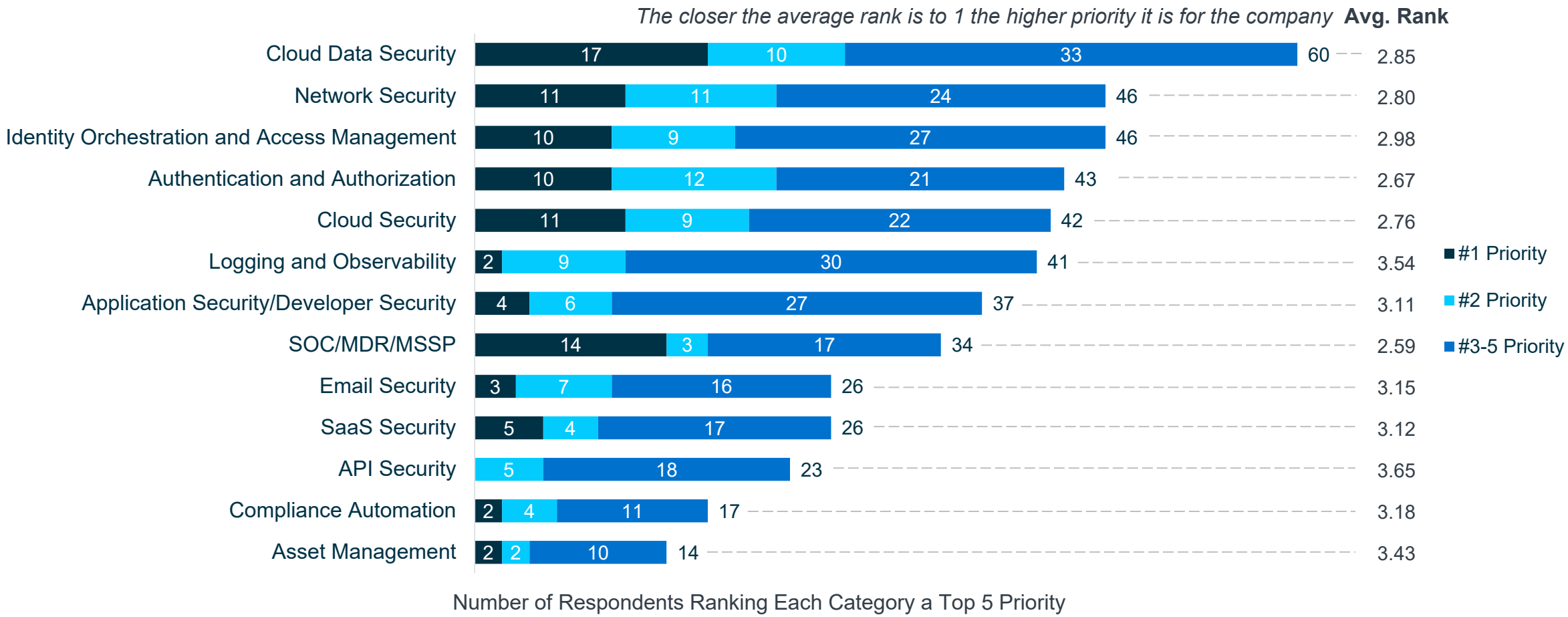




Majority of security budgets still fall in the $1-5M range. 32% of respondents plan to increase spend in the next 6 months; up to 62% plan to increase spend over the next yea

Source: Battery Q1 2023 Cloud Software Spending Survey

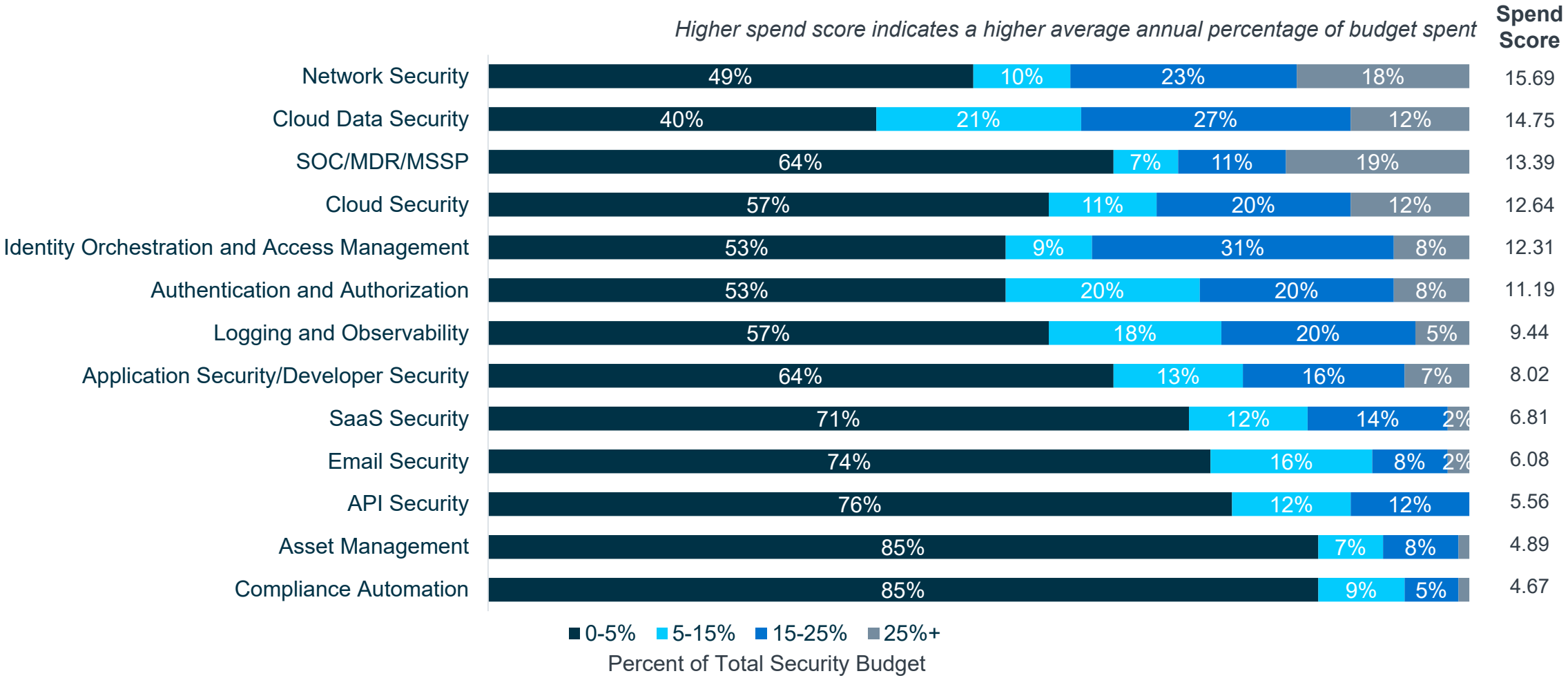
Companies Ranking Their Top 5 Priorities Within Security



Cloud data security is a growing priority within broader cloud security budgets. Security program maturity is determined by priority rank of SOC/MDR solutions.

Source: Battery Q1 2023 Cloud Software Spending Survey

Security Budget Allocation Across Categories



Security replacement cycles are long as network security remains a top spending category among security teams. Logging and observability budget is shared by development and security teams.

Source: Battery Q1 2023 Cloud Software Spending Survey
Note: Spend score is calculated as the weighted average of the provided range midpoint scaled by the number of respondents e.g., 2.5% for the 0-5% spend category; respondents that did not input a number are not reflected as 0% in the graph.

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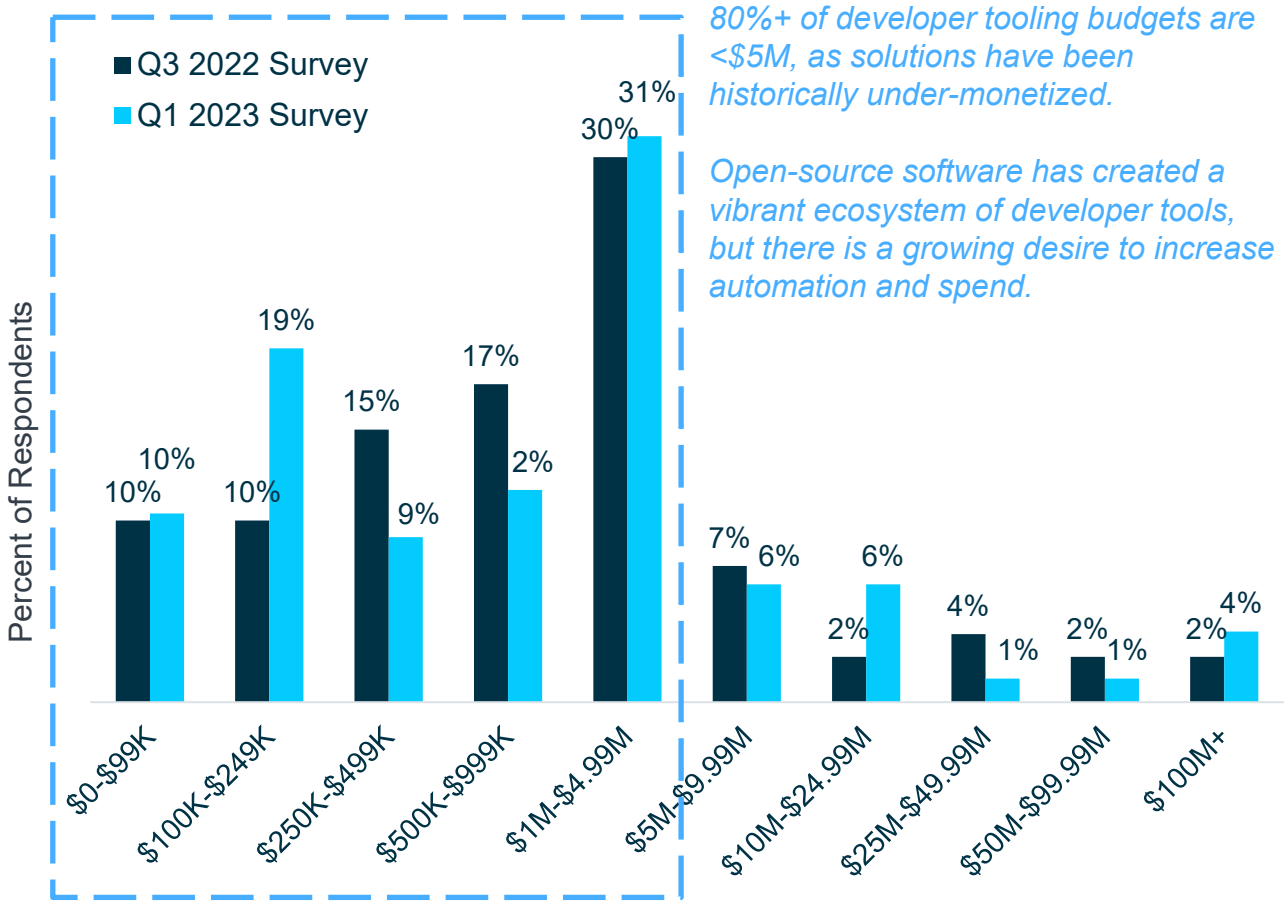
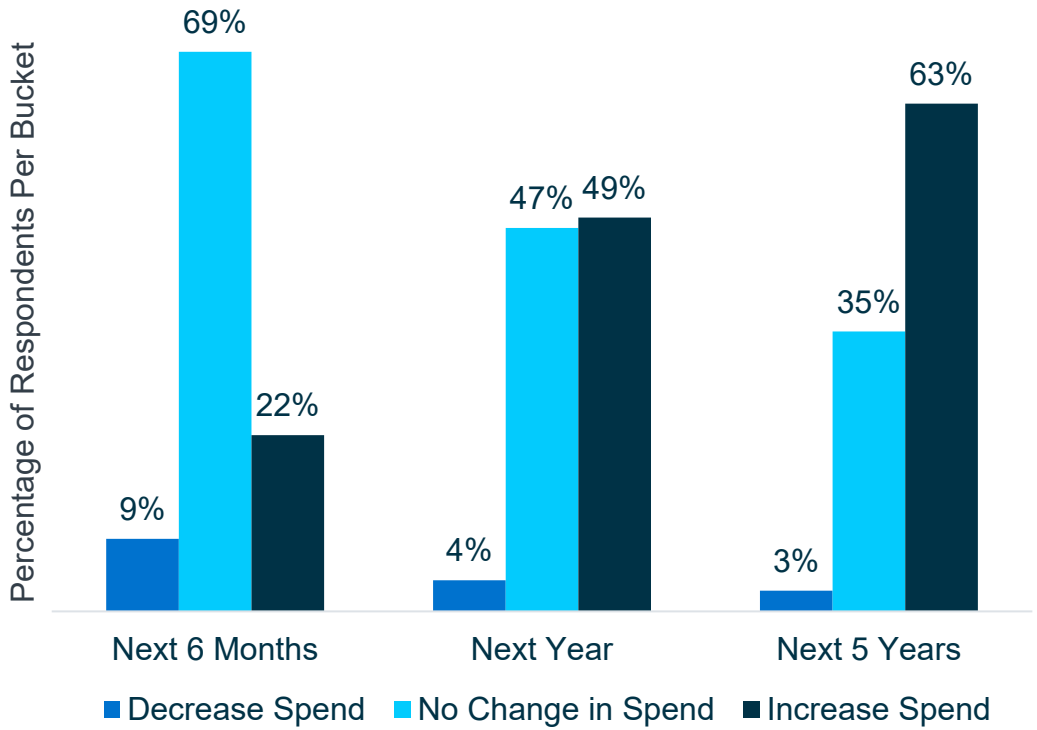
Appendix:
Developer Tools Budget

Total Budget Size and Expected Spending Change for Developer Tool Vendors



80%+ of developer tooling budgets are <$5M, as solutions have been historically under-monetized.

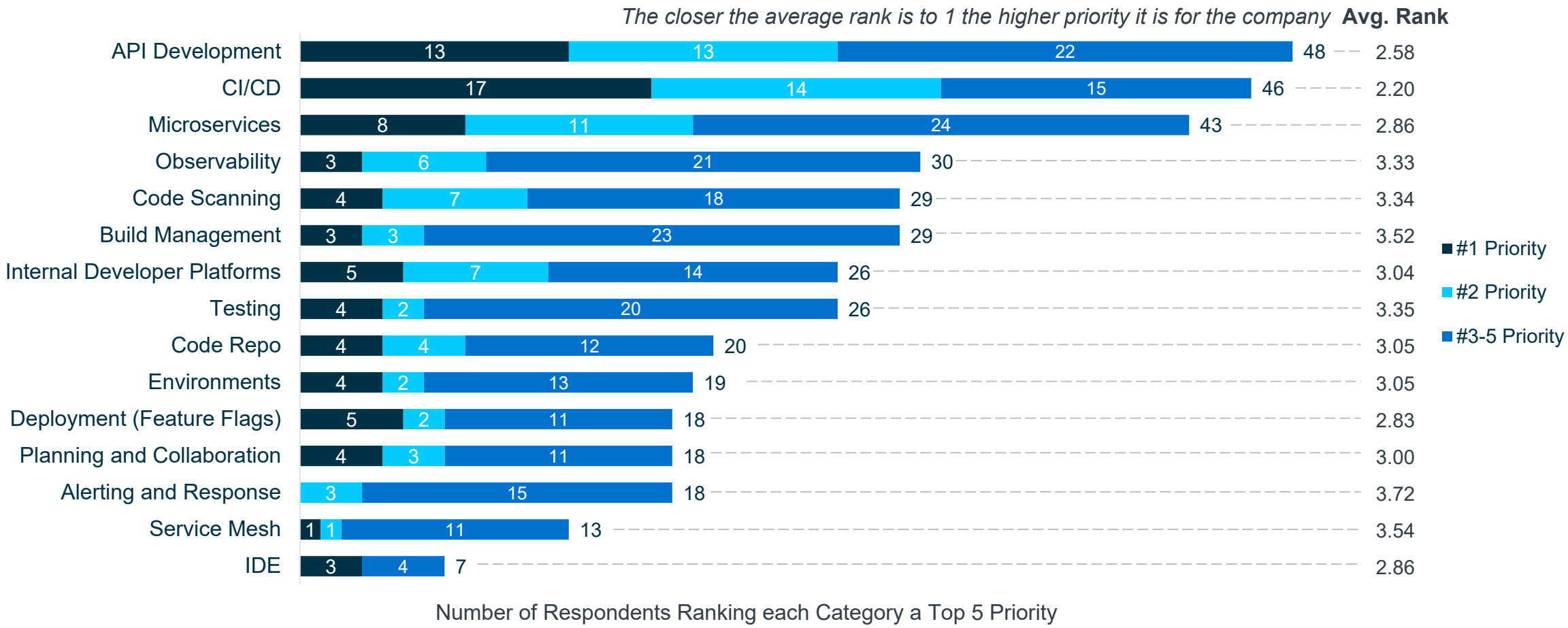
Open-source software has created a vibrant ecosystem of developer tools, but there is a growing desire to increase automation and spend.



Developer tools have historically been under-monetized. Most developer tool budgets fall in the $1-5M range; ~50% of respondents expect to increase developer tool budgets within the next year.

Source: Battery Q1 2023 Cloud Software Spending Survey

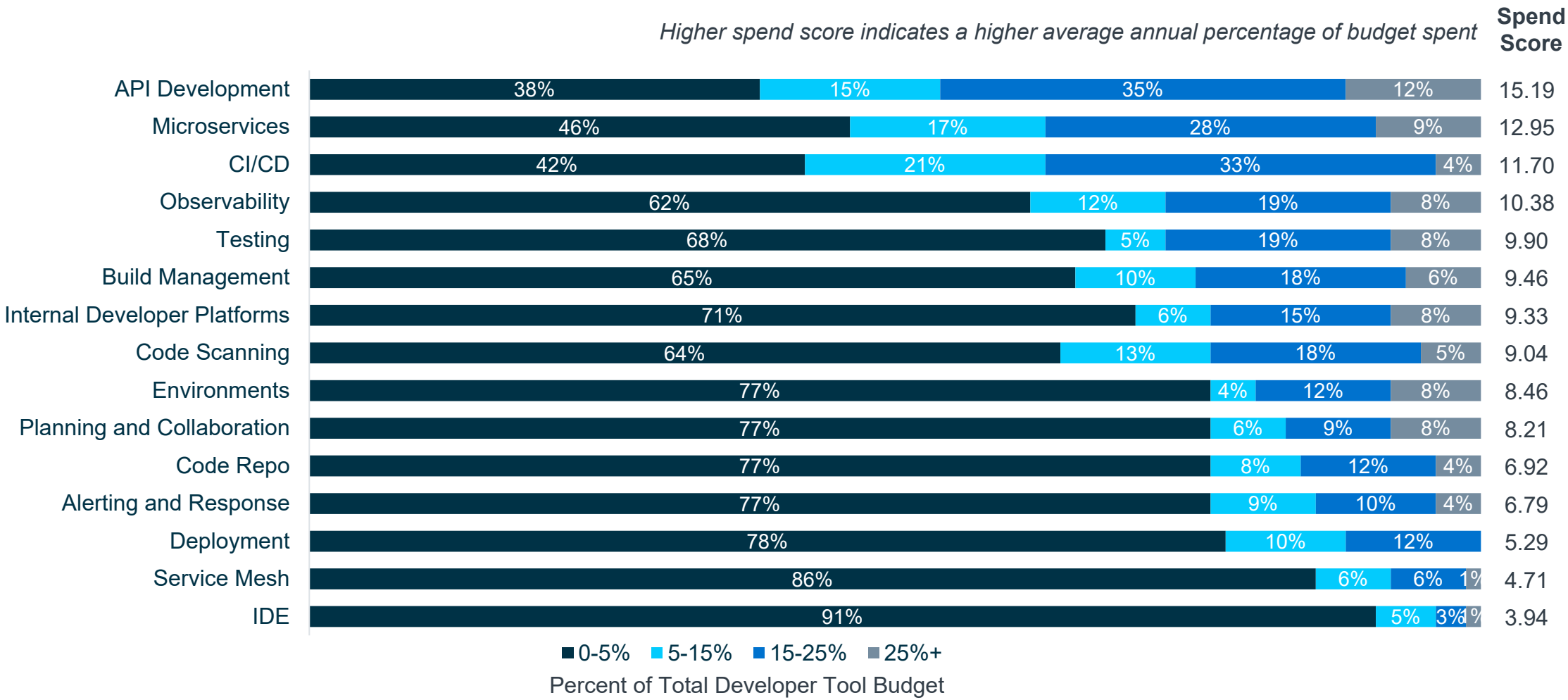
Companies Ranking Top 5 Priorities within Developer Tools



Speed, safety and resiliency are still the top developer tool priorities as enterprises focus on streamlining code into production reliably. AppSec and observability are shared by development and security teams.

Source: Battery Q1 2023 Cloud Software Spending Survey

Developer Tool Budget Allocation Across Categories



As application architecture becomes more distributed, service-oriented and API driven, getting code from dev/test to production reliability, securely and efficiently remains the top spending priority.

Source: Battery Q1 2023 Cloud Software Spending Survey
Note: Spend score is calculated as the weighted average of the provided range midpoint i.e., 5% for the 1-10% spend category

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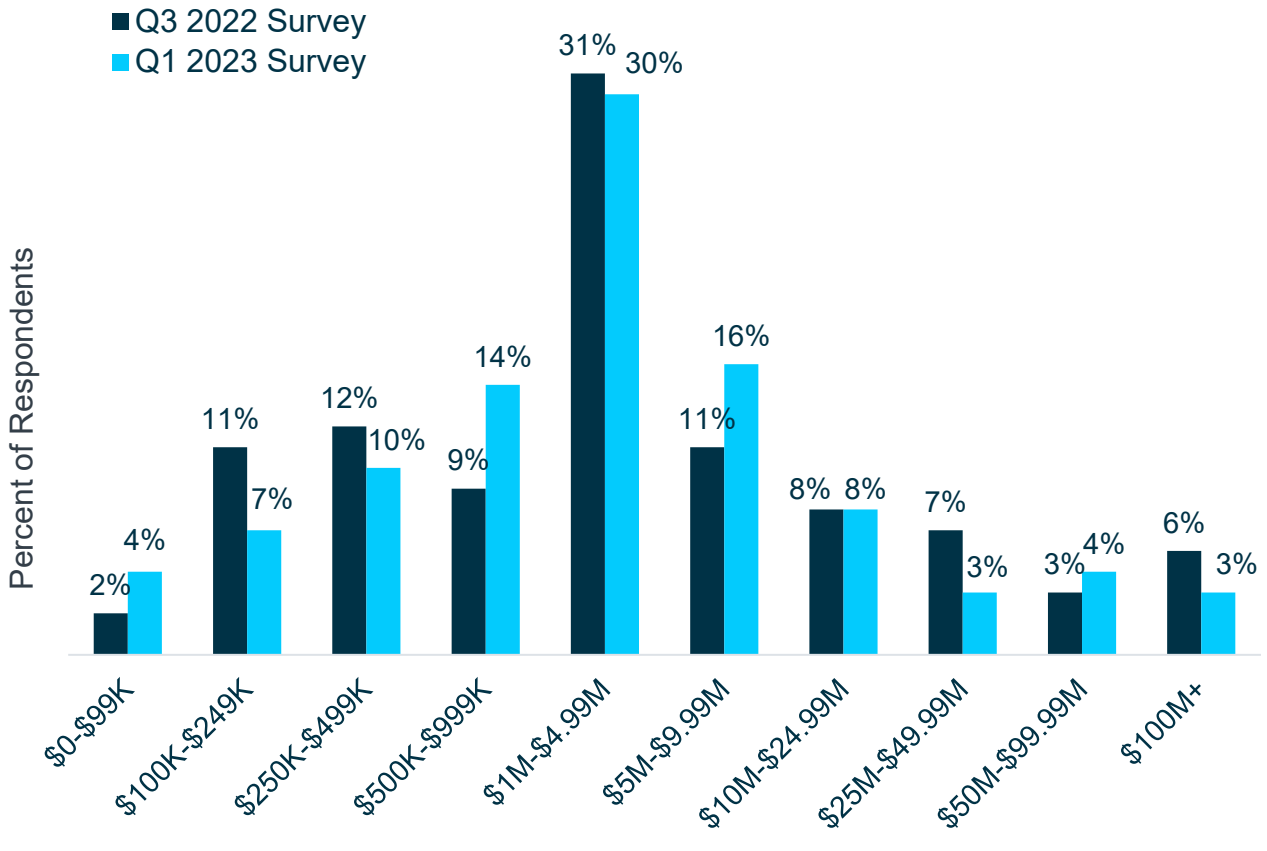
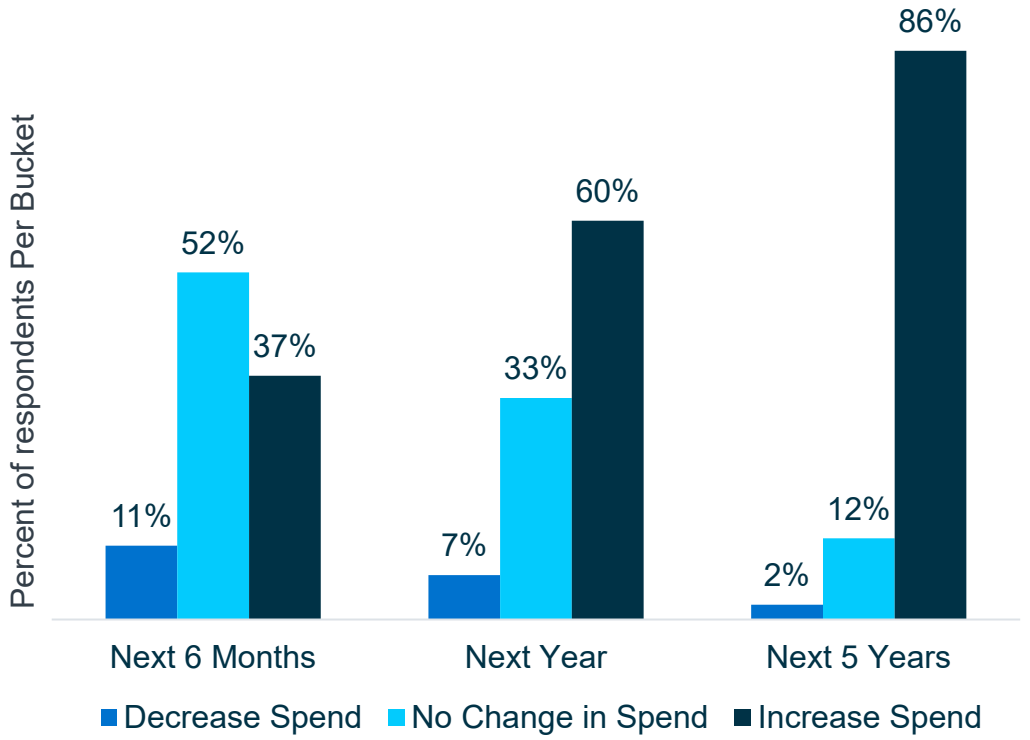
Appendix: Data Budget

Total Budget Size and Expected Spending Change for Data Vendors

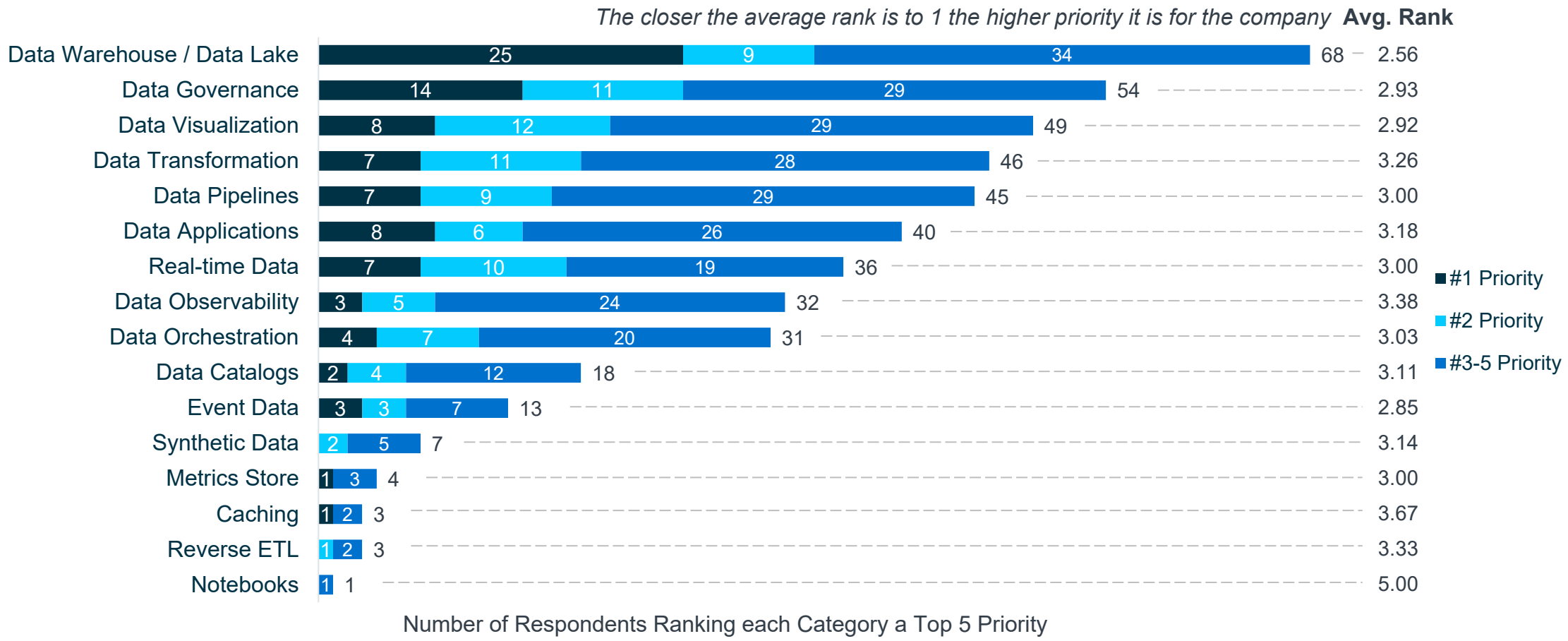




Majority of data budgets fall in the $1-5M range. 60% of CXOs are expecting to increase spend over the next year, increasing to 86% in the next 5 years.

Source: Battery Q1 2023 Cloud Software Spending Survey

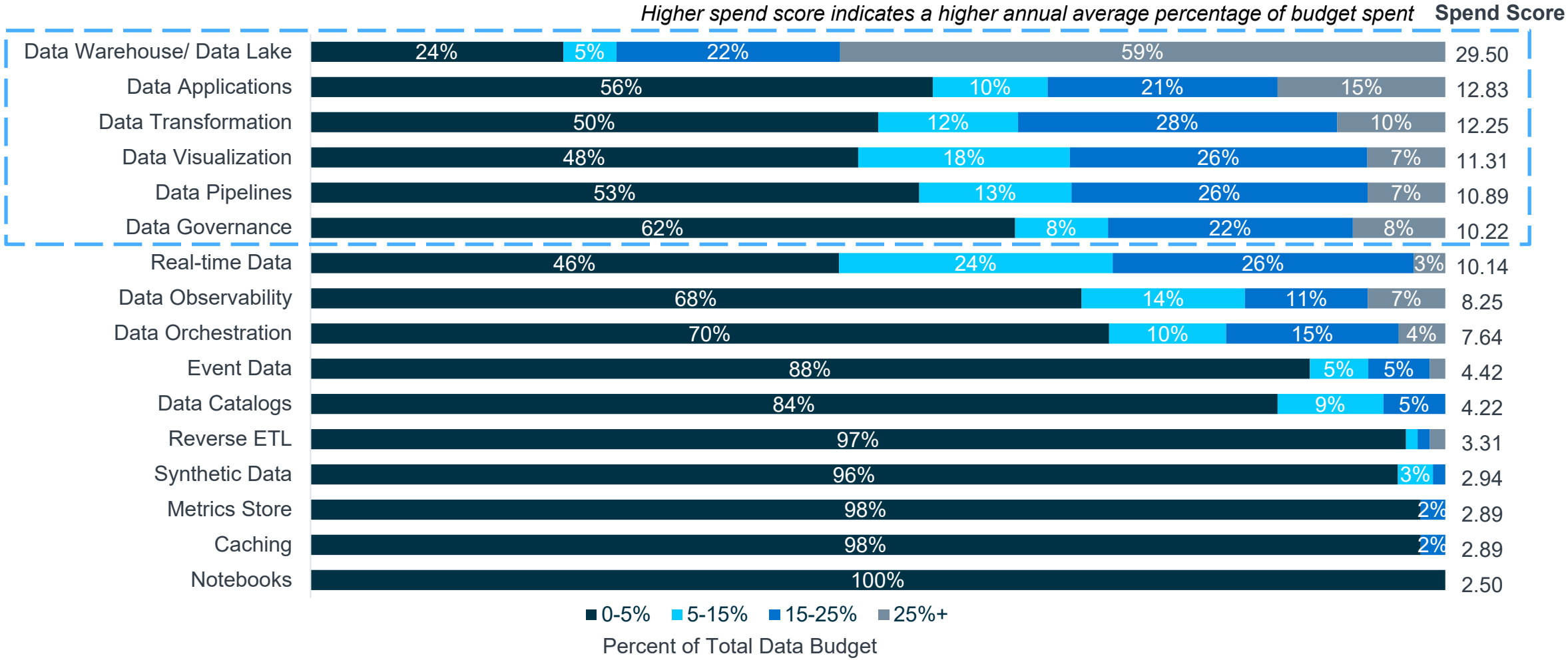
Companies Ranking Their Top 5 Priorities Within Data



Core pieces of the modern data stack – warehouse, visualization and transformation – remain strong. Governance has risen to the top relative to Q3 2022, likely due to increased interest in leveraging AI.

Source: Battery Q1 2023 Cloud Software Spending Survey

Data Budget Allocation Across Categories



Data warehouse has the highest spend score by far, serving as the center of the modern data stack. As companies get a better handle on data, budgets will move down the stack toward operationalizing data.

Source: Battery Q1 2023 Cloud Software Spending Survey
Note: Spend score is calculated as the weighted average of the provided range midpoint e.g., 5% for the 1-10% spend category; respondents that did not input a number are not reflected as 0% in the graph.

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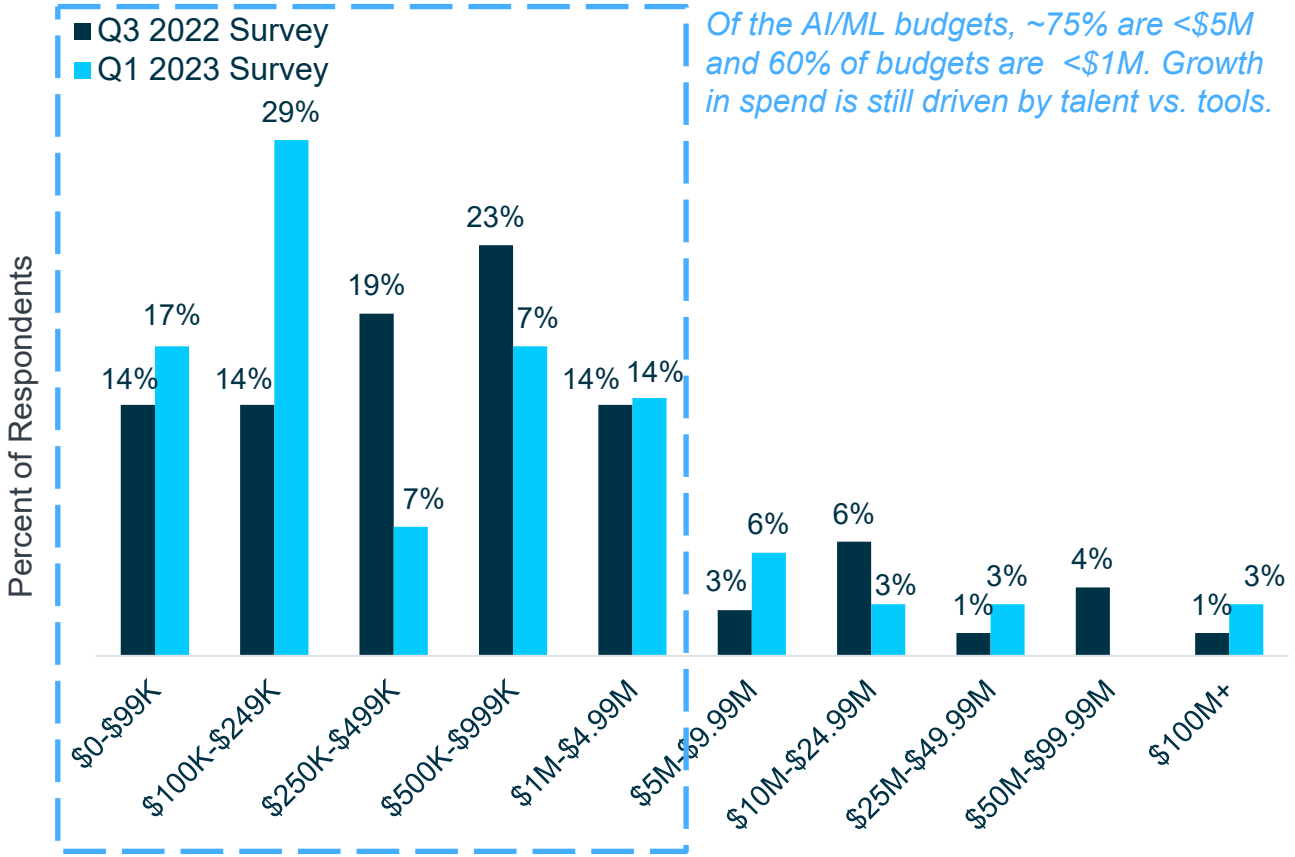
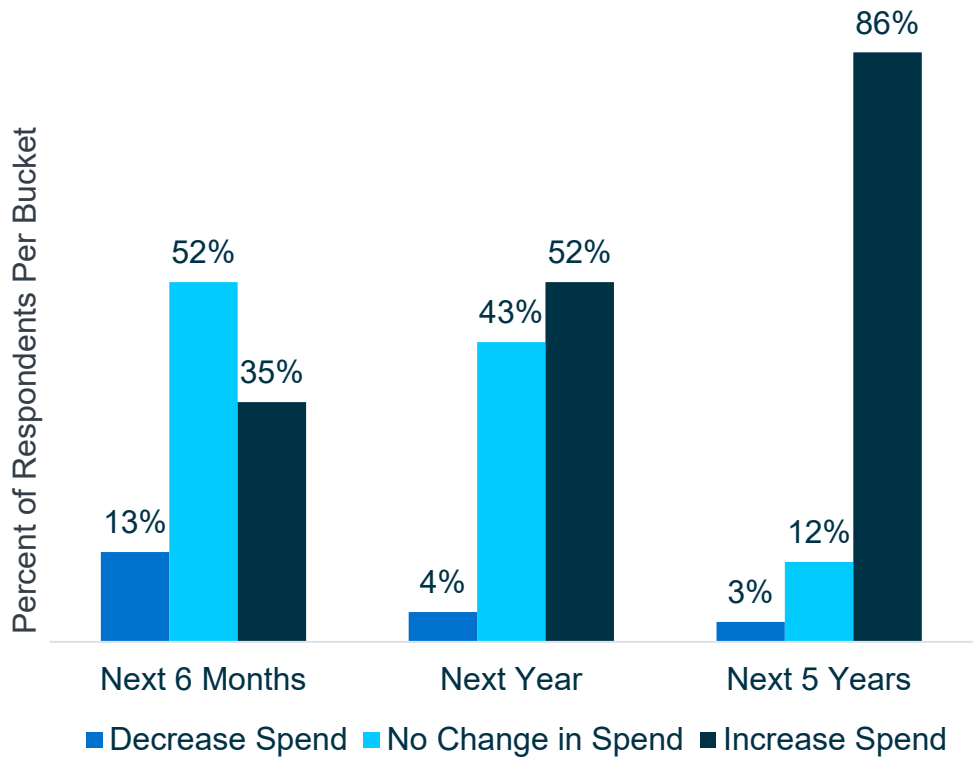
Appendix:
AI and ML Budget

Total Budget Size and Expected Spending Change for AI and ML Vendors



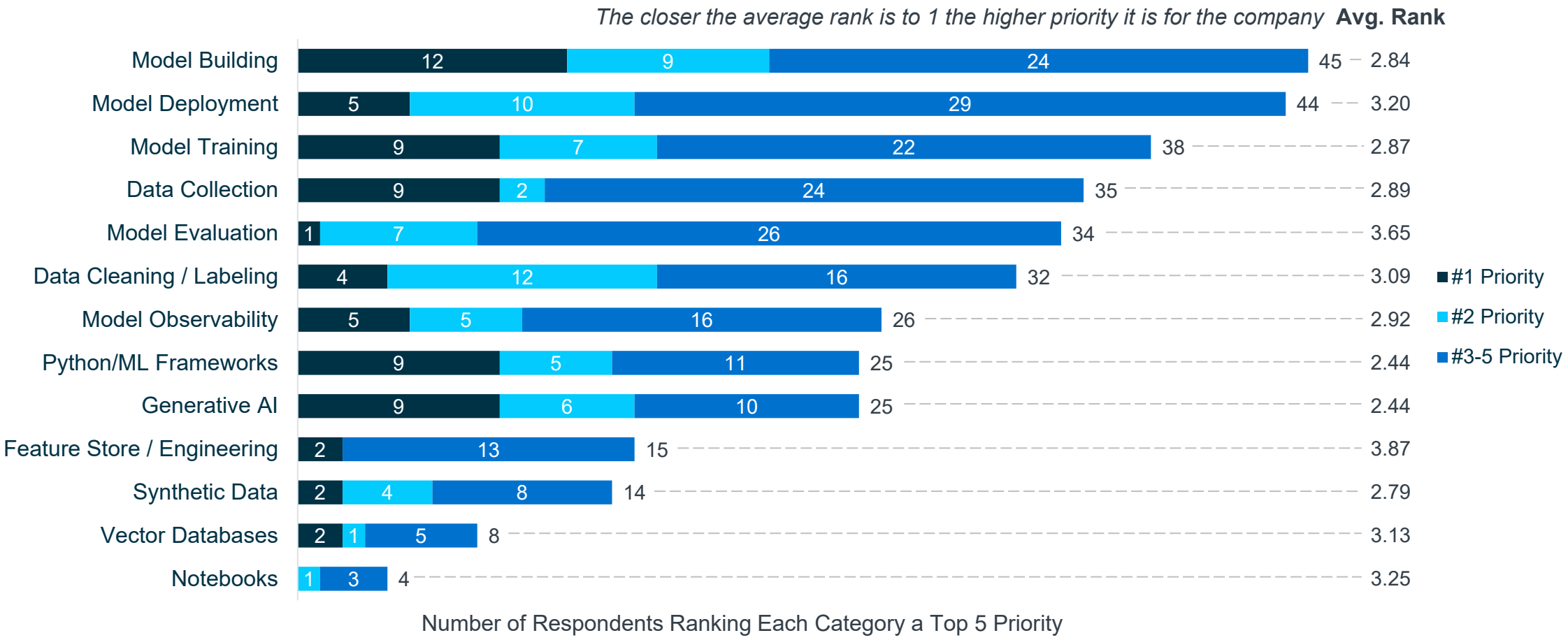
Of the AI/ML budgets, ~75% are <$5M and 60% of budgets are <$1M. Growth in spend is still driven by talent vs. tools.



Market is still early with most budgets still below $1M, but 86% of CXOs plan to grow AI and ML budgets in the next 5 years.

Source: Battery Q1 2023 Cloud Software Spending Survey

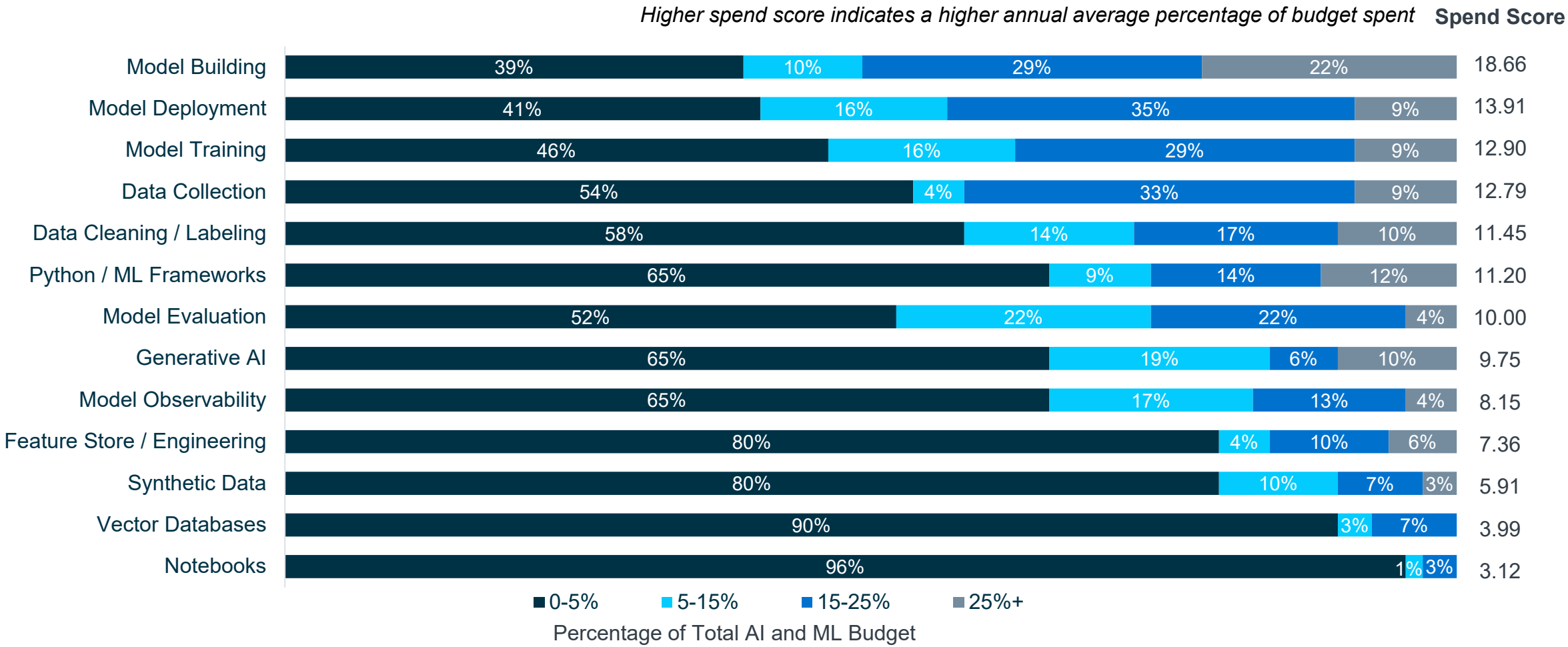
Companies Ranking Their Top 5 Priorities Within AI and ML Tools



AI and ML core infrastructure is currently a top priority as many companies continue to begin their journey with model building, data cleaning and data collection.

Source: Battery Q1 2023 Cloud Software Spending Survey

AI and ML Tool Budget Allocation Across Categories



The highest spend score is found in core ML infrastructure that helps companies start their machine learning journey, e.g., data collection, cleaning and labeling.

Source: Battery Q1 2023 Cloud Software Spending Survey
Note: Spend score is calculated as the weighted average of the provided range midpoint e.g., 5% for the 1-10% spend category.

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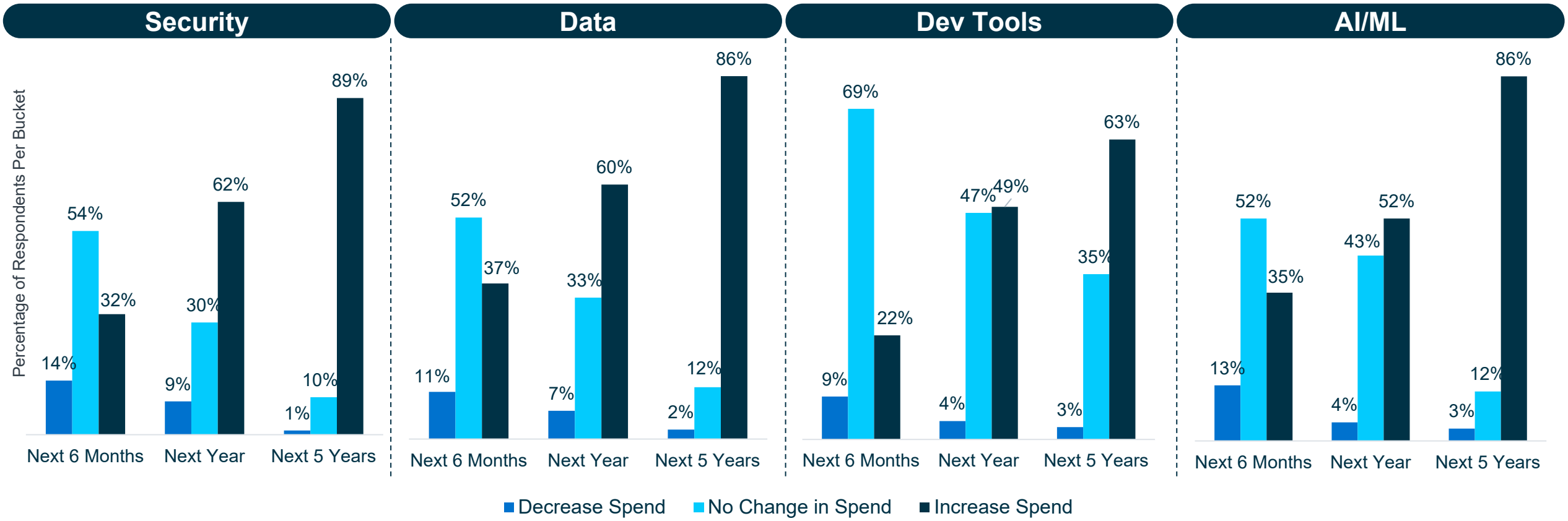
Appendix: Budget Change Across Key Categories

Expected Cloud Software Spending Change by Category



Less than 15% of CXOs are looking to decrease budget across four core categories; some slowdown relative to less than 10% in Q3 2022 Battery Survey.

Source: Battery Q1 2023 Cloud Software Spending Survey