



ESG WHITE PAPER

The Impact of Collaboration Quality on Data Science Success

Accelerating Data-centric Initiatives with Cisco

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Prioritizing Data Science and IT Collaboration to Fuel Better Business Outcomes

Organizations are prioritizing initiatives to drive more value from data. They are investing in people, technology, and processes to help with data discovery and analysis. They are hoping to take actionable insights and rapidly apply them to the business. They're turning to advanced data analytics, artificial intelligence (AI), and machine learning (ML) to revolutionize their business. And while investments grow, the people problem is proving to be the most difficult obstacle to overcome. And that problem is becoming less about not having a data science team or data scientists, and more about a greater need for collaboration. To ensure success in achieving data-centric goals, the business must be in lockstep—from the top with executives, down through lines of business, to data science teams, developers, and IT.

With a goal of better understanding how collaboration across the business impacts data-centric initiatives, ESG recently performed research to:

- Measure the general IT and data science backdrop at organizations today.
- Uncover meaningful discrepancies in how data science professionals and IT operations professionals view the status of data science initiatives.
- Identify the impact collaboration has on an organization's data science-related projects and initiatives.

The research consisted of a survey of 200 line-of-business professionals with data-centric titles and IT management professionals with purchasing responsibility for their organization's advanced analytics environment. Respondents were based in North America (US and Canada) and employed at organizations with 500 or more employees across a broad cross-section of industries, such as technology, financial services, manufacturing, business services, and education.

Key Findings

More than three-quarters (78%) of surveyed midmarket and enterprise organizations have a formal data science team. Of those organizations, the findings show that the level of collaboration between data science and IT teams has a direct impact on business outcomes. While skill scarcity continues to be a top challenge for IT, the pace of change driven by data science teams exacerbates contention with IT teams. Collectively, most organizations believe data science initiatives are effective at driving value, but those organizations that are deemed as high-quality collaborators have a significant advantage over those lacking collaboration across the lifecycle of data science initiatives. From better effectiveness at driving value and improving decision making, to enhancing the customer experience, the more collaboration between data science and IT, the better the business results.



The business advantage of high-quality collaboration between data science and IT

High-quality collaborators are **4.2x** likelier to be very effective at **driving value** to their organizations.

88% of high-quality collaborators show **improvements to their customer experience** due to data science initiatives.

87% of high-quality collaborators have **improved their business decision-making process** due to data science initiatives.

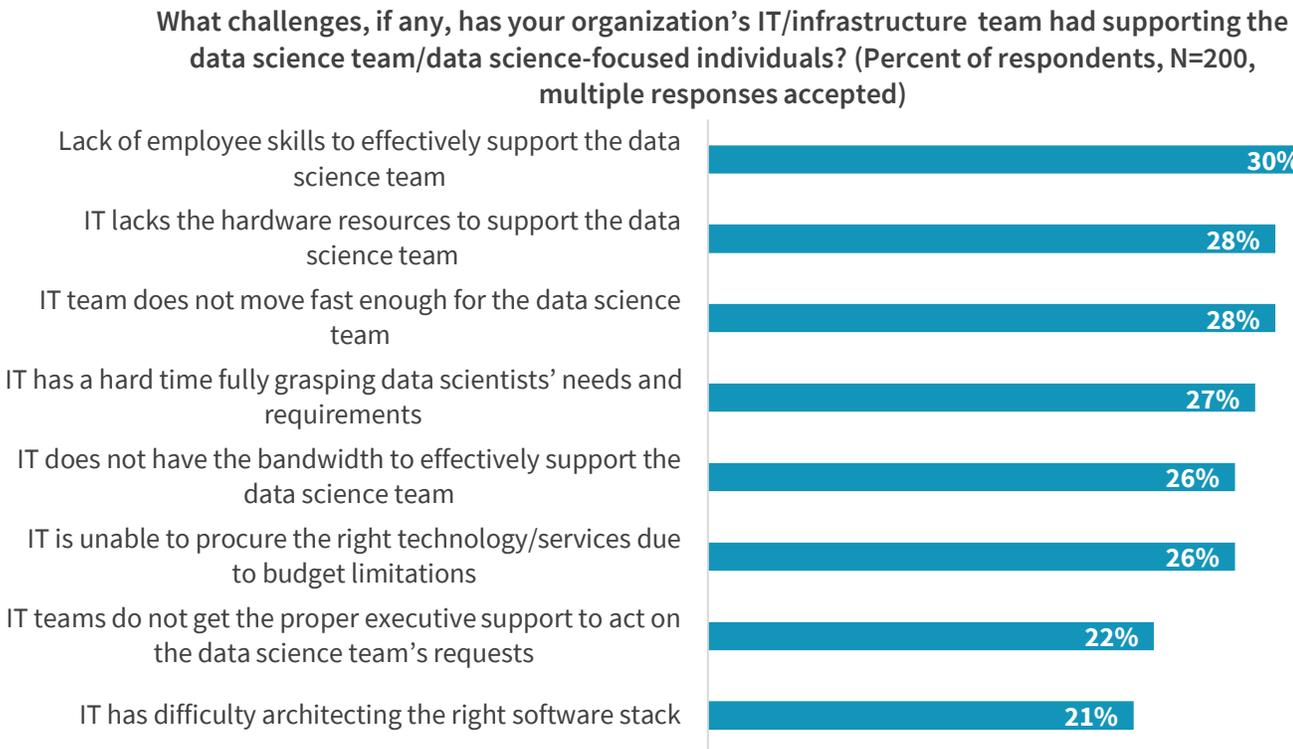
The Data Science Landscape

For data-driven organizations, data science has become essential. In fact, 86% of surveyed organizations began working on data science projects and initiatives a year or more ago, with 46% having established initiatives three or more years ago. This is important to highlight as the primary respondent base has already invested heavily in data science and recognizes the value and impact data can have on the business through projects that utilize AI and ML. ESG sought to understand how IT and data science teams worked together with a goal of achieving data-driven success.

How Is IT Doing?

When asked how IT does at satisfying data science team requests, 60% of all respondents said there is room for improvement. And unsurprisingly, IT was more likely to give themselves high marks (48% said IT does a great job versus just 29% of non-IT, data-centric respondents). But who is at fault for the breakdown in collaboration and communication? The research found that when a problem arises in the communication between data science and IT, IT is considered most at fault, and interestingly, IT is admitting this more than anyone else. Figure 1 highlights the top challenges organizations' IT teams have in supporting data science requests. Skills gaps, infrastructure shortcomings/limitations, and lack of agility prove to hinder IT teams more than anything else.

Figure 1. Top IT Challenges in Supporting Data Science Teams



Source: Enterprise Strategy Group

Where Are Data Teams at Fault?

It's important to note that while IT has a way to go in better supporting data science requests, data science teams have their own shortcomings that prove to be tricky to overcome. When asked how accurately and effectively the organization's data science team/data science-focused individuals were at sharing



40%

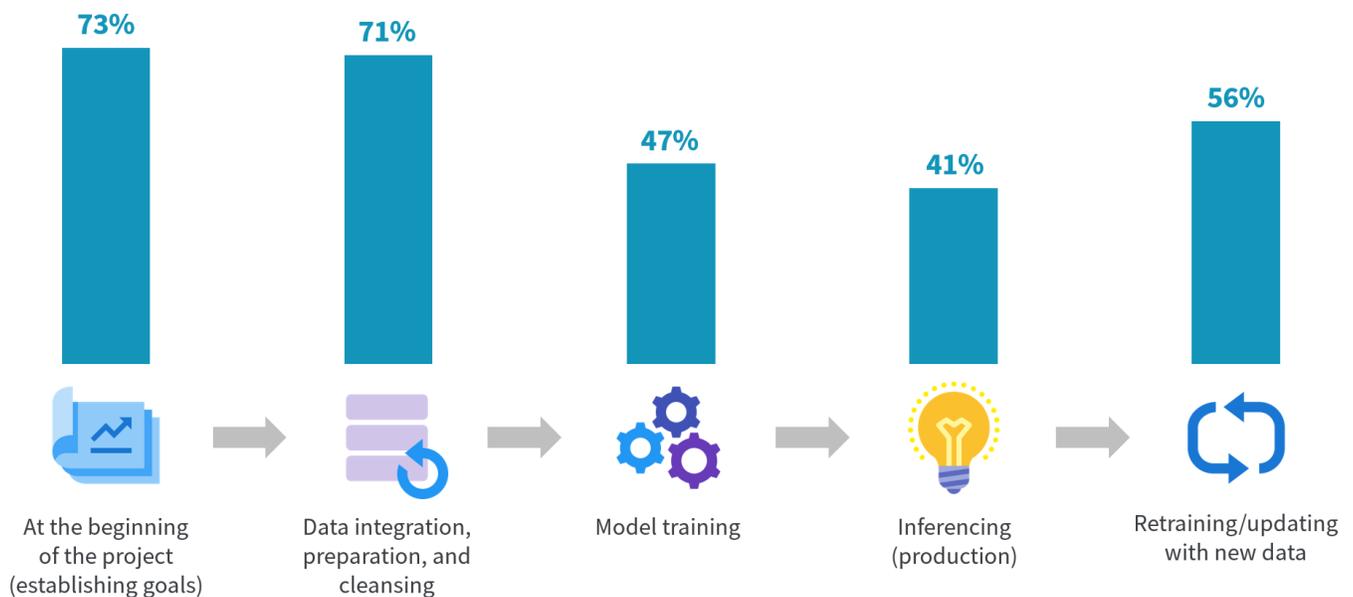
of organizations say the greatest challenge impacting a better partnership between data science and IT teams is the data science team rapidly changing priorities.

requirements with the IT/infrastructure team, 57% said there is room for improvement. And while that can be partially attributed to the dynamic nature of data, the top challenge impacting a better partnership between data science and IT is rapidly changing priorities, with 40% of organizations saying as such.

Establishing High-quality Collaboration and What It Means to the Business

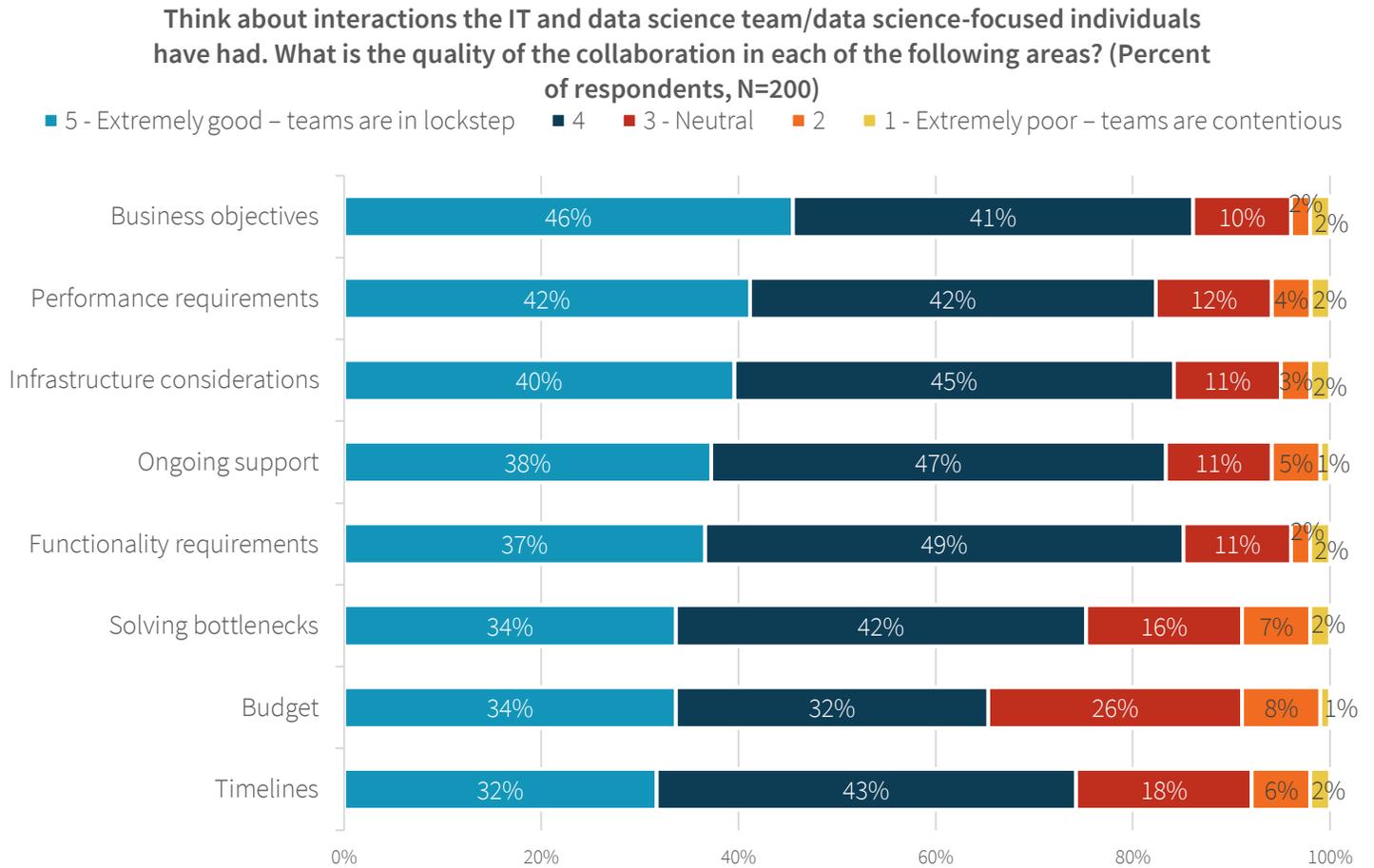
When looking to measure how organizations collaborate, ESG established common phases of a data science project. This included: starting off projects and establishing collective business goals; collecting, integrating, and cleansing relevant data; modeling and training; deploying models and inferencing; and retraining models based on data drift or different data goals/priorities. ESG asked respondents to select the different phases/areas where IT and data science collaborate. The research found that at the start of projects and during data integration and data cleaning stages, over 70% of organizations state their data science and IT teams collaborate. But after that handoff, collaboration falls off significantly. During phases that involve model training or inferencing, less than 50% of organizations continue collaboration between data science and IT. This is a significant gap since inferencing is likely to require IT’s help with application and model deployments.

In which of the following stages of the typical data science project do the IT/infrastructure team and the data science team/data science-focused individuals at your organization collaborate?



Respondents were then asked to rate the quality of the collaboration between IT and data science teams in 8 areas on a 5-point scale with those different phases in mind. Respondents rating the quality of collaboration as at least a 4 out of 5 in all 8 areas were considered to have high-quality collaboration. All other respondents were considered to be employed at low-quality collaboration organizations. Figure 2 highlights the results. And while two-thirds of organizations can meaningfully improve collaboration when it comes to areas specific to solving bottlenecks, budgets, and timelines, when comparing high-quality collaborators to low-quality collaborators, several dramatic differences became apparent.

Figure 2. Ranking Quality of Collaboration



Source: Enterprise Strategy Group

While 85% of organizations believe data science initiatives are effective at driving some level of value, the level of collaboration impacts the effectiveness. Organizations with high-quality collaboration are 4.2x more likely than those with low-quality collaboration to be very effective at driving value to their organizations. 88% of organizations with high-quality collaboration improved their customer experience due to their data science initiative (versus 65% for low-quality collaboration). 87% of high-quality collaboration orgs improved their business decision making process due to their data science initiative (versus 69% for low-quality collaboration).

Respondents are also generally positive about future improvements, as 56% of organizations represented expect to improve the accuracy and quality of business decisions over the next 12 months through their data science initiatives.

Use Cases and Collaboration Effectiveness

In addition to affecting business value, a data science team can support many facets of the business. This includes using data science in association with cybersecurity effectiveness, personalized marketing, internal process improvement /operational efficiency, product development, and prospect segmentation. ESG asked respondents if their organizations are bringing data science to bear in these ways and, if so, what the impact has been relative to expectations. ESG observed a significant difference in those organizations that have high-quality collaboration across IT and data science teams. For

example, when compared with low-quality collaboration organizations, high-quality collaboration organizations are 2.9x likelier to say the benefit of data science projects to cybersecurity effectiveness was bigger than expected.

High-quality collaborators are much likelier to achieve greater than expected benefits from data science projects

WHEN COMPARED TO LOW-QUALITY COLLABORATORS



Another way to highlight the value of collaboration is to segment respondents in a different way and look for similar trends. For example, looking at the same use case, ESG cut the data by the number of years an organization has had an established data science team. The findings further highlighted the value of collaboration: Whether just starting out with data science or having leveraged data science teams for over 3 years, time committed to data science had minimal to no impact on outcomes relative to expectations. For example, in terms of cybersecurity effectiveness, 47% of organizations with less than 3 years of data science experience outstrip expectations when it comes to improving cybersecurity. For those organization with 3 years or more of data science experience, 46% see that same level of success relative to expectations. Collaboration proves to be far more important to an organization’s ability to overachieve on their data science goals than the length of time initiatives have been underway.

Measuring Business Success

It’s important to understand how organizations and different roles within them measure the success of data science initiatives. Today, in terms of metrics used to measure data science initiative success, performance remains king, followed by custom metrics for the business (KPIs), volume of data analyzed, and responsiveness to business questions or requests. Organizations with data science initiatives underway are definitively seeing results; they are:

- 4x likelier than not to have improved business decision making processes.
- 3.4x likelier than not to have improved customer experience/satisfaction.
- 2.9x likelier than not to have improved quality of products/services delivered.
- 2.8x likelier than not to have improved innovation.

The interesting component is to understand the magnitude of benefits and how it differs between high-quality collaboration organizations and low-quality collaborators. On average, organizations with high-quality collaboration achieved greater business benefits faster than those with low-quality collaboration. For example, high-quality collaborators have improved customer retention by 32% (on average) through their data science projects compared to a 22% improvement (on average) for low-quality collaborators. Additional examples can be found in Figure 3.

Financial Outcomes and Investments

While data science initiatives have led to numerous business benefits, understanding the way business benefits impact the top line results of businesses (i.e., increased revenue) is critical. At a high level, the research shows that 75% of organizations have increased revenue due to their data science initiatives. This is regardless of level of collaboration. With that said, high-quality collaboration has a positive impact. 88% of high-quality collaborators see increases in revenue as a direct result of data science initiatives versus 64% of low-quality collaborators. But to what extent are the sizes of those revenue increases directly attributable to data science initiatives?

ESG asked organizations to think about their company’s current fiscal year (FY) and estimate roughly what percentage of the organization’s revenue is believed to be directly tied to its data science initiatives. On average, data science initiatives directly account for 10% of organizations’ overall revenue. The data point that stood out to ESG is how collaboration is correlated to revenue. Organizations with high-quality collaboration say 13% of their overall revenue directly ties to data science initiatives, nearly double that of low-quality collaborators. And it’s important to note that the revenue is proving to be mostly incremental, with 88% reporting half or more of their revenue from data science initiatives is incremental.



Organizations with high-quality collaboration have an average of 13% of their overall revenue directly attributed to data science initiatives, nearly double that of low-quality collaborators (7%).

These financial benefits are making it easier for organizations to justify investments in people, technology, and processes to advance existing or begin new data science initiatives. In fact, just 2% of organizations expect spending on data science to decline over the next 12 months. And for the 72% of organizations increasing spending, the average increase in spending is ~35%. The discrepancies in these areas between high-quality and low-quality collaborators are stark. High-quality collaborators not only plan to increase spending, but to do so at a greater clip than low-quality collaborators. 79% of organizations with high-quality collaboration expect to increase their spending on data science initiatives over the next 12 months, and the amount they plan to increase that spending is ~44%. This is significant when compared with low-quality collaborators, with 66% expecting to increase spending, and the amount they plan to increase spending is just ~26%.

Figure 3. High-quality Collaborators Are Achieving Greater Business Benefits Faster

HIGH-QUALITY COLLABORATORS		LOW-QUALITY COLLABORATORS
32%	Average improvement in customer retention	22%
31%	Average increase in the speed of decision making	21%
28%	Average cost reduction	21%
28%	Average reduction in product defects/premature failures	20%

Source: Enterprise Strategy Group

Cisco Can Help

Understanding the challenges organizations face today when it comes to collaboration, Cisco is positioning itself as a key facilitator of more effective collaboration across business-centric, data-centric, and IT-centric personnel.

Cisco works closely with line-of-business and data science teams from start to finish, understanding specific analytics use cases and helping align business goals with the right short- and long-term architectures. Understanding flexibility and agility matter when it comes to supporting data-driven initiatives, Cisco regularly advises and assists in designing an optimal infrastructure that enables rapid deployments from prototype to production-scale environments.

With IT, Cisco is a proven and trusted advisor, enabling more productive conversations with data science and LOB teams with the infrastructure in mind. That means identifying the right architecture and infrastructure that meets IT's corporate standards, as well as optimal approaches to ensure the right amount of valuable resources are available when needed. It should be noted that Cisco understands that it's more than hardware. It's about data accessibility, orchestration, and management across environments, whether on-premises, off-premises, or a hybrid of the two. Cisco brings an end-to-end approach that includes data collection and data analytics at the edge, secure data networking, and access to right-sized compute where the data resides.

For more information on how Cisco can bridge the gap between data science teams and IT teams, visit [Cisco's website](#).

The Bigger Truth

Organizations' pursuit of a data-centric culture starts with people. Whether defining business-wide objectives, establishing application requirements, deploying technology, or ensuring optimal workflows and processes, everyone must be in lockstep to maximize a positive return on investment in next-generation technologies like AI and ML. And that means putting a focus on collaboration throughout the business.

Effective communication and collaboration between key personnel throughout the AI lifecycle, from establishing AI initiatives to measuring AI success, has been proven by ESG research to serve as a key differentiator. For data science teams and IT teams, those organizations with higher levels of collaboration achieve greater business success faster. They more effectively deliver personalized experiences to customers, improve business processes and operations, and reduce risk throughout the business. They improve business decision making, customer experience/satisfaction, and quality of products. And putting it all together, they have a direct impact on the bottom line by ensuring higher levels of profitability with more revenue directly attributable to data-centric initiatives.

Appendix: Research Methodology and Respondent Demographics

To gather data for this report, ESG conducted a comprehensive online survey of LOB management and IT management from private- and public-sector organizations in North America (US and Canada). The survey was fielded between January 21, 2020 and February 04, 2020.

To qualify for this survey, respondents were required to have data-centric titles or purchase responsibility for their organization’s analytic environment.

After filtering out unqualified respondents, removing duplicate responses, and screening the remaining completed responses (on several criteria) for data integrity, a final sample of 200 respondents remained.

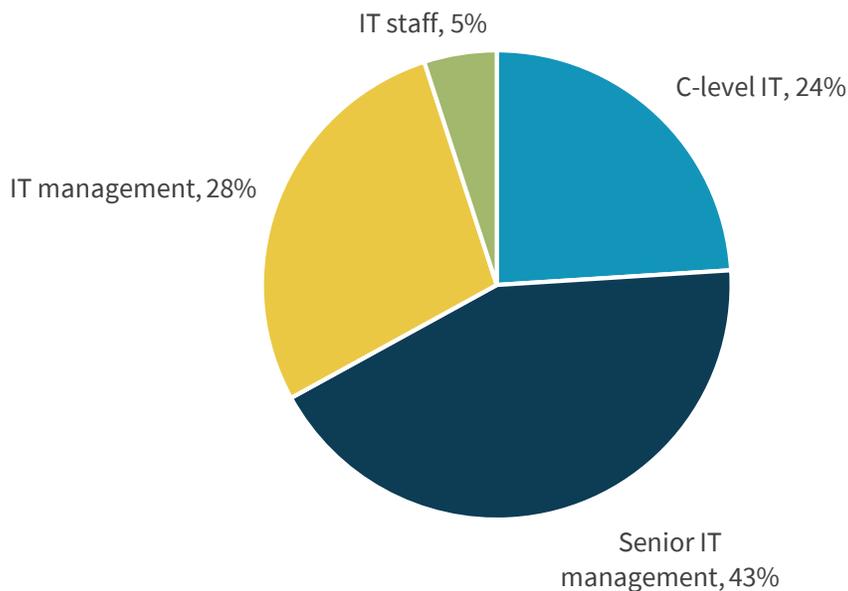
All respondents were provided an incentive to complete the survey in the form of cash awards and/or cash equivalents.

Note: Totals in figures and tables throughout this report may not add up to 100% due to rounding.

The figures below detail the demographics of the respondent base: individual respondents’ current job responsibilities, as well as respondent organizations’ total number of employees, primary industry, and annual revenue.

Figure 4. Survey Respondents, by IT Job Responsibility

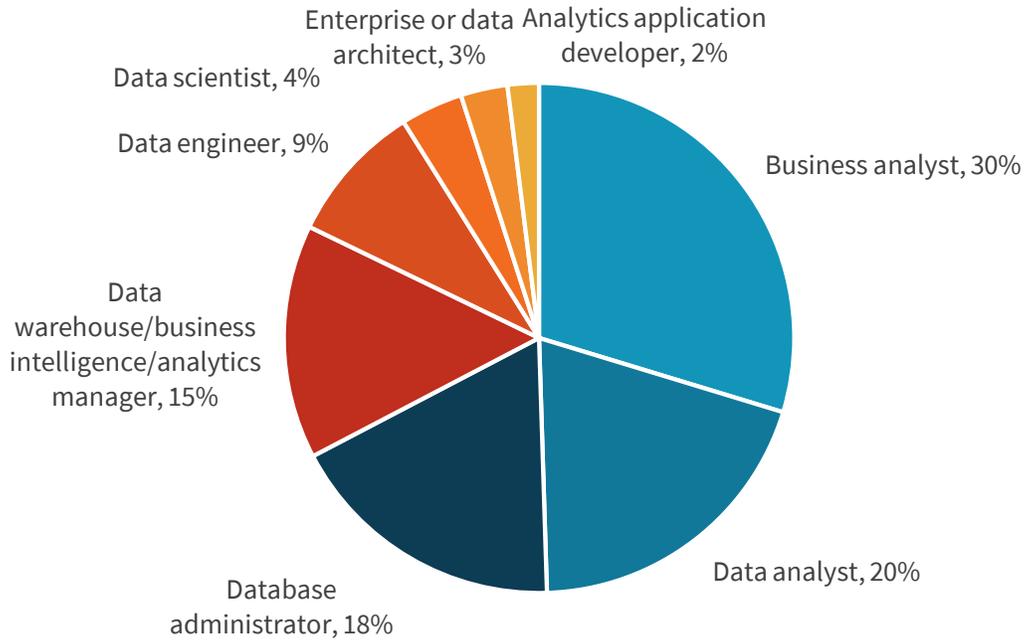
Which of the following best describes your current responsibility within your company?
(Percent of respondents, N=98)



Source: Enterprise Strategy Group

Figure 5. Survey Respondents, by Data-centric Job Responsibility

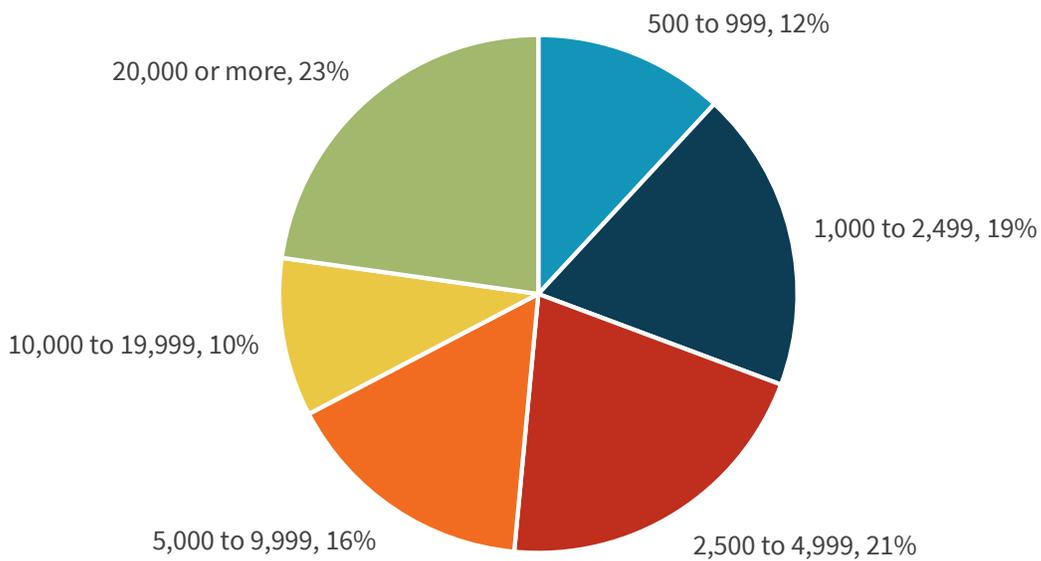
Which of the following best describes your data-centric role? (Percent of respondents, N=102)



Source: Enterprise Strategy Group

Figure 6. Survey Respondents, by Company Size (Number of Employees)

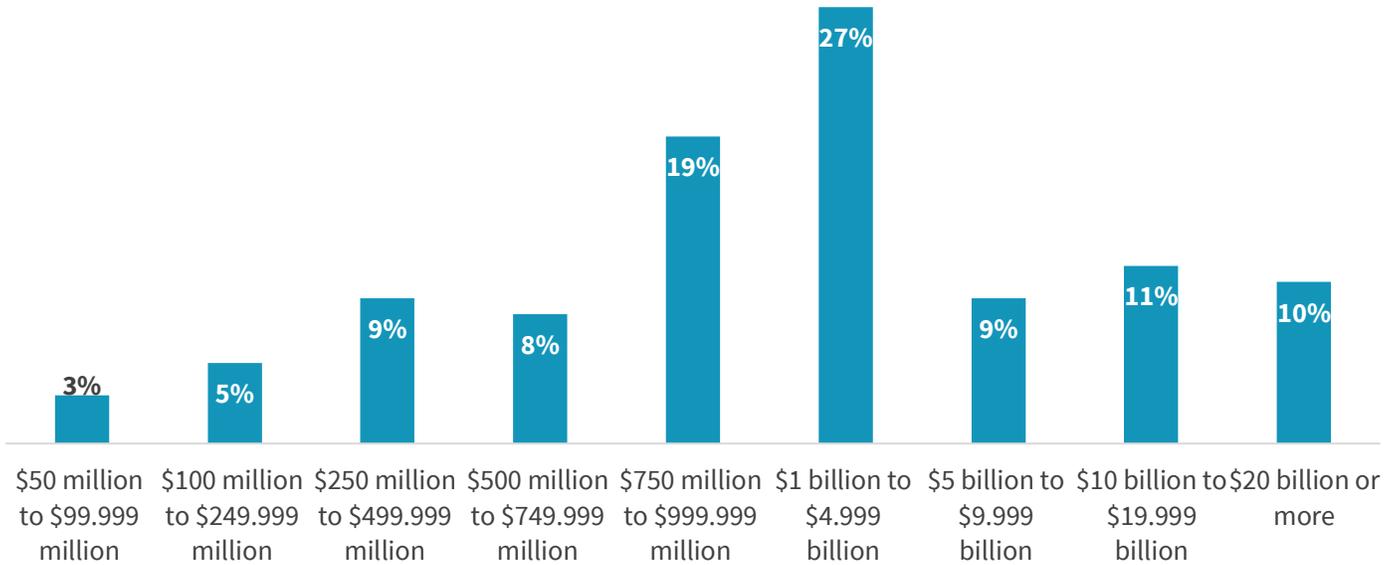
How many total employees does your company have worldwide? (Percent of respondents, N=200)



Source: Enterprise Strategy Group

Figure 7. Survey Respondents, Company Size (Revenue)

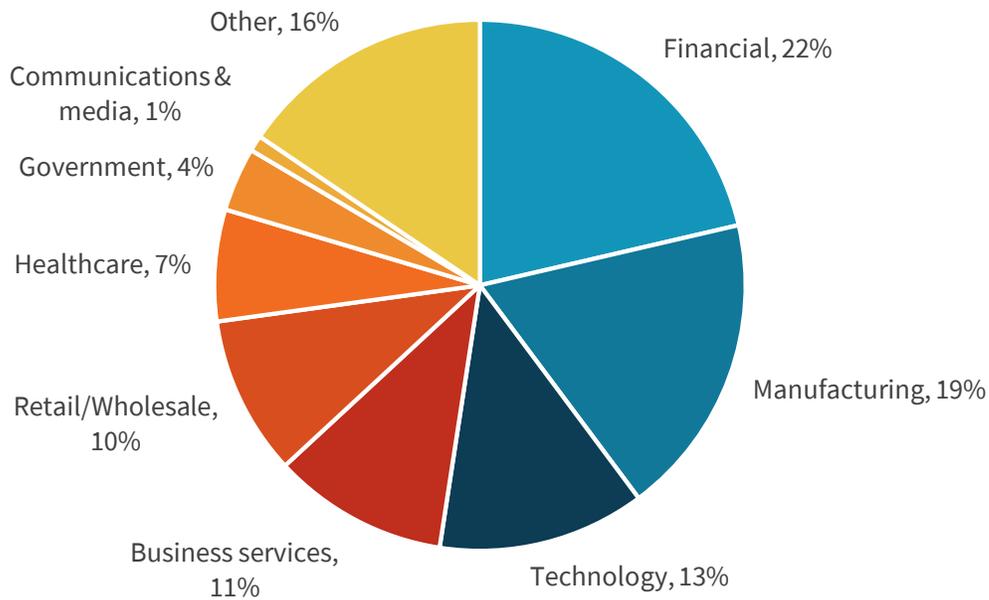
What is your company's total annual revenue (\$US)? (Percent of respondents, N=200)



Source: Enterprise Strategy Group

Figure 8. Survey Respondents, by Industry

What is your company's primary industry? (Percent of respondents, N=200)



Source: Enterprise Strategy Group

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