Research Insight Paper

Measuring the Value of Data and Analytics Inside Modernized IT Departments

Research-Based Insights into How Organizations Unlock the Value of Data with Modern IT Infrastructure

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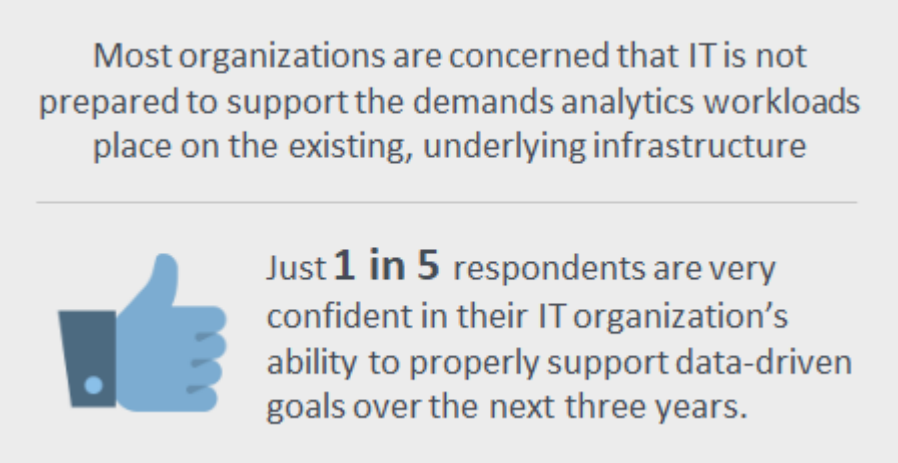
The Impact of Data-Driven Initiatives on IT

In today's dynamic business environment, organizations are turning to data more than ever to help them transform. Data-driven initiatives that leverage next-generation applications and analytics are being deployed across organizations to support various operations and lines of business, but underlying IT challenges remain. Too often, infrastructure and operations teams are tasked with supporting these next-gen compute and storage intensive workloads with legacy infrastructure. The data show this can be detrimental to achieving business goals and maintaining competitiveness.

It's clear that data and analytics are accelerating digital transformation, and it's having a big impact on businesses. However, most organizations are concerned that IT is not prepared to support the demands these workloads place on the existing, underlying infrastructure. In fact, when IT professionals were asked about their level of confidence in the ability of their IT organizations to support the data-driven goals of the business over the next three years, only one in five respondents (20%) stated they are very confident.



This is forcing organizations to take a step back and make changes to the infrastructure first, before pursuing their data-centric goals. An integral part of this process is IT modernization—leveraging an agile, scalable infrastructure that can quickly be deployed, predictably scale, boost security, simplify operations, and support next-generation workloads. These infrastructures not only enable IT to be more productive, but also can help accelerate data-driven initiatives.

Further driving the need to modernize the underlying infrastructure is that data is stored, processed, analyzed, and backed up in various locations including core data centers, edge locations, and the cloud. While the locations where data tasks are performed are only expected to change slightly over the next few years, what *is* expected to change is how data will be managed and analyzed.

To properly support a new approach to data management and analytics, IT modernization must occur to effectively meet the real-time needs of the business. Organizations will still rely on three-tier architecture (i.e., disaggregated servers, storage, and SAN to run applications developed and maintained as autonomous modules on individual platforms), but to fully meet the needs of next-generation workloads, organizations are looking to augment their existing infrastructure with converged and hyperconverged infrastructures.

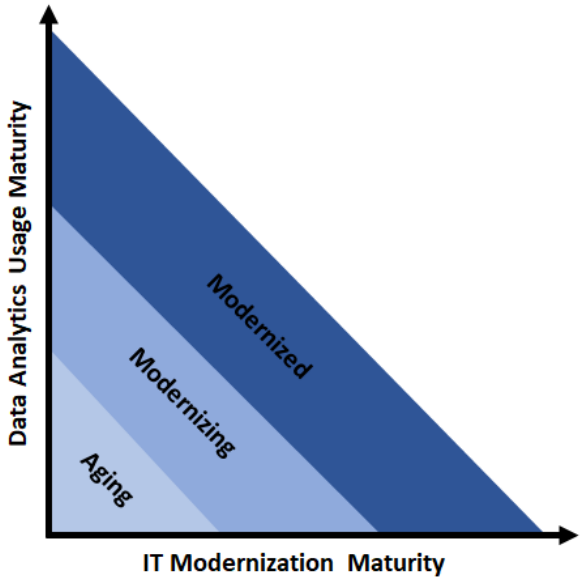
The Correlation of IT Modernization and Effectively Utilizing Data

Modernizing IT infrastructure is essential for organizations to ensure their systems are ready to support an overarching digital transformation, while reaping the benefits of data management and analytics initiatives. A modernized IT allows organizations to swiftly respond to the needs of the business, act upon opportunities in real time, maintain a competitive advantage, and ultimately improve the bottom line. While the thought of IT modernization may be daunting to those accustomed to working within a more traditional three-tier infrastructure, organizations that have already undergone an IT modernization are probably wondering why it took them so long to make the change.

Calculating the Advantages of Modernized IT

ESG recently executed research to better understand and quantify the relationship between IT modernization and data-centric analytics workloads. The research consisted of a survey of 501 IT decision makers who are knowledgeable of their organization's analytics environment. Respondents were distributed across the globe: 60% of respondents resided in North America with the remainder split evenly across Western Europe and the Asia-Pacific region. As part of the research into the relationship between data and analytics and IT modernization, ESG leveraged an established IT modernization maturity framework that enabled ESG to group respondents into infrastructure modernization categories based on their environment and processes. From an infrastructure perspective, organizations that leverage highly automated server management tools, are mostly virtualized, utilize all-flash storage, deploy converged and hyperconverged systems more pervasively, and apply data protection technologies holistically across their entire environment, were ascribed more maturity points in the framework.

From a process perspective, organizations prioritizing technologies that leverage software-defined principles, enable infrastructure automation, and deliver on the promise of self-service infrastructure provisioning were ascribed more maturity points. In total, a respondent's IT organization could earn a maximum of 78 maturity points. Those that earned 25 points or less (10% of respondents) were categorized as *Aging*; those that earned between 25.5 and 50 points (58% of respondents) were categorized as *Modernizing*; and those that earned more than 50 points (32% of respondents) were rated as *Modernized*.



Using this framework[1], ESG was able to assess the relationship between IT modernization maturity and other aspects of organizations' IT environments. Organizations with *Modernized* IT:

- **Can analyze more of their data:** On average, organizations with *Modernized* IT reported **32% more** of their organization's data is usable within their analytics environment compared to organizations with *Aging* IT (62% versus 47%). Organizations with *Modernized* IT are **6x more likely** to use sensor or machine data in analytics environments, and **more than 2x as likely** to use video/image data in analytics environments compared to organizations with *Aging* IT.

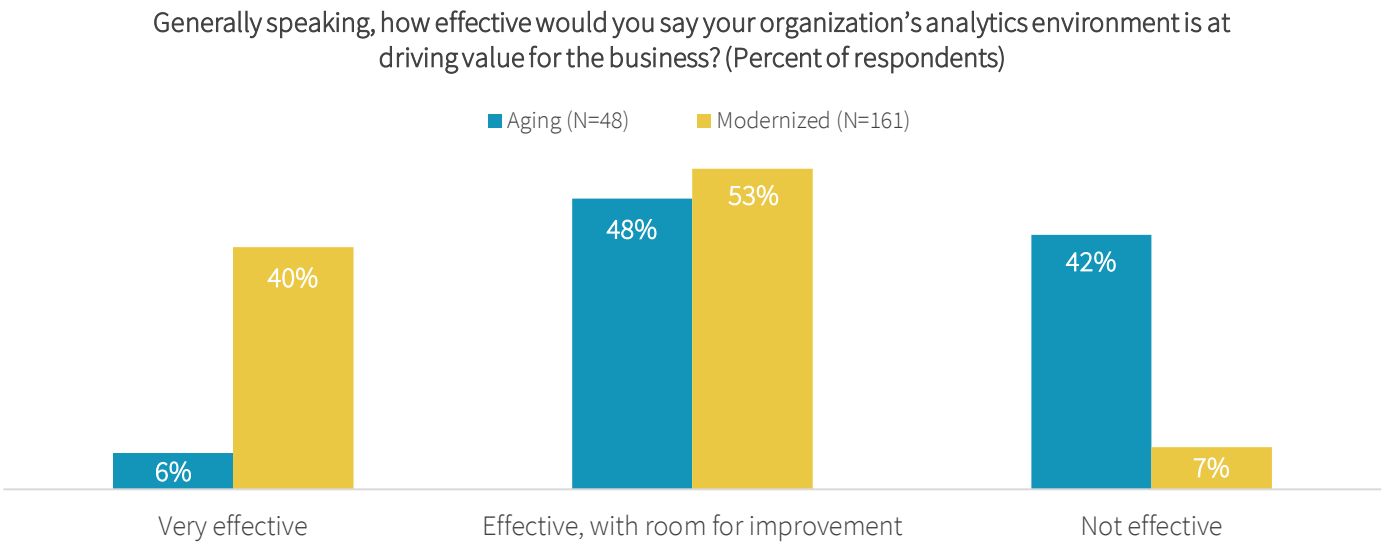
- **Prioritize data access:** Organizations with *Modernized* IT were nearly **3x more likely** than organizations with *Aging* IT to report their organization's philosophy is to make data and analytics available to all or most employees (72% versus 25%).

Modernized IT organizations are also achieving dramatically different analytics outcomes:

- **Drive value:** Correlated to the use of modern infrastructure, organizations with *Modernized* IT are nearly **7x more likely** than organizations with *Aging* IT to report their analytics environment are very effective at driving business value (see Figure 1).

[1]Please see *Appendix II – Criteria for Evaluating Organizations' IT Modernization* for full details.

Figure 1. Effectiveness at Driving Value for the Business



Source: Enterprise Strategy Group

- **More likely to drive specific business benefits:** Organizations with *Modernized* IT were more likely than organizations with *Aging* IT to report their analytics environment is helping them achieve a host of outcomes:
  - Organizations with *Modernized* IT were **3.6x more likely** than organizations with *Aging* IT to report analytics are increasing customer spend by identifying more upsell, cross-sell, and deep-sell opportunities (62% versus 17%).
  - Organizations with *Modernized* IT reported analytics are reducing the cost of business operations at **nearly triple the rate** of those with *Aging* IT (60% versus 21%).
  - Organizations with *Modernized* IT were **more than twice as likely** as organizations with *Aging* IT to report analytics have helped minimize the risk of noncompliance (58% versus 23%).
  - Organizations with *Modernized* IT were **3.5x more likely** than organizations with *Aging* IT to report analytics are helping uncover new market opportunities (53% versus 15%).
  - Organizations that reported analytics are shortening time to market for products and/or services were **nearly three times more common** among the *Modernized* cohort of organizations versus the *Aging* cohort (52% vs. 19%).
- **Outperform competitors:** Organizations supported by mature IT and actionable analytics were much more likely to report outperforming their competition across a broad spectrum of business functions:
  - The frequency with which respondents at organizations in the *Modernized* segment classified their research and development function as market leading was **433% higher** than the frequency observed among respondents at organizations with *Aging* IT (48% versus 9%).
  - Organizations with *Modernized* IT were **5.1x more likely** than organizations with *Aging* IT to describe their sales and marketing capabilities as market leading (46% versus 9%).
  - Organizations with *Modernized* IT reported their ability to manage risk was market leading at nearly **five times the rate** of their counterparts with *Aging* IT (42% versus 9%).

Leveraging Data for Better Business Outcomes

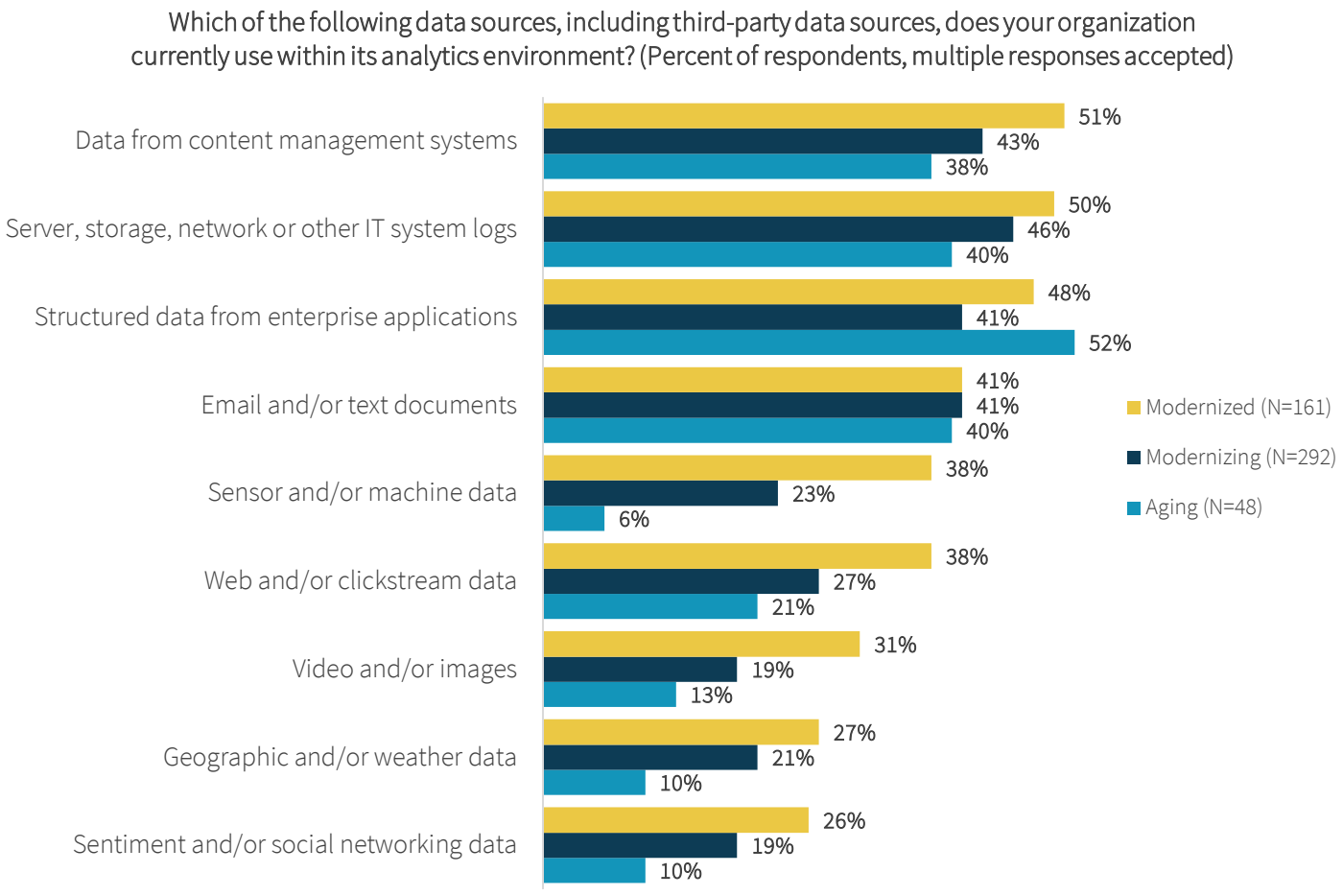
Organizations collect massive amounts of data, every second of every minute of every day. As these organizations modernize their infrastructures to support next-level scalability requirements and transform their operational workflows based on the sheer scale of these massive data sets, they quickly realize that simply *collecting* data doesn't deliver business value. At times, collecting data is not even possible. Even when organizations can collect data, it doesn't mean they can use it. ESG research shows a plurality of *Aging* IT (41%) report less than 40% of all their data is usable within their analytics environment; however, the majority of *Modernized* IT (55%) report that more than 60% of their data is usable. This shows a direct correlation between leveraging a modernized infrastructure and the ability to act on insights derived from data.

Data Types and Data Sources

Organizations are attempting to feed the data they continually ingest from a wide variety of sources into their analytics environment. Some data may come from server, storage, network, and other IT system logs and content management systems. Other data may be structured data from enterprise applications, and some data is unstructured, such as email, web pages, video/image files, and text documents. However, not all data is usable. Research shows that usable data types from which organizations can actually derive value differ based on maturity of the organization.

Organizations with *Modernized* IT leverage, on average, 3.5 distinct data sources within their analytics environment. Organizations with *Modernizing* IT generally use 3 data sources, while *Aging* IT departments use 2.5 data sources. Figure 2 highlights the different types of data sources organizations currently leverage in their environments.

Figure 2. Data Sources Currently Used in Analytics Environments



Source: Enterprise Strategy Group

Looking deeper into those types of data sources, an additional pattern emerges, which highlights how *Modernized* IT leverage data sources that put a greater demand on the infrastructure and require different infrastructures to properly store and manage that data. Whether leveraging structured sensor/machine data and web/click stream data, or utilizing more unstructured data in videos, images, sentiment, and social networking data, organizations with *Modernized* IT are much more advanced in the data types they use in their analytics environment than organizations with *Aging* or *Modernizing* IT.

The speed of or type of data utilized for analytics dictates the infrastructure required to properly store and process it. For example, the capacity required to store log files pales in comparison to satisfying the storage requirements of HD video.

When it comes to analytics, object storage is best suited to satisfy the storing and streaming of multimedia, while also enabling larger datasets to be searchable. In some cases, this means that moving data from where it's generated or initially stored, to a platform where analysis will be done, is putting a burden on the network. For processing, speed is crucial, so organizations that integrate the latest and greatest technologies as close as possible to where the data is analyzed will yield the most positive outcomes. ESG research shows that organizations with *Modernized* IT are nearly 3x as likely as organizations with *Aging* IT to report their analytics server infrastructure is less than two years old.

Modernized organizations are **3x** more likely to report their **analytics server infrastructure is less than two years old** compared to *Aging* organizations

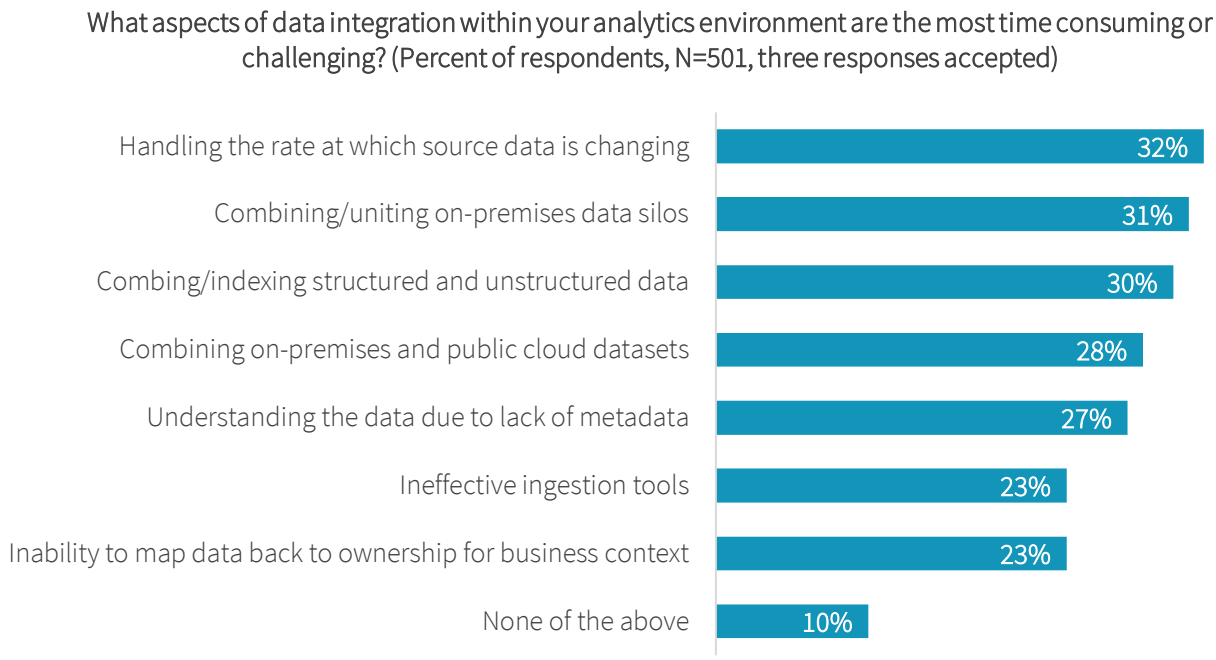
Data Integration

Considering the collection of massive amounts of different types of data, it's easy to see why organizations are struggling with data integration, regardless of how advanced an organization may be in its IT modernization journey (see Figure 3). Organizations with legacy IT infrastructures face challenges around the function of data integration and simply handling the breakneck speed at which source data is created and changed.

As an organization becomes more modernized, some data integration challenges can develop because of the various types of data being utilized from multiple locations. Challenges associated with uniting more on-premises data silos (42% among *Modernized* IT versus 23% for *Aging* IT); an inability to understand data due to a lack of metadata (32% versus 15%); ineffective ingestion tools (34% versus 19%); and an inability to map data back to ownership for business context (data lineage, 24% versus 10%) are all more likely to be challenges at organizations with *Modernized* IT. But overall, the benefits arising from IT modernization eclipse the challenges of data integration.

Organizations with legacy IT infrastructures face challenges around the function of data integration, ranging from simply handling the breakneck speed at which source data is created and changed to incorporating various types of data from multiple locations

Figure 3. Data Integration Challenges



Source: Enterprise Strategy Group

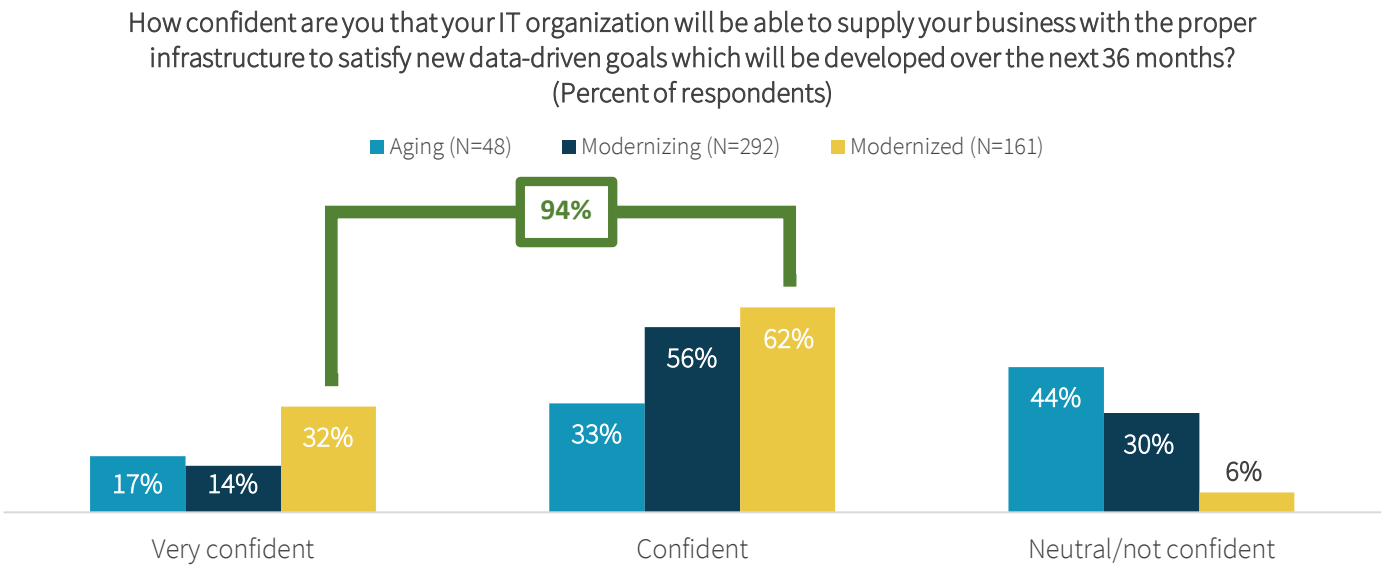
Drive IT Modernization Efforts to Achieve Data and Analytics Success

For organizations to gain and maintain a competitive advantage, they must first make efforts to focus on modernizing processes and infrastructure, while training and developing personnel in key areas. Based on ESG research, nearly all (94%) organizations with *Modernized* IT have confidence they can deliver infrastructure to support future data-driven goals over the next three years (see Figure 4).

94% of *Modernized* organizations have confidence they can deliver infrastructure to support future data-driven goals over the next three years

Organizations with *Modernized* IT most often report storing and analyzing data in core data centers. However, they explore operations at other locations. In addition to the core data center, they also frequently process data at the edge; analyze data in the cloud; and protect data in the cloud. This points to the preparedness of embracing hybrid cloud operating models with an effective workload placement strategy for traditional and cloud-enabled infrastructures. This enables not only the management of data where it resides, but also data migration and orchestration across environments.

Figure 4. Confidence in IT's Ability to Supply Infrastructure that Satisfies New Data-Driven Goals

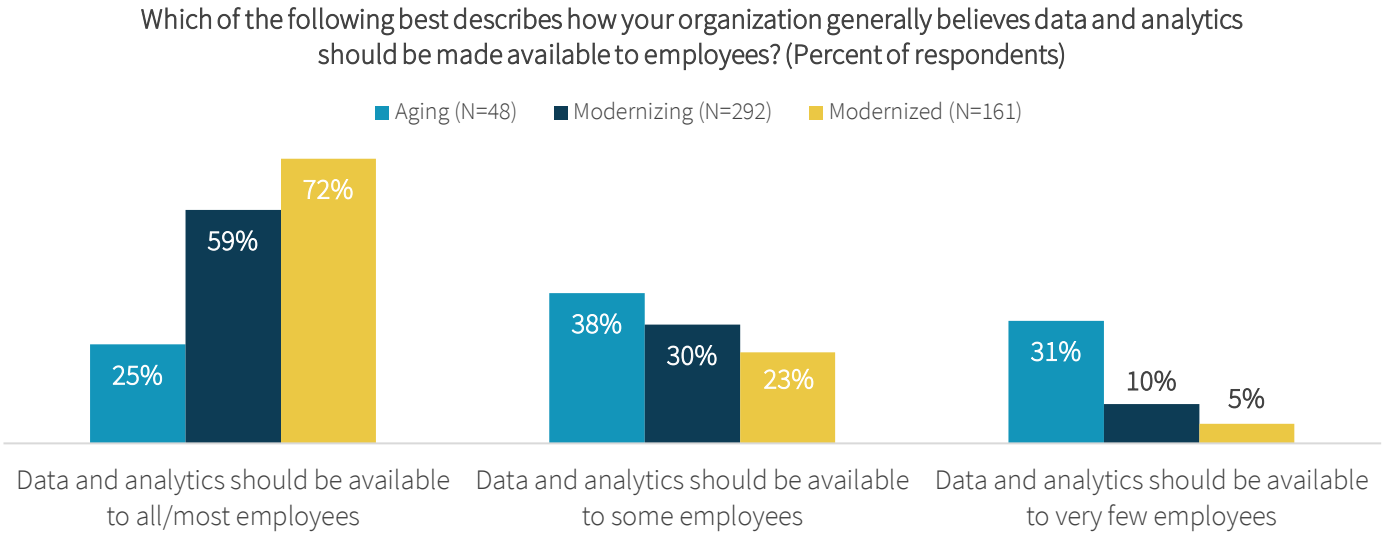


Source: Enterprise Strategy Group

Data Democratization

Data democratization is the idea of making data accessible to as many personnel as possible regardless of expertise level. The goal is to ensure that as more individuals and groups access data to make better business decisions, a heavier burden does not get placed on those who manage the data or the underlying infrastructure that supports the storage and processing of that data. Not only do organizations with *Modernized* IT use a greater number of data sources for their analytics endeavors, but they also believe that data and analytics should be available to all or most employees, compared with organizations with *Aging* IT that tend to make only structured and straightforward data types available to a subset of employees.

Figure 5. Prioritizing Data Democratization



Source: Enterprise Strategy Group

Based on ESG research, organizations with *Modernized* IT:

- Reported they provide employees with access to more data than is strictly necessitated by their role at more than **10 times the rate** of those with *Aging* IT (43% versus 4%).
- Were **5x more likely** than both *Aging* and *Modernizing IT* organizations to have extensive self-service analytics capabilities (30% versus 6%).

It should not be lost that organizations still require analytics expertise to further advance their data democratization efforts and data-driven initiatives. This is especially important with more advanced technologies, such as artificial intelligence (AI) and machine learning (ML). As such, investments in data science professionals and teams, including data architects, data engineers, data stewards, and data scientists are essential to becoming more modernized. In fact, organizations with *Modernized* IT are more than 3x as likely as organizations with *Aging* IT to have a formal data science team (68% versus 19%).

Intersecting Data, Analytics, and Infrastructure

As organizations continue to modernize their infrastructure to support data-driven initiatives, vendors understand the value of delivering simplified tools and features that augment their existing applications. This can provide deeper insight with virtually no additional work or time required of their customers. In these cases, analytics are done behind the scenes based on the expertise of the vendors providing the business application. A great example of this can be seen in vendors incorporating AI functionality into an existing product to help automate operations and provide rapid insight.

For business applications provided by the likes of SAP and Oracle, and relied on by many businesses across the globe, incorporating next-generation technology not only enables these vendors to maintain their leads in their respective markets, but also enables every organization that uses SAP and Oracle technologies to do the same.

SAP S/4HANA is an intelligent ERP system that prioritizes simplicity, automation, and next-generation processes to help organizations rethink the way business is conducted. And many of the processes are anchored by intelligence and learning capabilities through AI technologies, natural language processing, and predictive analytics. Oracle's comprehensive offering of machine learning, advanced analytics applications, platforms, and the autonomous database presents organizations with the means to automate processes (eliminating human error) and allows staff to work on more value-added initiatives as they continue down the path to digital transformation.

For both SAP and Oracle, as well as so many other vendors, the incorporation of intelligence into their products via artificial intelligence and machine learning is essential to remain a trusted provider and partner. And while these types of embedded features are meant to simplify day-to-day tasks and improve productivity by intelligently and automatically monitoring operations, recommending actions, and remediating issues, an additional burden may be placed on the underlying infrastructure. This further emphasizes the need for organizations to leverage modernized infrastructure—to not only support the core workloads relied upon by the business today—but also ensure that next-generation technologies can be properly supported without impacting business continuity.

The Bigger Truth

The ultimate value of data management and analytics to IT modernization is the broad benefits that can be achieved across all facets of the business, from infrastructure providers and data owners to application owners and lines of business. This quickly translates into competitive advantage for the entire organization. Companies must focus on investing in technologies that enable them to support current requirements of simply viewing, integrating, and analyzing all data across

the organization—regardless of data structure or where the data is located—as well as having an infrastructure foundation in place to support next-generation technologies such as AI and ML.

Whether your business is overly customer centric, obsessed with product/service innovation, risk averse when it comes to embracing next-generation technologies, or continuously looking for ways to optimize costs, every company should be exploring ways to better leverage its most valuable asset: data. Regardless of business philosophy, IT modernization and data-driven initiatives go hand-in-hand in arming the business with timely insights that can drive greater value. And ESG research supports this narrative in which market-leading businesses combine data and analytics with modernized IT to deliver key levels of valuable differentiation to their customers.

While modernized organizations have a lead over laggards when it comes to supporting data-driven strategies, it is still very early days. This should give hope to laggards knowing that while they feel they are currently behind the competition, it is not too late to get started. Identify the company's primary business strategy, such as offering the lowest prices, having highly differentiated products, or satisfying a niche market. Identify trusted technology vendors that can serve as strategic partners and insight enablers. And set focused goals with short-term performance metrics to track progress that will ensure a higher likelihood of success.

This ESG Research Insight Paper was commissioned by Dell EMC. To learn more about Dell EMC and its modernized infrastructure solutions, start by visiting:

- Servers
- Storage and Data Protection

Appendix I – Research Methodology

To gather data for this report, ESG conducted a comprehensive online survey of IT decision makers from private- and public-sector organizations in 8 countries: U.S. (59%), Canada (1%), U.K. (7%), France (7%), Germany (6%), Australia (6%), New Zealand (1%), Japan (12%), and China (12%). The survey was fielded between February 27, 2019 and March 21, 2019.

To qualify for this survey, respondents were required to be knowledgeable about their organization's analytics environment and have reported significant influence in their organization's purchase process for IT infrastructure (e.g., storage, servers, networking, virtualization, and/or data protection).

After filtering out unqualified respondents, removing duplicate responses, and screening the remaining completed responses (on several criteria) for data integrity, a final sample of 501 respondents remained.

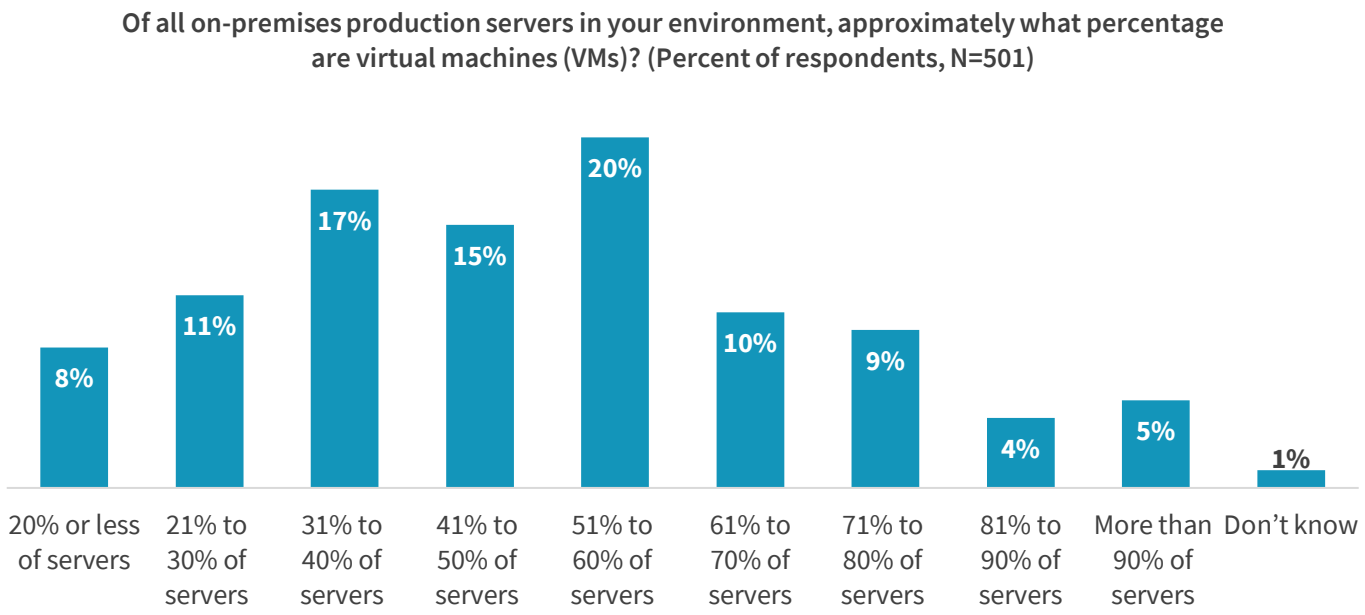
All respondents were provided an incentive to complete the survey in the form of cash awards and/or cash equivalents. Note: Totals in figures and tables throughout this report may not add up to 100% due to rounding.

Appendix II – Criteria for Evaluating Organizations' IT Modernization

To calculate an organization's maturity level, ESG asked each respondent questions about their IT environment and processes—allocating a corresponding number of maturity points to each question and answer. The sum of the points represented an organization's total maturity score.

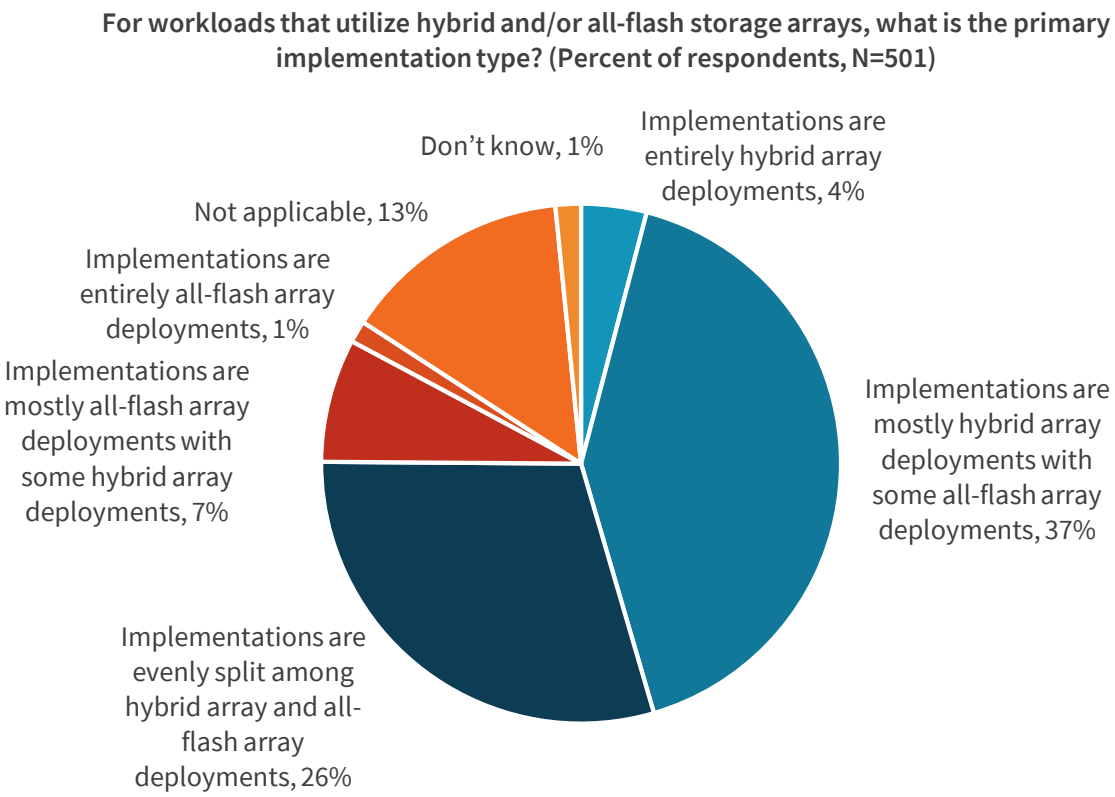
In total, a respondent's IT organization could earn a maximum of 78 maturity points. Those that earned 25 points or less (10% of respondents) were categorized as *Aging*; those that earned between 25.5 and 50 points (58% of respondents) were categorized as *Modernizing*; and those that earned more than 50 points (32% of respondents) were rated as *Modernized*. The figures that follow detail the questions used to segment organizations.

Figure 6. Percentage of Production Servers Virtualized



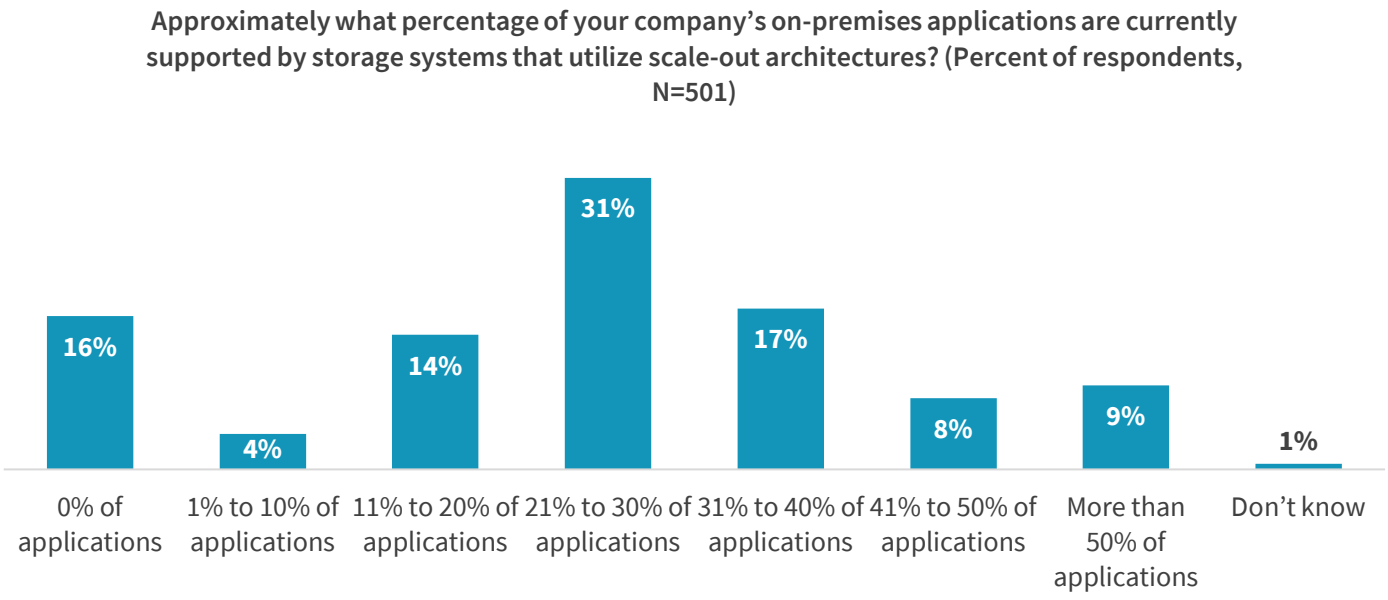
Source: Enterprise Strategy Group

Figure 7. Solid-state Storage Utilization



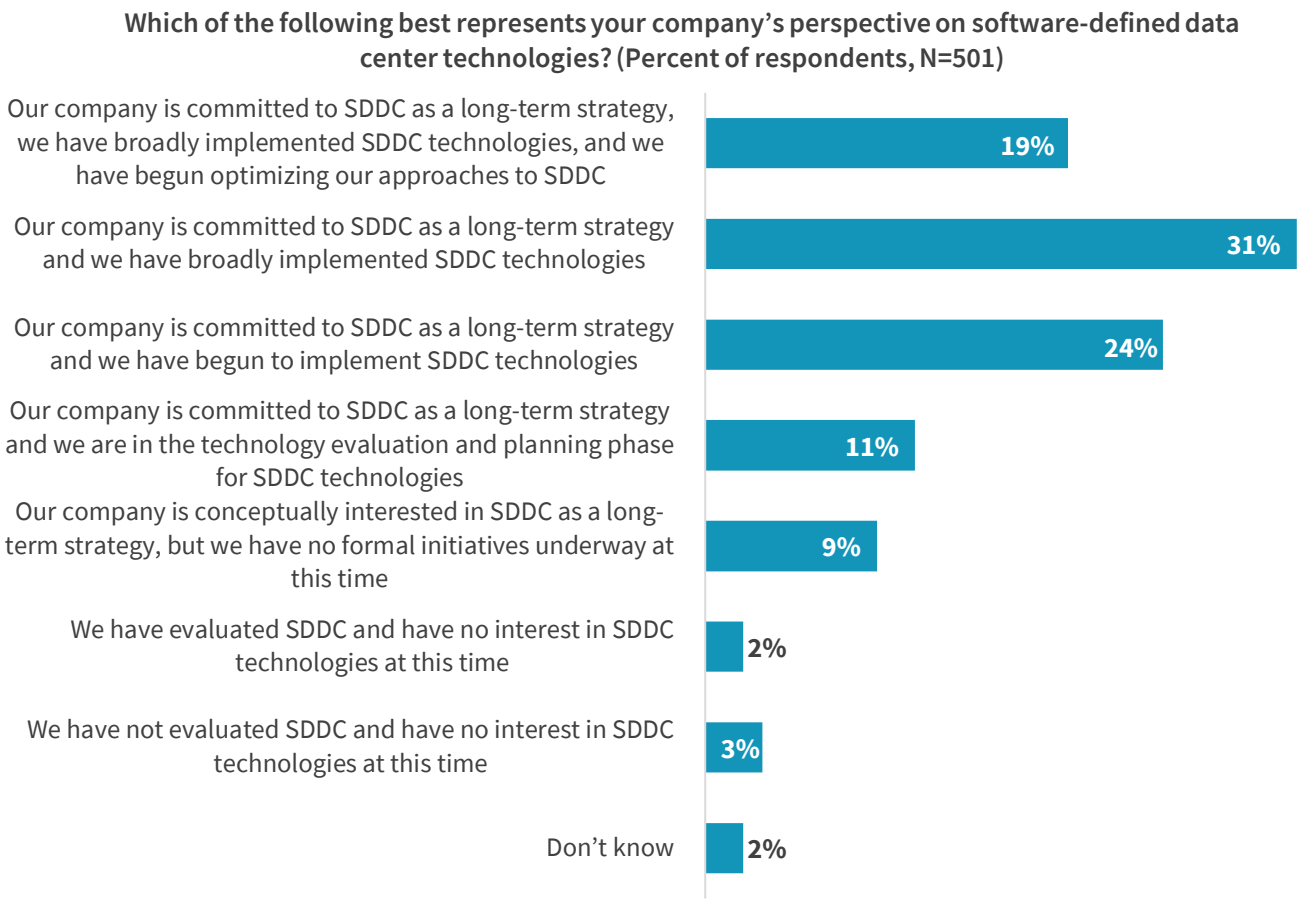
Source: Enterprise Strategy Group

Figure 8. Utilization of Scale-Out Storage



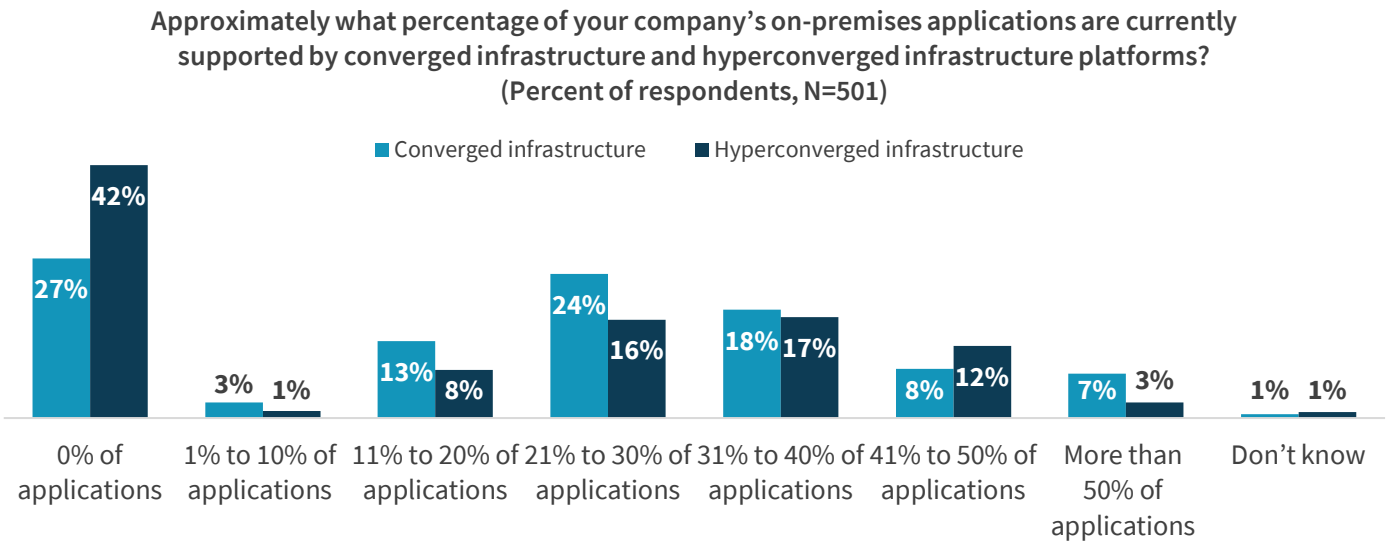
Source: Enterprise Strategy Group

Figure 9. Organizational Perspective of Software-Defined Networking and Storage



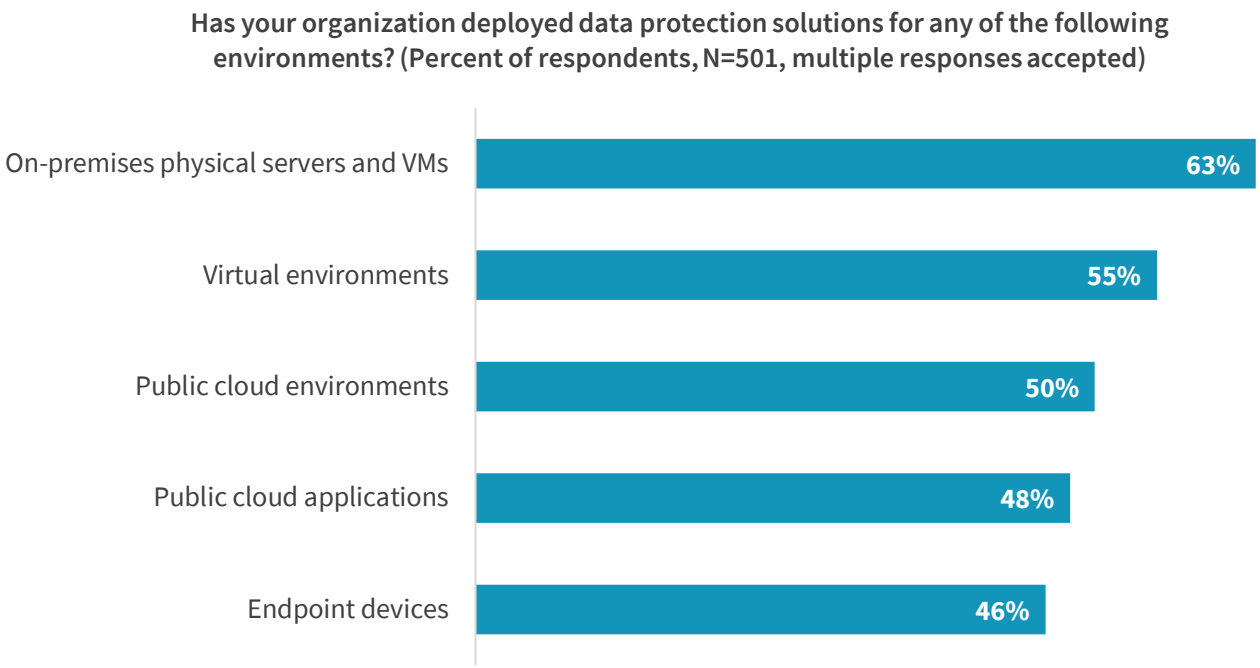
Source: Enterprise Strategy Group

Figure 10. Utilization of Converged and Hyperconverged Infrastructure



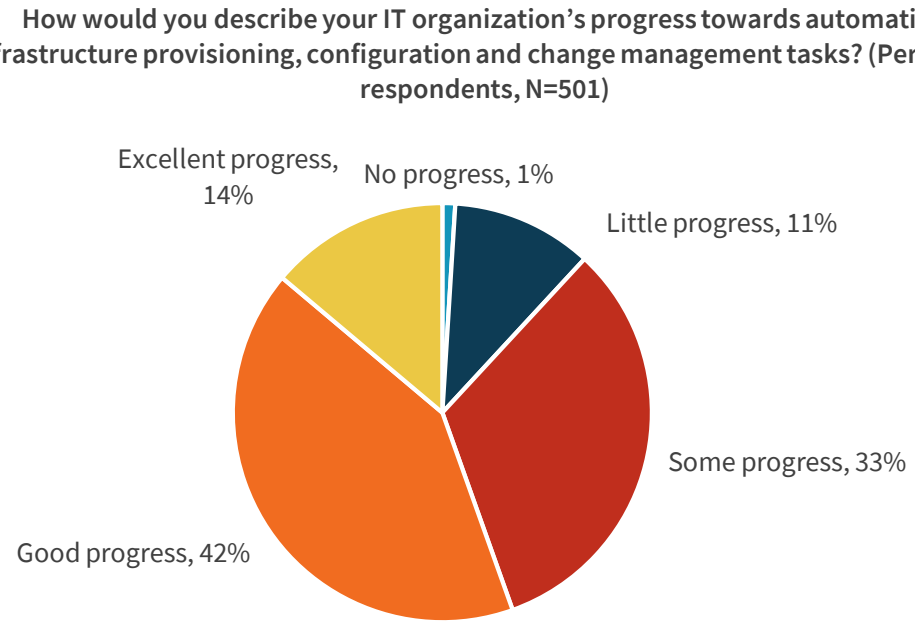
Source: Enterprise Strategy Group

Figure 11. Comprehensiveness of Deployed Data Protection Solutions



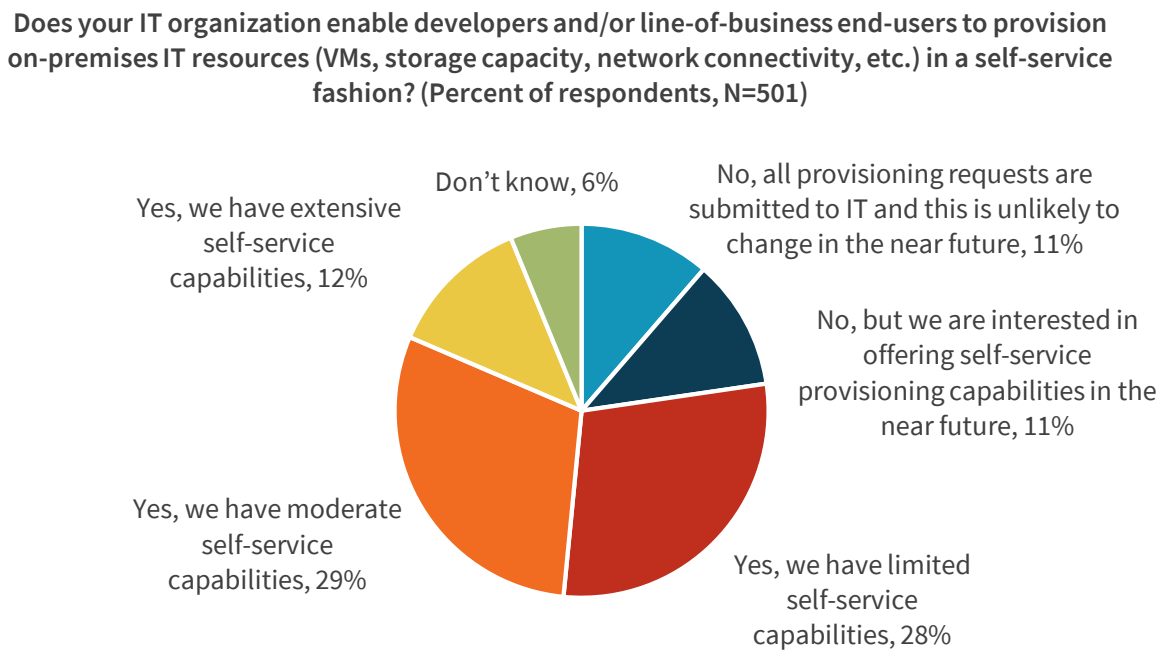
Source: Enterprise Strategy Group

Figure 12. Assessment of Organization's Infrastructure Administration Automation



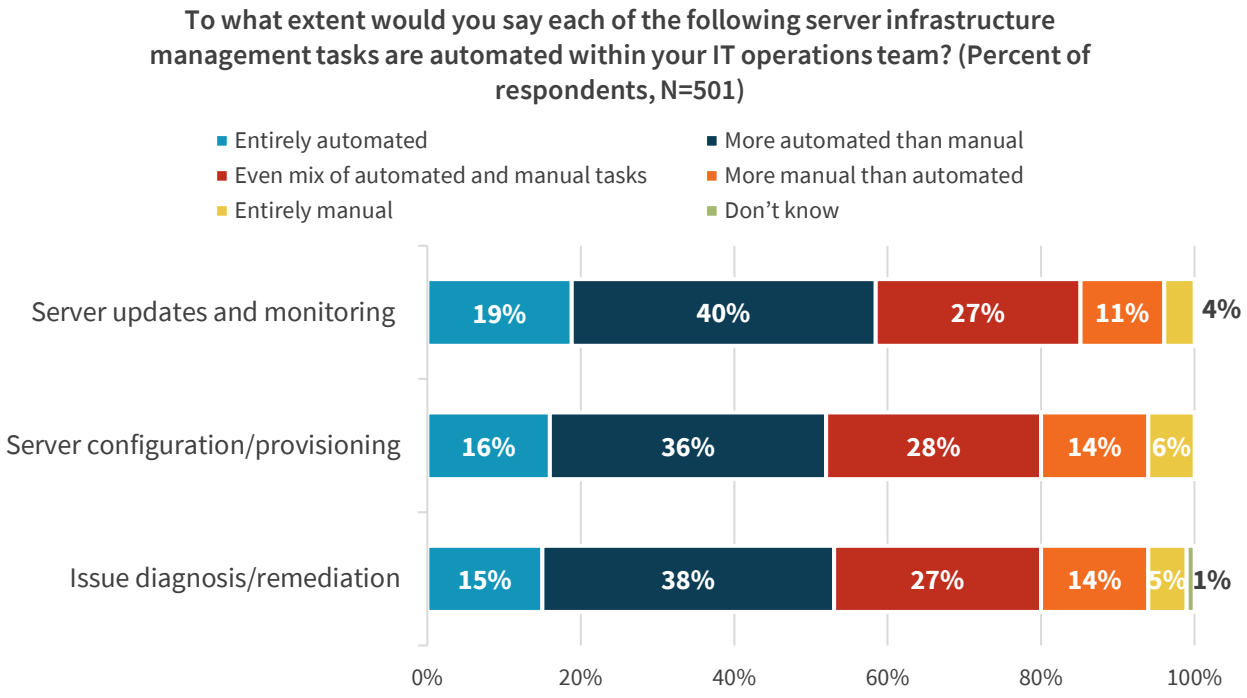
Source: Enterprise Strategy Group

Figure 13. Assessment of Organization's Enablement of Self-Service Infrastructure Provisioning



Source: Enterprise Strategy Group

Figure 14. Assessment of Server Administration Automation

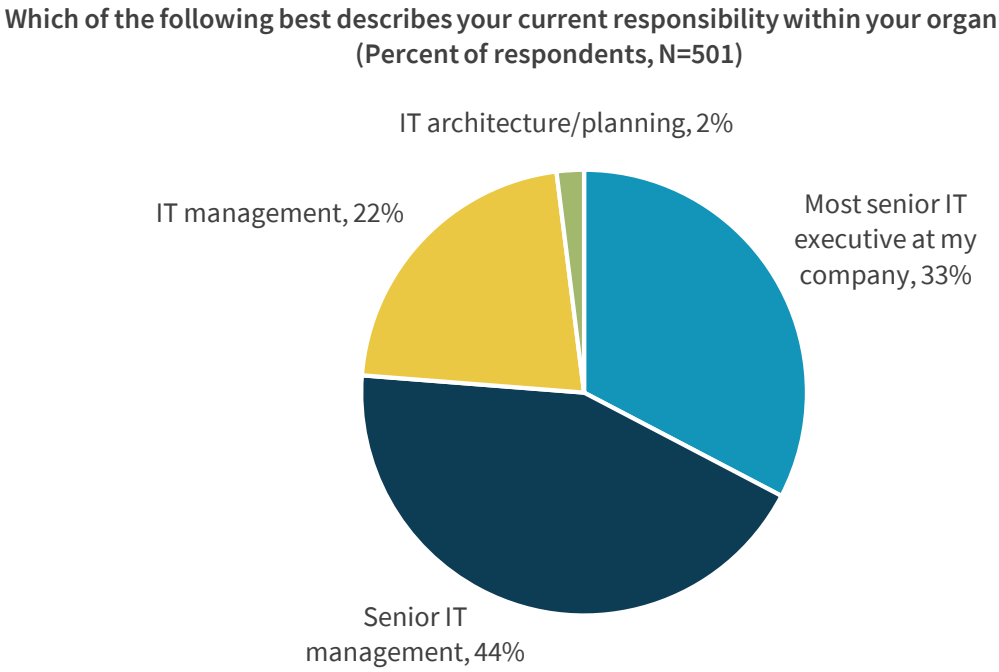


Source: Enterprise Strategy Group

Appendix III – Respondent Demographics

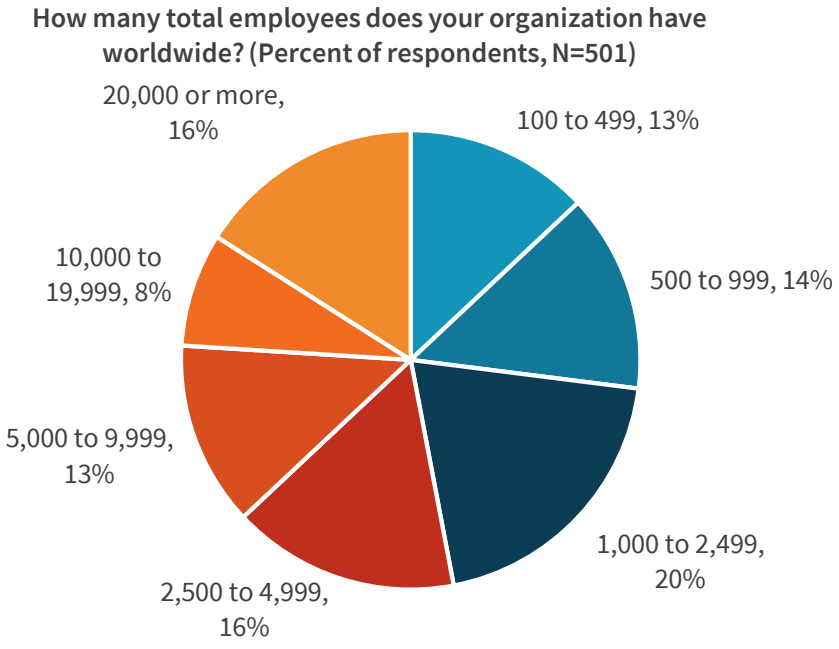
The figures below detail the demographics of the respondent base: individual respondents' current job responsibilities, as well as respondent organizations' total number of employees, primary industry, and annual revenue.

Figure 15. Survey Respondents, by Job Responsibility



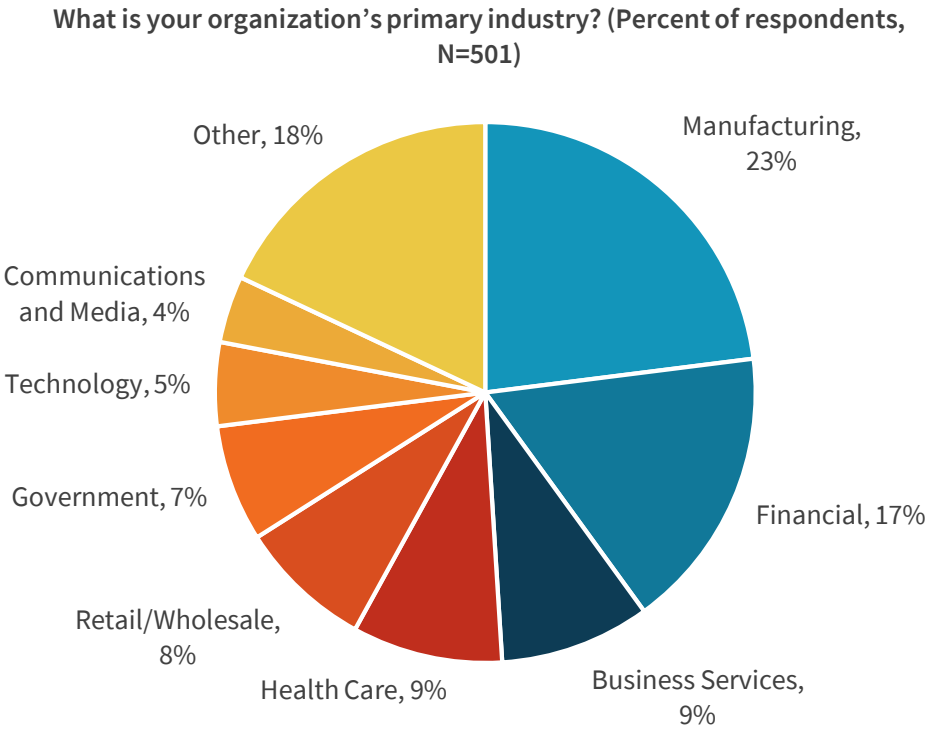
Source: Enterprise Strategy Group

Figure 16. Survey Respondents, by Company Size (Number of Employees)



Source: Enterprise Strategy Group

Figure 17. Survey Respondents, by Industry



Source: Enterprise Strategy Group