The Modern Data Center: Vital For Digital Transformation

The Business Benefits Of Data Center Modernization And The Imperative To Innovate

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Executive Summary

No longer solely the domain of IT, the modern data center now directly serves the corporate boardroom.

In September 2016, SAP and Red Hat commissioned Forrester Consulting to evaluate the benefits of data center modernization as a way to enhance innovation and digitally transform in support of business strategies and goals. Then to further explore this trend, Forrester developed a hypothesis that tested the assertion that in order to realize this vision, data center leaders must consider critical factors when developing modernization initiatives for their data platforms and systems and keep in mind the potential challenges and key benefits.

> **A modern data center is an informed and important partner to lines of business in strategy decisions.**

By conducting in-depth surveys and interviews with infrastructure and technology professionals, Forrester found that these companies achieved better business results and stronger partnerships with other lines of business (LOBs) as a result of data center modernization.

KEY FINDINGS

Forrester's study yielded four key findings:

> **It's not a question of when; companies are modernizing now.** As companies strive to innovate and transform in this digital age, no corner of the organization is safe from change. The data center is no exception. Nearly all companies we spoke to have at least started to modernize their data platforms and systems, and half have already re-architected or are expanding on the initial upgrade.

> **The drivers of modernization are both technical and financial.** Upgrading the data management environment is driven by the desire for higher availability, performance, and efficiency on the technical side. But these IT leaders are also fully aware of the business goals the company maintains as a whole and the requirement for increased efficiency and faster business responses while reducing costs. Said goals — like security and customer experience (CX) — also provide a backdrop to data center decisions.

> **Many and varied challenges speak to the broad impact of modernization.** Barriers to modernization exist technically, such as building flexible capacity and meeting real-time data needs; organizationally, such as upgrading and maintaining internal skillsets; and financially, such as dealing with rising costs and managing unforeseen business changes. Data center leaders must be aware of these myriad potential pitfalls and plan carefully. As a result, the need for comprehensive and strategic planning is crucial when undertaking a modernization initiative.

> **The modern data center is no longer siloed in IT but a connected business partner.** Despite challenges, the modernization of data management environments is imperative. It is important to remember that the goals of modernization are the goals of the business overall, and a modern data center is, in turn, an informed and important partner to lines of business in strategy decisions. Digital transformation, innovation, and customer obsession are necessary to win, serve, and retain customers, and a modern data center is, in turn, necessary to accomplish those goals.

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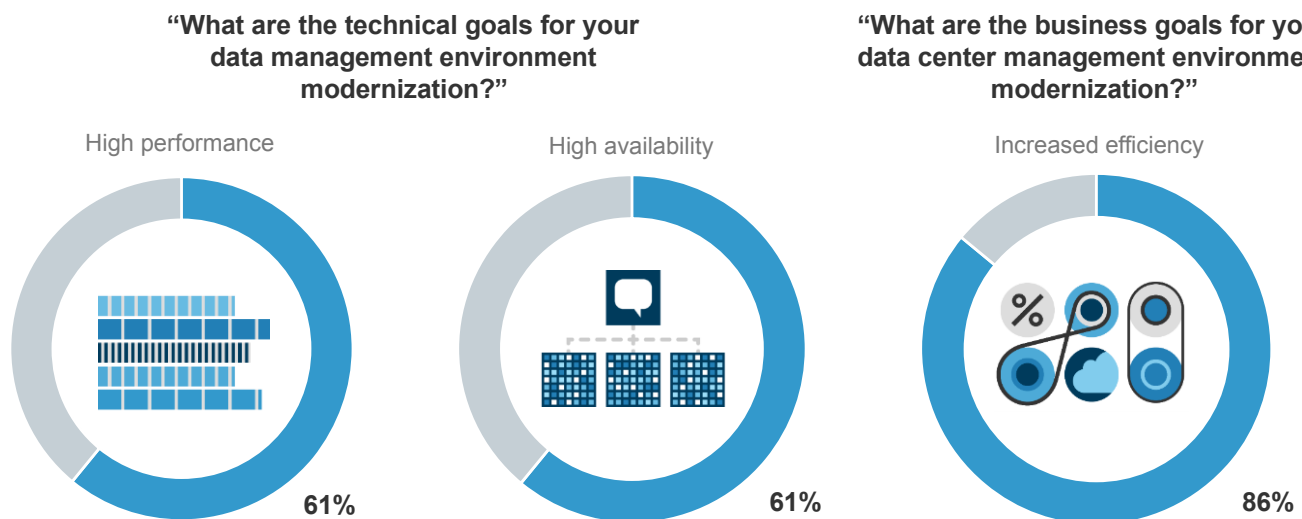## Driven By Efficiency And Performance Goals, Companies Are Modernizing

As companies seek to become nimble, customer-centric leaders, their data needs grow exponentially bigger and more complex. This is driving fundamental changes in data management strategies — data management centers must "modernize" and seek to optimize both technical and business goals in balancing the need for growth, real-time response, and efficiency. This level of transformation finds companies implementing, upgrading, and re-architecting their modern data ecosystem in order to win, serve, and retain their customers.

Red Hat and SAP commissioned Forrester Consulting to explore how companies are managing the ongoing challenges of the modern data management center. We also examined how their strategies support and enhance productivity and improve customer, employee, and partner experiences, while mastering the explosion of volume, complexity, and real-time requirements in data within the most efficient and economic cost structure possible.

Our study found that:

› **The majority of companies are already implementing or planning on implementing a modernization of their data center.** If you haven't pushed your organization down the path of modernization, you are already behind. It's clear that most organizations are aware of the need to modernize. Forty-five percent are planning to implement or are already implementing a re-architecture of their data management environment, while another 50% have either implemented these changes or are already expanding/upgrading. The drivers of this change are rooted in both technical and business needs. Nearly two-thirds noted high availability and performance as a goal, while a whopping 86% hope to increase efficiencies for their business as a result of modernization (see Figure 1).

› **Meeting key business goals — from security to improved customer experience — is key.** Though efficiency, availability, and performance are immediate drivers of data center modernization, it should come as no surprise that most companies also maintain a set of crucial business goals that inform all critical initiative decisions. Ensuring a secure environment is non-negotiable for firms, with 95% of infrastructure and tech professionals rating security as an important companywide goal. Customer experience — a concept that has the potential to require an "all hands on deck"

FIGURE 1
Primary Drivers of Modernization

"What are the technical goals for your data management environment modernization?"

High performance — 61%

High availability — 61%

"What are the business goals for your data center management environment modernization?"

Increased efficiency — 86%

Base: 300 infrastructure and tech professionals involved with data center management strategies
Source: A commissioned study conducted by Forrester Consulting on behalf of Red Hat and SAP, September 2016

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mentality from a company — rates as a close second. Gone are the days of a data center ruled by a few technology illuminati. The future will be dominated by customer-obsessed infrastructure and operations (I&O) teams relentlessly focused on sourcing the right portfolio of services and delivering higher quality customer outcomes faster and cheaper.[1] A customer-focused I&O organization is essential to create a data environment that works for the organization as a whole.

› **Companies are prioritizing initiatives that support both modernization and business goals.** Approximately three-quarters of those we surveyed noted that high performance, high availability, and comprehensive security capabilities were high to critical data management technology initiatives for their firms over the next 12 months. This requires a high degree of alignment between IT and LOB to successfully balance and implement. Firms are also prioritizing capital expenditure initiatives as part of their overall data center management strategy by planning for the need to upgrade or replace hardware, OS, and software in the next year (see Figure 2).

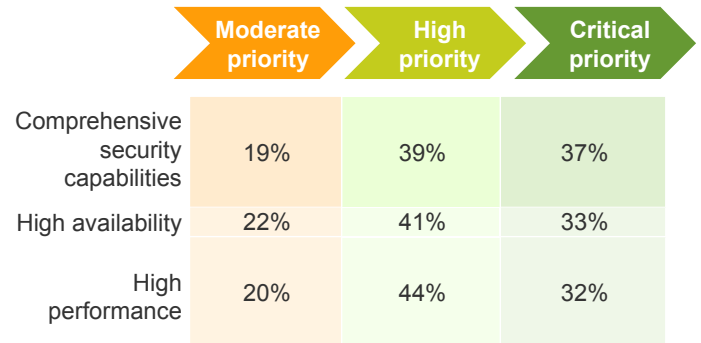## Modernization Challenges Span Every Facet Of Organizations

Just because a change is a necessity — and often exactly for that very reason — doesn't mean that it will be without challenges. On the contrary, the variety of issues that can and do arise during this process point to the broad impact that data center modernization has on the overall business. Though it may sit within the responsibility of IT, the impact of data center change is felt far and wide throughout the organization. All-encompassing in nature, barriers to change inevitably come from all sectors, ranging from technological to financial to structural:

› **Financial, organizational, and technology challenges plague the modernization process.** As with many business challenges, money is at the forefront. In our survey, just over half of respondents cited rising and unforeseen costs as a challenge — an issue that dovetails with the need to simplify. The desire to reduce platform and application quantities is a desire not just to decrease complexity but ultimately reduce costs and security risks overall. Abandon hardware and software that you can't integrate through APIs and replace it over time with API-rich solutions. Failure to do so will increase complexity and cost and systemically impede

FIGURE 2
Priority Initiatives Align With Business Goals

"How much of a priority will each of the following data management technology initiatives be to your organization over the next 12 months?"

	Moderate priority	High priority	Critical priority
Comprehensive security capabilities	19%	39%	37%
High availability	22%	41%	33%
High performance	20%	44%	32%

Base: 300 infrastructure and tech professionals involved with data center management strategies

Source: A commissioned study conducted by Forrester Consulting on behalf of Red Hat & SAP, September 2016

"One of our key challenges is to simplify — we want to reduce the number of applications and platforms in place because that ultimately reduces cost. Removal of complexity is a key driver."

— Principal lead infrastructure architect at a UK banking group

performance.[2] Ensuring staff are appropriately trained is also an issue for many firms — 43% of those surveyed reported that maintaining and upgrading internal employee skillsets is challenging. For the organization that seeks to upgrade its data environment, a team equipped with the proper skills is critical. This is a factor that could also ultimately reduce expenditures as well as remove the need for external help and ensure minimal costly mistakes along the way. And given the aforementioned preoccupation with a secure environment, it should come as no surprise that security risks and exposure also rise to the top of the

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challenge list (see Figure 3). Clearly, given the wide range of potential costly complications at stake, this is an undertaking that requires thoughtful and strategic long-term planning. Time spent ensuring all aspects are properly aligned prior to modernizing is sure to be time well spent.
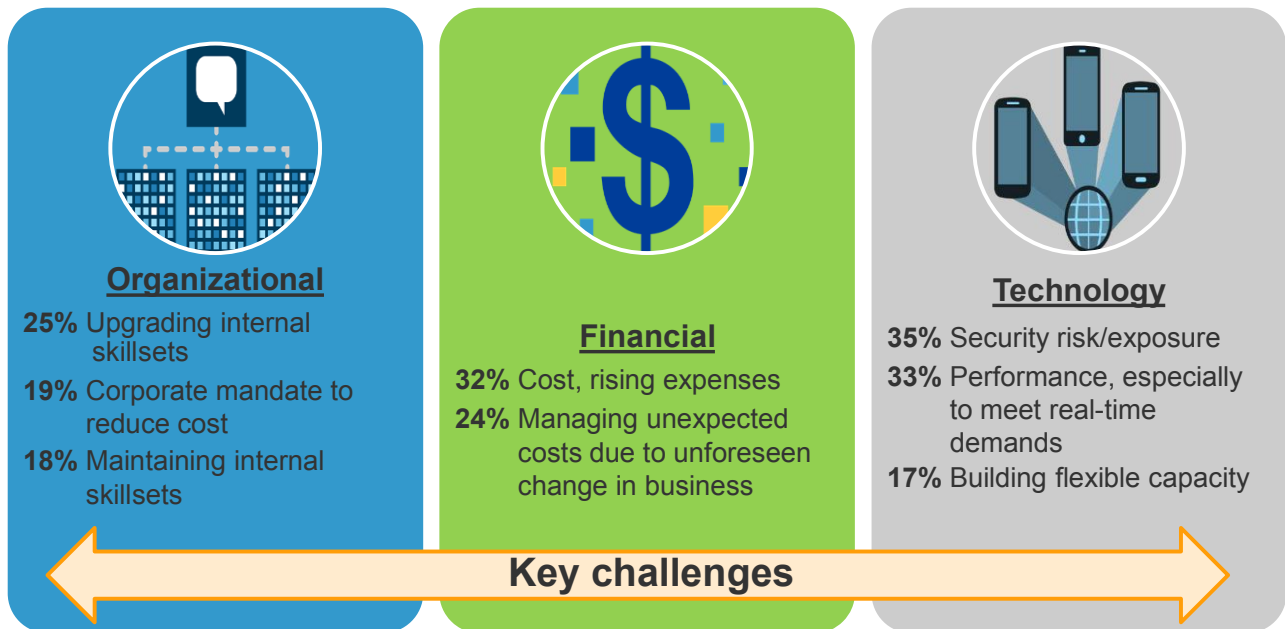
> *"[The process of modernizing] feels like planetary alignment. You have to find a window where you have the business driver for the ROI, you can time the hardware right, the business units are in line, and you have minimal risk."*

— Manager of information technology at a North American aerospace company

› **Businesses are planning carefully and running scenarios to manage risk.** The desire to be inclusive when planning such a large undertaking is present; 72% of those surveyed prioritize creating a comprehensive skills profile and organizational strategy for modernization in the coming year. This type of careful planning is indicative of the desire to minimize risk and emerge with a functioning, modern data environment. In order to deal with these specific challenges head on, companies need to adopt technological solutions that make financial sense and integrate easily into existing solutions while addressing real-time data needs. Many companies are already evaluating said tech solutions via such criteria (see Figure 4). Poorly integrated business data often leads to poor business decisions, reduces customer satisfaction and competitive advantage, and slows product innovation — ultimately limiting revenue, while adding little or no business value.[3]

FIGURE 3

Challenges Reflect Broad Impact Of Modernization

Organizational
- **25%** Upgrading internal skillsets
- **19%** Corporate mandate to reduce cost
- **18%** Maintaining internal skillsets

Financial
- **32%** Cost, rising expenses
- **24%** Managing unexpected costs due to unforeseen change in business

Technology
- **35%** Security risk/exposure
- **33%** Performance, especially to meet real-time demands
- **17%** Building flexible capacity

Key challenges

Base: 300 infrastructure and tech professionals involved with data center management strategies

Source: A commissioned study conducted by Forrester Consulting on behalf of Red Hat and SAP, September 2016
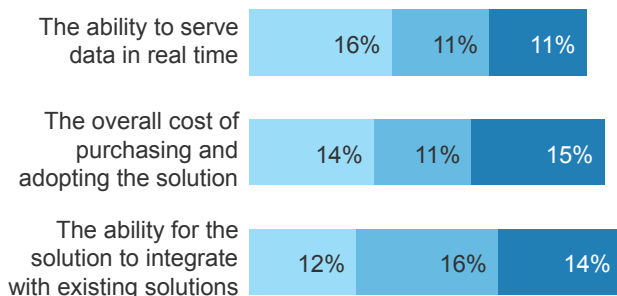
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FIGURE 4
Solutions Evaluated On Multiple Criteria

"Which of the following criteria would be most important to you when exploring technology solutions to modernize your data management environment?"

(Top three priorities)

	1	2	3

	1	2	3
The ability to serve data in real time	16%	11%	11%
The overall cost of purchasing and adopting the solution	14%	11%	15%
The ability for the solution to integrate with existing solutions	12%	16%	14%

Base: 300 infrastructure and tech professionals involved with data center management strategies

Source: A commissioned study conducted by Forrester Consulting on behalf of Red Hat and SAP, September 2016

› **There is no such thing as a one-size-fits-all data center.** Firms need the flexibility to make customizable purchasing decisions for both hardware and software. Traditional and lengthy change cycles are no longer acceptable. Businesses now must be elastic and agile, prepared to invest and test new concepts and business opportunities. The participants in our study agreed, with 35% listing flexible solution options as a key priority. To support this, I&O must provide a service delivery layer that allows users to plug reusable components together, supported with automation. Rather than a traditional service catalog that is static, automation needs a "build" layer with intelligence.[4] Firms must weigh the pros and cons of each option against cost, timelines, and business impact. The director of information for a Canadian municipality with whom we spoke, for example, paid a premium upfront for additional storage and speed for his upgraded data center. Due to his geographical remoteness and as a way to "future proof" his system from needing an additional upgrade in only five to seven years, he decided that the hardware costs were outweighed by the long-term benefits. Others may choose other approaches — in-memory data management, container platforms, multiprocessing architectures, or application strategies like microservices. This ensures

that modernization becomes an agile, continuous improvement process that can match the ever-increasing rate of business change.

The Modern Data Center Has Become A True Business Partner

Despite the challenges, companies remain committed to modernization and alignment on key business goals. Through comprehensive and strategic planning, infrastructure and technology professionals can and should lead the charge to modernize, mostly because not doing so would be tantamount to giving up. Modernization not only allows the business to keep up with the increasingly real-time data needs of business users, but it also lays the foundation for further innovation. Most importantly, however, the modern data management environment allows the data center to share equally in the decisions and success of a business. The key benefits of a modernized data center are as follows:
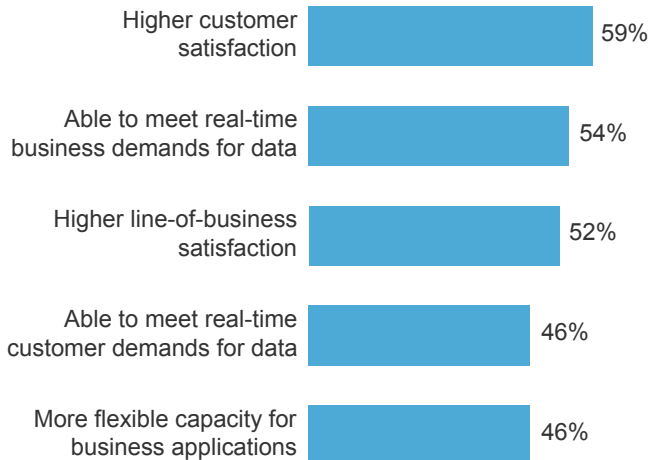
› **Now, both IT and lines of business share responsibility for business success.** Previously burdened by top-down management, organizational silos, and misaligned priorities, companies are now moving toward partnerships. Where once decisions may have been driven strictly by hard numbers and patterns, the modern data management environment is governed by a shared stake in business success. Over half of the infrastructure and tech professionals we surveyed indicated higher line-of-business satisfaction as an advantage of the modern data center (see Figure 5). That means that not only are IT professionals thinking about the impact the data center has on end customers, but they acknowledge the ability a high-functioning data center has to assist their business colleagues and the company as a whole. Even the language being used is shifting. The director of information technology for a Canadian municipality referred to the police department that utilizes his data center as a "key customer," which is yet another indicator that the mindset is switching from technical to business. In addition, the movement toward customer obsession and satisfaction and a need for real-time data analytics are creating a shift not just in data management processes but in the company culture itself. It's an acknowledgement by IT departments that continuous innovation, superb customer experience, and ultimately business success are not only within their reach but an essential responsibility of the job. Achieving key

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business goals creates empowered employees who, in turn, create a more customer-centric environment.

Modern Data Centers Drive Higher Satisfaction

"What do you think will be the top business advantages of your modern data center?"

Higher customer satisfaction — 59%

Able to meet real-time business demands for data — 54%

Higher line-of-business satisfaction — 52%

Able to meet real-time customer demands for data — 46%

More flexible capacity for business applications — 46%

Base: 300 infrastructure and tech professionals involved with data center management strategies

Source: A commissioned study conducted by Forrester Consulting on behalf of Red Hat and SAP, September 2016

"Our company operates on a digital economy. We believe in that digitalization, and the data center is the heart. If you don't have a strong heart, you won't get very far in running a marathon."

— Manager of information technology at a North American aerospace company

› **The desired modern data environment will accommodate current and future data needs with an eye toward innovation.** The ability to meet current and future data needs is considered a top business advantage of the modern data environment by over half of survey respondents. Firms are deploying their data centers on a variety of platforms in keeping with their need for low costs and flexible environments (see Figure 6). Organizations are realizing that putting lots of diverse data into a data lake won't magically create meaningful insights without further integration, transformation, enrichment, security, and governance. Delivering connected data across on-premises and cloud sources is not trivial, especially when it involves large data volumes, complex data models, and a high speed of ingestion. However, traditional technology stacks slow down data processing and delivery, largely because of slower hardware platforms, nonscalable data platforms, nonoptimized computing architecture, or batch data integration processes.[5] Modern, translytical databases — those that combine transactional, operational, and analytical databases into one single database instance — will aid in stated simplification goals and produce real-time insights. In our study, efforts to keep pace with innovation was not far behind data needs, with 52% agreeing that it's an advantage. This indicates that it's not enough that a modern data environment be sufficient today; it also must be useful tomorrow and look even further forward. With the increasing importance placed on faster and faster response times and the ability to serve data in real time, a flexible and responsive data center is key. Flexible data environments create efficiencies and open the door for future innovation down the line.

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› **The modern data center is flexible, secure, and an important part of a company's customer experience strategy.** Beyond meeting current and future data demands, the modern data center must deliver to the business goals of an organization. This requires an ongoing balance between data infrastructure and the applications and processes they support to ensure security, flexibility, and real-time data performance that can serve real-time customer needs holistically. That's what this is really all about. In the age of the customer, a company's CX strategy is wildly important to business success. And if the modern data center can help contribute to better customer experience levels, then the data center truly is in service of the boardroom.

"Using new technologies allows us to deliver products and services much more efficiently and frequently. We are becoming more innovative; we are keen to explore customer experiences and get feedback."

— Principal lead infrastructure architect at a UK banking group

FIGURE 6
Deployment Of Data Center Management

"How are you implementing or planning on implementing your data management platform?"	
On-premises tailored data center integration (TDI)	24%
Managed in private cloud	21%
Hybrid of some of these approaches	18%
Delivered as an on-premises appliance	16%
Managed in public cloud	11%
Other integrated onsite platform	6%
Hybrid of all of these approaches	4%

Base: 300 infrastructure and tech professionals involved with data center management strategies

Source: A commissioned study conducted by Forrester Consulting on behalf of Red Hat and SAP, September 2016

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Key Recommendations

Forrester's in-depth surveys and interviews with IT executives yielded several important observations:

› **Modernize now, and continue to innovate.** Customers won't give you the luxury of being able to rest in place for long. Firms leading the way in customer experience and the infrastructure to support it (data management being key) will increasingly take an agile approach to data management modernization. You have a rapidly expanding number of options for technology services, including, of course, your on-premises data centers. Virtualization, colocation, hosting, and more cloud forms than ever present you with plenty of choices. Choose among these to get the best value, but arm yourself with the right information and partners, as it changes daily.[6] And do not rest on your laurels; in order to truly get ahead in this rapidly changing environment, you must continue to push the envelope. Do not just keep up — lead.

› **Keep an eye on business goals.** Yesterday's IT was always about cost cutting. A smarter business technology (BT) agenda focuses on saving money, too, but the real focus is on making money. Data center economics requires both, but this thinking may prove difficult for technology managers and business leaders who are accustomed to the old mentality. Being a true business partner will be a crucial skillset for modern data center leaders.

› **Encourage collaboration and a shared sense of purpose among IT and LOB staff.** The whole subject of business success comes down to people. You employ smart (and probably expensive) people, so seek to maximize value through collaboration; redirect your talent to create new services and genuine customer value. This requires true partnership with your business colleagues and people who want to change the world and do it together.

› **Adopt flexible technology solutions that meet your business needs.** Proper tools are necessary for success. In order to modernize and assist the needs of your business, ensure that technological tools only aid in these goals, never impede. Look for solutions that enable efficiencies and faster business response, minimize security risks, and reduce costs over time. Consider translytical database solutions with in-memory capabilities to eliminate disk latency, simplify administration infrastructure, and produce real-time analytics. Investigate containers and microservices to improve software flexibility and deployment. Ensuring that teams are armed with the latest, most useful technology is critical to success.

Appendix A: Methodology

In this study, Forrester conducted an online survey of 300 infrastructure and technology professionals from the US, the UK, Germany, Mexico, Brazil, India, and China to evaluate the benefits of data center modernization. Survey participants included decision-makers in organizations with 500-plus employees across industries, in manager roles or higher. Forrester also conducted three interviews via phone with infrastructure and technology professionals from the US, the UK, and Canada. Respondents were offered a small incentive as a thank you for time spent. The study was conducted in September 2016.

Appendix B: Supplemental Material

"Organize Your Infrastructure Team For Customer Obsession," Forrester Research, Inc., December 16, 2015

"The Software-Defined Data Center Is The Future Of Infrastructure Architecture," Forrester Research, Inc., March 18, 2016

"Big Data Fabric Drives Innovation And Growth," Forrester Research, Inc., March 8, 2016

"The Next-Generation EDW Is The Big Data Warehouse," Forrester Research, Inc., August 29, 2016

"Weigh The Economic Factors Of Your Data Center Ecosystem Transformation," Forrester Research, Inc., October 19, 2016

"Emerging Technology: Translytical Databases Deliver Analytics At The Speed Of Transactions," Forrester Research, Inc., December 10, 2015

Appendix C: Endnotes

[1] Source: "Organize Your Infrastructure Team For Customer Obsession," Forrester Research, Inc., December 16, 2015.

[2] Source: "The Software-Defined Data Center Is The Future Of Infrastructure Architecture," Forrester Research, Inc., March 18, 2016.

[3] Source: "Big Data Fabric Drives Innovation And Growth," Forrester Research, Inc., March 8, 2016.

[4] Source: "The Software-Defined Data Center Is The Future Of Infrastructure Architecture," Forrester Research, Inc., March 18, 2016.

[5] Source: "Emerging Technology: Translytical Databases Deliver Analytics At The Speed Of Transactions," Forrester Research, Inc., December 10, 2015.

[6] Source: "Weigh The Economic Factors Of Your Data Center Ecosystem Transformation," Forrester Research, Inc., October 19, 2016.