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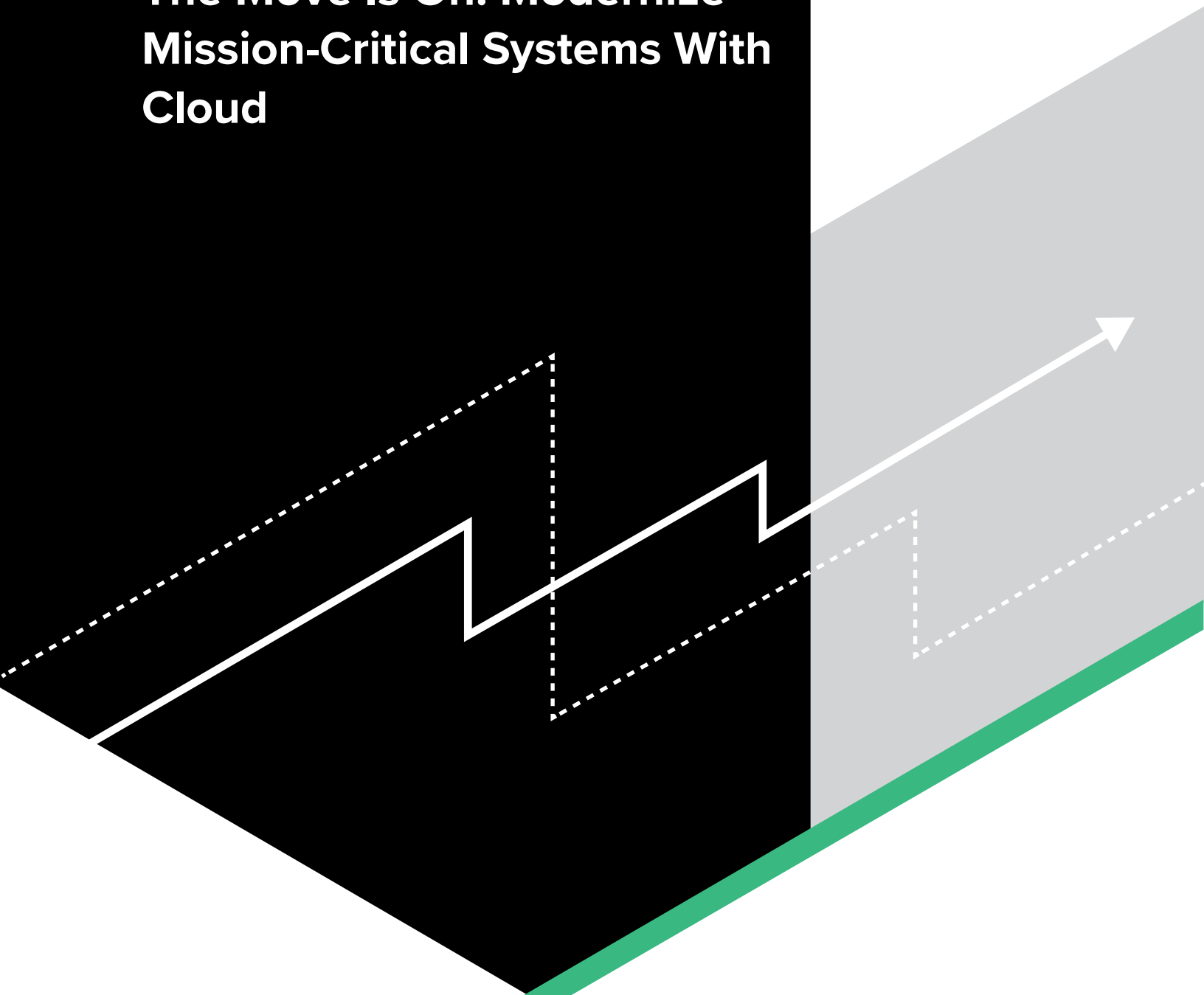
The Move Is On: Modernize Mission-Critical Systems With Cloud



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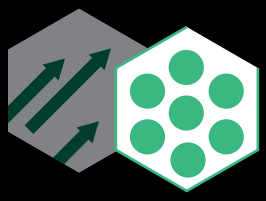


Executive Summary

Business modernization is a widely used term in today's business world, but its meaning is often ambiguous. At its core, business modernization is *application* modernization — improving the vital business systems and applications upon which all companies rely for day-to-day operations and customer-facing experiences. Most companies deploy a host of different systems and applications to run their daily business operations, but they typically have two or three critical systems that are essential to being able to operate and serve customers. These systems are commonly referred to as "mission-critical" or "business-critical." While the definition of critical systems varies by company, the need for these systems to be reliable, fast, accessible, and secure is universal. They're factors that are highly dependent on the infrastructure supporting a company's most important systems.

In March 2020, Microsoft commissioned Forrester Consulting to evaluate how companies are defining their most critical business systems and to explore what infrastructure they are using to support those systems now and looking forward. To uncover these insights, Forrester conducted an online survey with 412 global enterprise IT decision makers for organizations using public cloud and also conducted six interviews with technology and infrastructure decision makers from US-based companies. The findings showed that improving infrastructure for mission-critical systems is a constant priority and that cloud is growing in importance as a preferred infrastructure type for mission-critical systems.

KEY FINDINGS

- The most common criteria for defining mission-critical systems focus on revenue, business process, and customer impact.
- The type of systems most classified as mission-critical are financial management; governance, risk management, and compliance (GRC); and productivity and collaboration (including email and communications tools). However, there is significant variation by industry regarding which systems are most critical.
- Current infrastructure for mission-critical systems is hard to secure, maintain, and update without impacting business processes.
- The top five infrastructure requirements for mission-critical infrastructure are scalability, security, uptime, performance, and cost.
- The move to cloud is on: 70% of respondents said their company is actively planning or has already moved mission-critical systems to cloud to better meet its infrastructure requirements for mission-critical systems.

Optimizing Critical Systems Requires Defining Them First

Companies rely on their core business systems to win, serve, and retain customers. These systems need to run on infrastructure that is reliable, fast, accessible, and secure. Too often, core business systems are heavily customized, brittle, and tightly coupled to expensive and aging infrastructure. They are difficult to scale, extend, or modernize without introducing performance problems or business risk. But companies must modernize their critical systems to keep pace with the demands of new customers and the market.

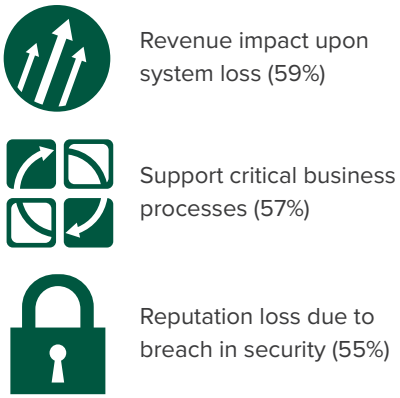
Modernizing critical systems helps companies fight off competitive threats, break down barriers to software and business innovation, simplify complex application architectures, and attract the next wave of skilled technical leaders. Also, every corporate merger and acquisition exposes duplicate mission-critical systems that companies need to rationalize and integrate.[1]

The starting point for optimizing critical business systems is first to define what makes a system critical or not. This classification process is key because, as the CIO at a university hospital and health system stated, "If everything is important, then nothing is important." Our survey revealed the following insights about how companies are thinking about their most critical applications:

- **The terms "mission-critical" and "business-critical" are interchangeable.** Eighty-four percent of surveyed decision makers reported that they consider both terms to mean the same thing. However, 45% of respondents said their company only uses one when referring to the core technology systems or applications within their organization. For this study, we use the term "mission-critical" to define these types of systems and applications.
- **Criteria for defining mission-critical systems focus on revenue, business process, and customer impact.** The most important business system are the ones that cost the most to lose, the ones at the heart of a company's most critical business processes, and/or the ones that would have the greatest impact on reputation if there is a security breach (see Figure 1). Businesses focus on these three areas because that is where the potential for loss or disruption is the greatest. When we asked decision makers about the impact of loss of a mission-critical system, they said disruption to business workflows (61%) and negative customer experiences (56%) were their top concerns. While they did not explicitly list loss of revenue as a top concern, they said workflow disruptions and negative customer experience have a direct impact on revenue. At the end of the day, revenue impact is consistently the ultimate negative consequence.
- **Internal consensus on defining mission-critical systems is lacking.** Nearly all respondents agreed that defining which systems are mission-critical is a shared responsibility between infrastructure and operations (I&O) and executive teams. However, only 49% reported that there is enterprise wide agreement regarding which business systems are considered mission-critical, and 18% said there are conflicting opinions with no consensus.

Figure 1

Top 3 criteria for identifying mission-critical systems



Base: 343 global enterprise decision makers for IT investments at organizations using public cloud
Source: A commissioned study conducted by Forrester Consulting on behalf of Microsoft, March 2020

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MISSION-CRITICAL SYSTEMS VARY BY INDUSTRY

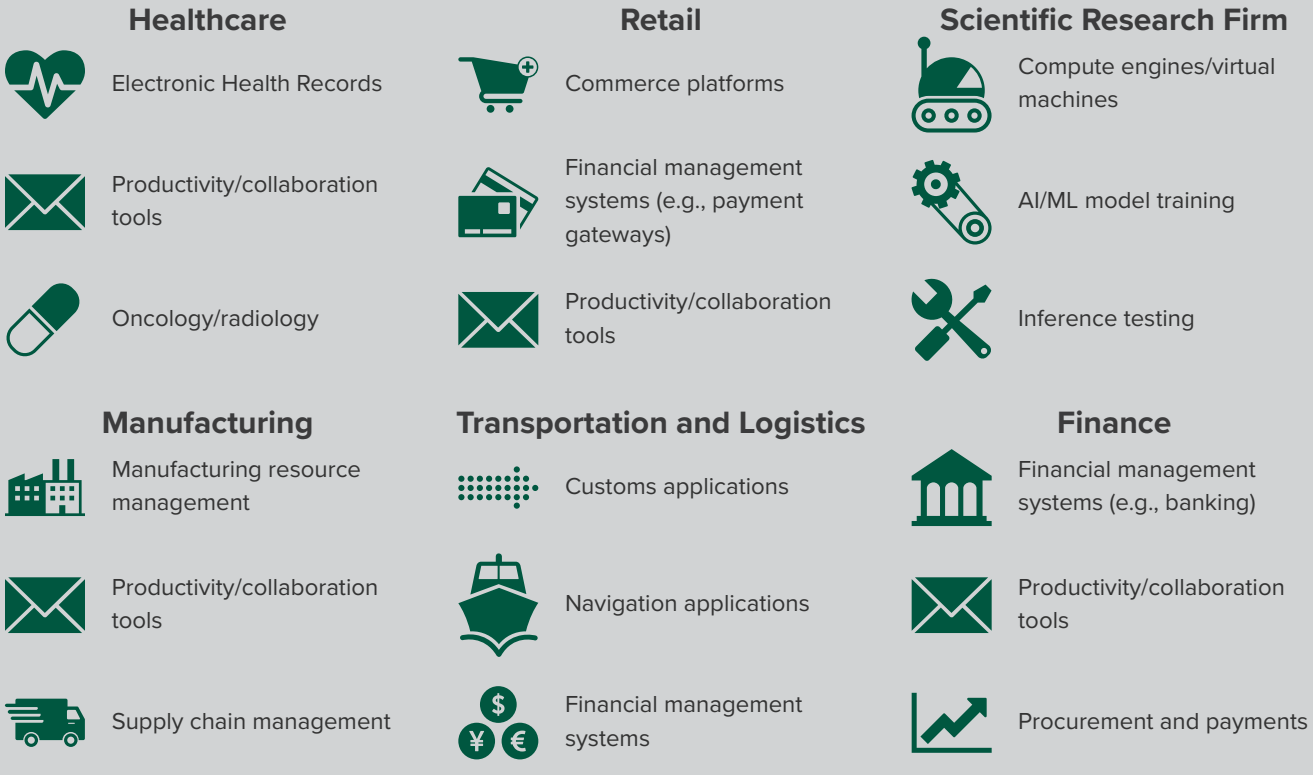
Across all industries, there are three types of systems that companies most commonly consider mission-critical: financial management; governance, risk, and compliance (GRC); and productivity and collaboration systems (including email and communications tools). Companies need to be confident in their ability to continuously operate and deliver value to their customers in a secure, compliant way. It was interesting to see email and communication tools among the top three overall, and they are especially important in healthcare, manufacturing, and finance. While collaboration systems may not directly touch customers or generate revenue, respondents from a large cross-section of companies definitely consider them to be mission-critical. The CIO of a hospital and health system explained, "We learned a long time ago that email, at least in this organization, is on par, if not even a little bit more of a critical app than the electronic health records system."

There was significant variation in the types of systems considered mission-critical across industries (see Figure 2). In healthcare, for example, electronic health records (EHR) and email are considered mission-critical as they are vital to supporting patients. Other priority systems by industry include commerce platforms (retail), banking systems (financial services), and manufacturing resource management (manufacturing).

> "We learned a long time ago that email, at least in this organization, is on par, if not even a little bit more of a critical app than the electronic health records system."
>
> *CIO at a hospital and health system*

Figure 2

Top mission-critical applications by industry



Base: Online survey of 412 global enterprise decision makers AND 6 in-depth phone interviews with senior IT leaders
Source: A commissioned study conducted by Forrester Consulting on behalf of Microsoft, March 2020

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Mission-Critical Systems Demand Reliable Infastructure

Managing the infrastructure supporting mission-critical systems is challenging. Respondents said the top challenges are that it's difficult (and expensive) to maintain security, the overall cost of mission-critical infrastructure is too high, and that it's too complex and risky to update or upgrade systems without negatively impacting business processes (see Figure 3). Taken together, mission-critical infrastructure is brittle, expensive, and difficult to secure. Also, mission-critical systems are very often highly customized to satisfy particular business processes or to improve performance or security. While customization may have been necessary or unavoidable in the past, the more any system is customized, the harder it is to update, migrate, extend, and secure.

Current infrastructure challenges have also added pressure on IT departments faced with demands to improve mission-critical systems. When asked to rank the most important features of an infrastructure platform to operate mission-critical systems, respondents called out the following (see Figure 4):

- **Increased scalability and flexibility.** Companies must be able to scale their mission-critical business systems to meet customer and business demands. Forty-four percent of respondents ranked this as a top-three requirement for mission-critical infrastructure. That was higher than any other attribute. However, nearly 50% of respondents said they are not confident in the current flexibility or scalability of their organization's existing mission-critical infrastructure. A VP of technology and operations at a financial services firm described the challenge by posing the question, "How do you construct an infrastructure environment that's efficient and flexible enough to absorb the business volumes and yet not have idle infrastructure for portions of the year?" If critical systems are unable to scale, companies will see disruptions to business processes and unhappy customers. The same is true for flexibility. Now more than ever, infrastructure must adapt to meet changing business needs on demand and offer a path forward without expensive rip-and-replace projects every time new infrastructure features are needed.

Figure 3

Top challenges faced when managing current mission-critical infrastructure:

46% Security issues

43% High costs

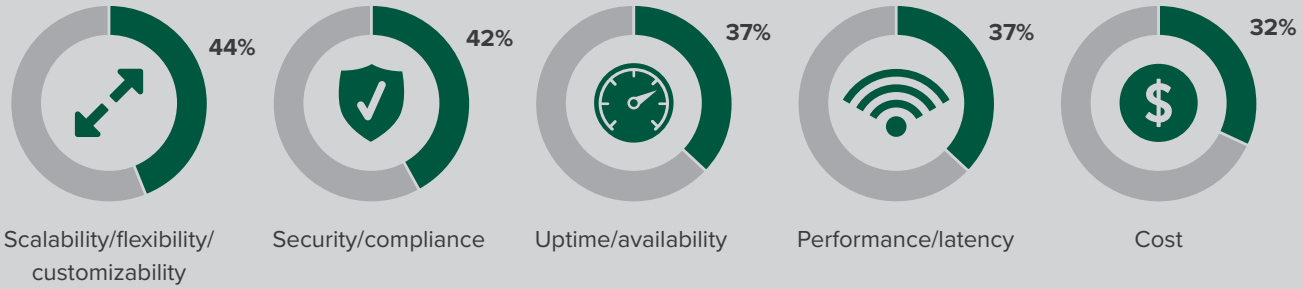
41% Too hard to make updates without disrupting the business

Base: 412 global enterprise decision makers for IT investments at organizations using public cloud
Source: A commissioned study conducted by Forrester Consulting on behalf of Microsoft, March 2020

> "How do you construct an infrastructure environment that's efficient and flexible enough to absorb the business volumes and yet not have idle infrastructure for portions of the year?"
>
> *VP of technology and operations at a financial services firm*

Figure 4

Top desired attributes for mission-critical infrastructure (% ranked as top 3 attribute)



Base: 412 global enterprise decision makers for IT investments at organizations using public cloud
Source: A commissioned study conducted by Forrester Consulting on behalf of Microsoft, March 2020

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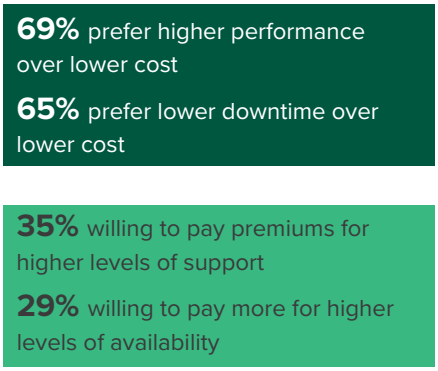
- **Strong security and data protection.** When it comes to security and compliance, respondents said their firms are most concerned about data protection, followed by data backup and recovery and threat detection. As one VP of operations described, "What worries me predominantly is not just keeping [critical systems] up and running, but it's keeping them safe and secure." Considering that most mission-critical systems deal with invaluable customer data or highly sensitive business data, solid data protection and availability is essential. Although respondents ranked scalability/flexibility slightly higher overall as a top priority for mission-critical infrastructure, 80% stated that they are willing to give up a little flexibility to get higher security, indicating that when faced with a choice to have a more flexible system that is less secure or a less flexible system that is more secure, firms will choose the one offering greater security.
- **Higher uptime and overall system availability.** Mission-critical systems by definition require the highest uptime and overall availability of any business system. Most respondents indicated that they have a high tolerance for blips and pauses caused by maintenance operations, but a much lower tolerance for jitters (i.e., small interruptions as a result of variability in the system leading to inconsistent performance) or unexpected reboots or platform restarts. The CIO from a retail company for which uptime is the top requirement for all mission-critical infrastructure said: "Uptime is mission-critical. That goes into your service-level agreements (SLAs) and contract negotiations. You need to make sure that companies can handle volumes, especially when you're a larger company." Mission-critical infrastructure must offer consistently high levels of uptime and be resilient to transient network problems.
- **Improved performance and lower latency.** Respondents expect mission-critical infrastructure to meet specific performance SLAs. Most (77%) feel that their firm's current infrastructure is adequate to meet its basic daily needs. However, fewer (63%) are confident in their company's ability to tune the performance of its mission-critical systems to meet fluctuating demand. With scalability being the top priority for mission-critical infrastructure, it is imperative that the performance of infrastructure remains consistent when scaled. This is especially critical for manufacturing. One CIO of a manufacturing firm said: "Availability is not the biggest concern. The major thing for us is keeping the performance up because people will not wait on the system. They're not used to that anymore. It can be challenging to keep steady, continuous performance at high levels."
- **Better price performance.** Cost of IT investments is always something that IT decision makers must be aware of, and 46% of respondents said that price performance is the most important consideration with cost for mission-critical systems. Customers expect to invest in mission-critical infrastructure, but they also expect that investment to hold value and be efficient. This suggests that companies are not necessarily looking for the lowest cost, but they are instead looking for what will give them the best overall return. That is why 35% percent of respondents said their company is willing to pay more for improved service and support, and nearly 30% would pay more to achieve higher levels of availability (see Figure 5). This supports the notion that availability, consistent performance, and rock-solid support for a company's critical systems are all more important than finding the lowest cost.

80% of respondents said they would choose higher security over less flexibility.

Figure 5

Price performance is the most important part of infrastructure costs, but it's not the lowest cost that matters



Base: 412 global enterprise decision makers for IT investments at organizations using public cloud
Source: A commissioned study conducted by Forrester Consulting on behalf of Microsoft, March 2020

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The Move To Cloud Is On For Mission-Critical Systems

Seventy percent of respondents said their company is actively planning or has already moved some of its mission-critical systems to cloud to better meet its infrastructure requirements. Also, 12% said their company is planning to migrate all of its most critical systems to cloud. These cloud deployments will leverage both software-as-a-service (SaaS) as a replacement strategy and infrastructure-as-a-service (IaaS)/platform-as-a-service (PaaS) as an extend and modernize strategy. The on-demand and flexible capabilities of cloud-based "as-a-service" technologies are increasingly the preferred method of modernizing critical systems. Indeed, 30% of respondents told us their organization is substantially increasing cloud deployments. This reflects companies' desires to outsource the infrastructure requirements of their mission-critical systems to providers that can better deliver the strong security, on-demand scalability, and consistent high performance those systems demand.

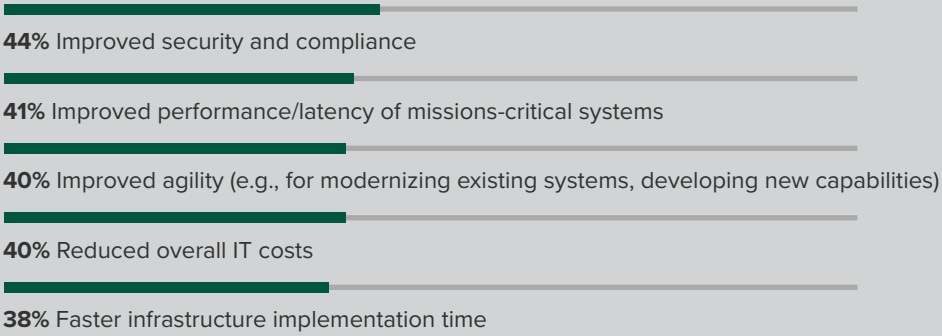
Whether running on-premises or in the cloud, companies demand infrastructure that flexes with the business and drives down the cost of operations. Cloud is proven to lower the operational burden on IT teams. An enterprise architect for a global shipping company described his company's cloud strategy like this: "We are looking to consume more of the managed stuff. So, we have a pull that underpins my strategy, which is consume... and that includes business-critical applications. For our business-critical applications, we need a provider that is a good custodian of our services and keeps taking on more and more operational running costs."

Cloud infrastructure is designed to address the key infrastructure challenges companies face when operating mission-critical systems. Specifically, respondents from companies that have migrated mission-critical systems to cloud (or are in the process of doing so) reported improved system security and data compliance, better system performance with lower latency, and an overall improvement in business agility (see Figure 6). It is easier to modernize legacy systems and to add new features and capabilities to systems running in the cloud. In addition, respondents told us their organization's move to cloud has also lowered IT costs and accelerated the pace of implementation.

Whether running on-premises or in the cloud, companies demand infrastructure that flexes with the business and drives down operations costs.

Figure 6

Top benefits achieved or expected by moving to cloud



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Source: A commissioned study conducted by Forrester Consulting on behalf of Microsoft, March 2020

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Here are a few examples from our study that reveal how companies in various industries have taken advantage of cloud:

- The CIO of a large retail chain explained how cloud offers his organization improved security while also reducing the burden on his team: “Here’s the beauty of going with cloud systems or applications as a service – If there are security requirements or patches or things that are needed to be done, you are not doing that anymore. The provider is doing it.”
- For a manufacturing company, the decision to shift to cloud started with its email exchange system. The CIO said: “The business case to move our exchange to a cloud solution was a given from a performance and cost perspective. It was a no-brainer to move this to the cloud and then go after other things. That’s how the cloud journey started.”
- An enterprise architect at a global shipping company described how his business was using cloud to drive innovation: “We try and move away from leveraging the cloud as an extension of how we’ve always operated, and instead we want to leverage some things like machine learning and big data and that sort of stuff. We’ve moving away from seeing cloud as just a service and instead as a driver of innovation.”

Companies are using cloud to transform the brittle infrastructure powering their most important systems (the ones they have delayed or avoided changing for years) to elastic, secure, automated, and efficient infrastructure that can flex with changing business needs.

Key Recommendations

Every enterprise has a portfolio of mission-critical systems that must always be up and running at top performance. To achieve the highest levels of availability and performance, companies have spent millions on dedicated infrastructure and skilled professionals to care and feed these critical systems. Cloud offers a way for companies to rethink their approach to deploying and operating mission-critical systems, starting with how they consume, provision, and operate the infrastructure powering them.

Customer and business needs are unpredictable, and companies today must ensure that the critical infrastructure supporting their most important systems can react to these changes with minimal disruption. They must also find ways to scale, secure, protect, and improve system performance without introducing more risk or downtime. Leading companies are increasingly turning to cloud to provide the infrastructure foundation required to unlock flexibility and agility.

To optimize the infrastructure for your mission-critical systems and take advantage of the benefits cloud can offer, Forrester recommends the following:

Run a strategic portfolio analysis. Identify your most important mission-critical systems and update the list quarterly. A sound understanding of current systems and infrastructure capabilities (and limitations) is an essential first step to driving improvements for mission-critical systems.

Catalog your primary mission-critical infrastructure challenges. Explore what has held you back from modernizing in the past (e.g., security concerns, high migration cost, business risk, impact on business process, lack of skills). Identify where those challenges still exist and come up with a tactical plan to address them.

Identify the first mission-critical app to modernize with cloud. Don't try to update all your mission-critical systems at once. Start slowly so that you can understand the process and potential challenges. From there, establish a secure target public cloud environment and identify your modernization pattern for future systems.

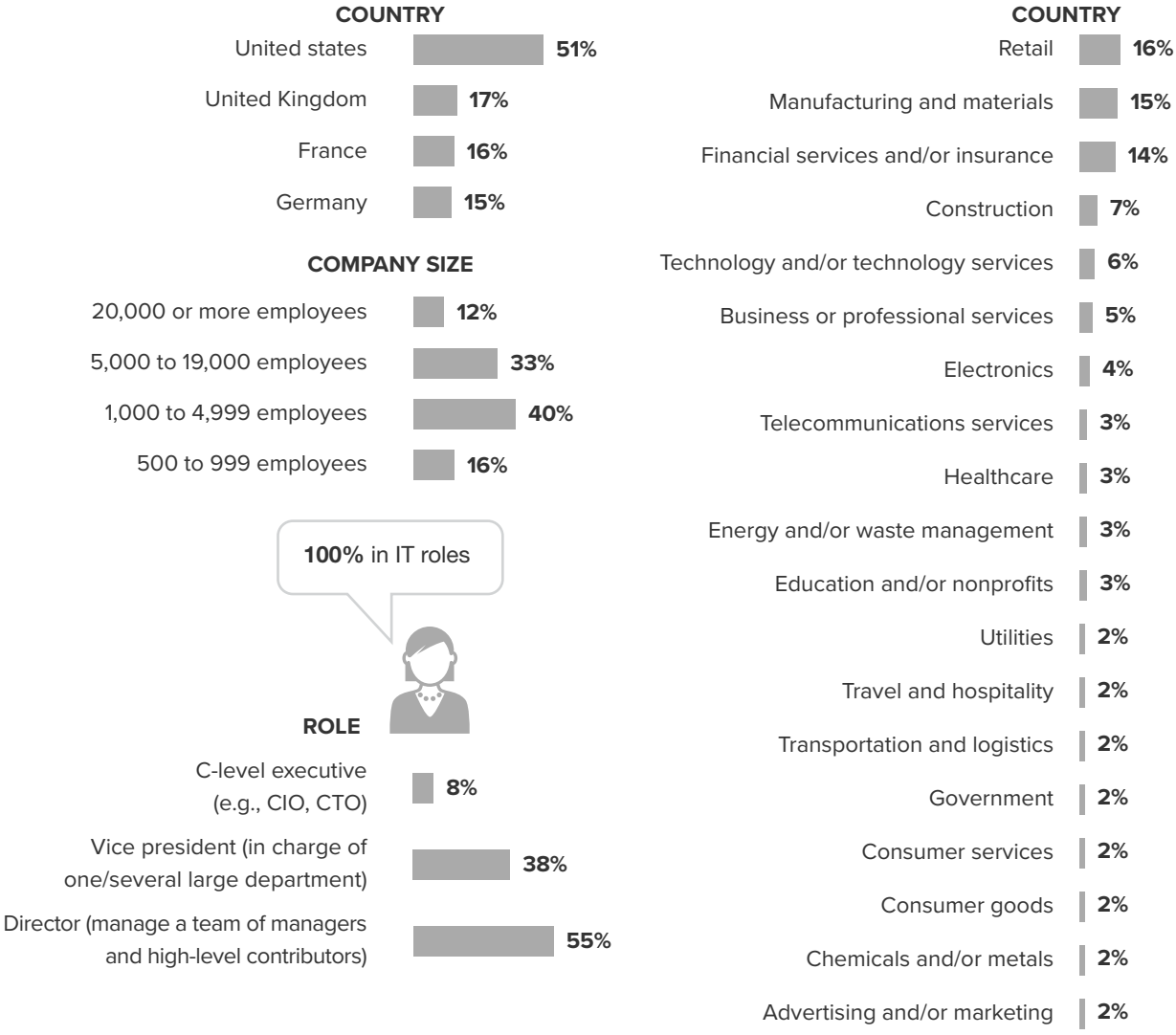
Hire, retrain, and leverage migration partners for cloud management skills and environment setup. To accelerate modernization, determine whether a lift and shift (no refactoring) adds sufficient value or if you'll need code refactoring or module replacement.

Establish clear metrics for success and create a plan to measure them. Have a clear understanding of what your organization values most with critical systems. Whether it's higher availability/performance, infrastructure flexibility, improved customer experience, scalability, or cost savings, clearly identifying what your organization needs and values most will better help you track the success of your modernization efforts. It will also help you in choosing and selecting cloud partners that can best meet your preferred requirements.

Appendix A: Methodology

In this study, Forrester interviewed six IT decision makers (of which three were contacts provided by Microsoft) at companies across multiple industries to discuss their mission-critical systems and cloud migration strategies. The study also included an online survey of 412 IT decision makers at the director-level or higher from companies with 500 employees or more in the US, the UK, France, and Germany. Questions provided to the participants sought to define mission-critical systems, identify what attributes of those systems are most important, and understand how companies are using or planning to use cloud infrastructure to support critical systems. The study began in February 2020 and was completed in March 2020.

Appendix B: Demographics/Data



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Appendix C: Endnotes

[1] Source: "Modernize Core Applications With Cloud," Forrester Research, Inc., August 5, 2019.

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