A Forrester Consulting
Thought Leadership Paper
Commissioned By Dell EMC

November 2018

Insights From Modernized IT: How To Achieve The Greatest Success As You Automate

Research-Driven Guidance Based On How Organizations Have Transformed IT From Manual To Automated

FORRESTER®

Table Of Contents

Project Director:
Sophia Christakis,
Market Impact Consultant

Contributing Research:
Forrester's Infrastructure & Operations research group

To learn more about the project sponsor, Dell EMC PowerEdge servers, visit: www.dellemc.com/servers

ABOUT FORRESTER CONSULTING

Forrester Consulting provides independent and objective research-based consulting to help leaders succeed in their organizations. Ranging in scope from a short strategy session to custom projects, Forrester's Consulting services connect you directly with research analysts who apply expert insight to your specific business challenges. For more information, visit forrester.com/consulting.

FORRESTER®

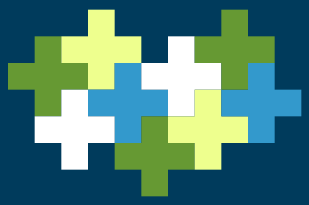
Executive Summary

Too often, enterprises try to master IT transformation via piecemeal efforts rather than holistically. To succeed, they need to transform and optimize IT by modernizing server infrastructure, automating the delivery and consumption of IT services, as well as transforming their people and processes. While nearly all enterprises report progress towards server modernization and automation, those that do both to a high degree achieve the greatest business and technical benefits. We call those enterprises "Modernized," and they have a great deal to teach companies that are looking to optimize the return on their IT transformation initiatives.

In May 2018, Dell EMC commissioned Forrester Consulting to evaluate the state of IT servers and automation, and the role they play in furthering IT transformation strategies. To explore this topic, Forrester conducted an online survey of 500 global IT professionals with responsibility for infrastructure technology purchases. Our research uncovered the following key findings:

KEY FINDINGS

- **The importance of server automation is evident.** All surveyed respondents reported making at least a little progress towards automating their server management processes. Typically, this revolved around provisioning, configuration, and change management; 67% describe their progress as "good" or "excellent."
- **Automation is an ongoing process that requires reflection and adjustment.** Ninety-eight percent of those further along in their automation journey would make changes if they could go back to the beginning of their automation projects. In particular, they would focus on modernizing their server infrastructure first, refining existing processes before automating, and working with a service provider to smooth out bumps in the road.
- **The one-two punch of server automation and modernization combined is profound.** Modernized firms — those that prioritize both server automation *and* modernization — achieved the best benefits. Sixty-one percent report higher systems reliability and faster deployment/delivery of services, relative to roughly a third of less modernized firms. Modernized firms achieved a 2.3x greater reduction in opex (16% versus 7%) and capex (7% versus 3%). Workers also enjoy time saved on routine, repetitive IT management tasks, which was 1.5x better for Modernized firms (21% versus 10%).



Relative to Aging firms, Modernized firms enjoy:

- 2.5x greater reduction in staff needed for routine IT tasks
- 2.3x greater savings on opex and capex
- 2.2x greater time saved on troubleshooting

To transform IT, companies must prioritize hardware automation *and* modernization.

FORRESTER®

IT Transformation Needs Server Automation

CIOs and CTOs have a mandate to improve the technology foundations required to win, serve, and retain customers. For most, this requires IT to embark on a transformation journey that evolves technology, people, and processes.

However, outdated systems and cultures hold IT transformation back.[1] In order to achieve their transformation goals, organizations must optimize service delivery through a combination of automating and modernizing. Our research shows that:

- **Organizations are moving toward a modernized, software-defined, infrastructure.** As many as 44% are currently implementing or planning to implement software-defined data center (SDDC) technologies — an increasingly popular approach to molding hardware with software at will. Another 48% express interest in adopting SDDC, despite not having formal plans in place yet. In addition, as many as 66% classify modern IT infrastructure (programmable hardware, infrastructure-as-code (IaC)) as "important" or "extremely important" to the success of their automation strategy.
- **Modern servers enable automation.** Modern servers can be treated like software, modelled as code, and managed entirely through automation down to the bare metal.[2] This enables them to better tie in application delivery and business prerogatives. It also reduces risk and improves opex. Firms in our research that do this well enjoy more efficient IT staffing: The percent of time saved on routine, repetitive IT management tasks was improved by 1.5x.
- **Organizations have made progress with server automation.** The operational complexity that comes with managing software-defined hardware makes automation critical. In 2017, less than a third of global infrastructure decision makers identified server automation as a "critical" or "high" priority, but our research suggests that this is changing.[3] All respondents report making at least a little progress toward automating server provisioning, configuration, and change management, and 67% describe that progress as "good" or "excellent."

To win, serve, and retain today's customers, most organizations must undergo an IT transformation.

Outdated systems, processes, and cultures hold IT transformation back.

In order to achieve their IT transformation goals, organizations must optimize infrastructure delivery through a combination of automating server management and modernizing hardware.

AUTOMATION OF IT SERVER MANAGEMENT RESULTS IN SIGNIFICANT TECHNICAL AND BUSINESS BENEFITS

Automation has the power to reduce costs and boost speed while simultaneously increasing quality, agility, and security.[4] All organizations surveyed report one or more technical and business benefits because of IT server automation. The most frequently cited benefits were higher systems reliability, faster deployments/delivery of services, and more efficient IT staffing (see Figure 1). This enables IT to deliver product updates faster which, in turn, delights the customer. It also ensures that, once delivered, those products run soundly, ensuring the customer has a great experience.

All organizations are automating IT servers to some degree — and 100% report one or more benefits from doing so.

Figure 1

The Benefits Of Server Automation

"Which, if any, of the following benefits has your company realized because of IT infrastructure automation?"
(Select all that apply; showing the top 10 benefits)

Base: 500 infrastructure technology purchasing decision makers
Source: A commissioned study conducted by Forrester Consulting on behalf of Dell EMC, June 2018

FORRESTER®

Few Companies Are Realizing The Full Potential Of Server Automation

Organizations are making encouraging progress toward modernizing servers and applying automation to server management. These efforts help free staff from routine server management tasks and save time on provisioning resources via self-service capabilities — efficiencies that are critical to directing scarce resources to strategic tasks, like innovation and IT transformation. Unfortunately, while all companies in our research report automating IT server management to some degree, few are reaping full rewards from their automation efforts because:

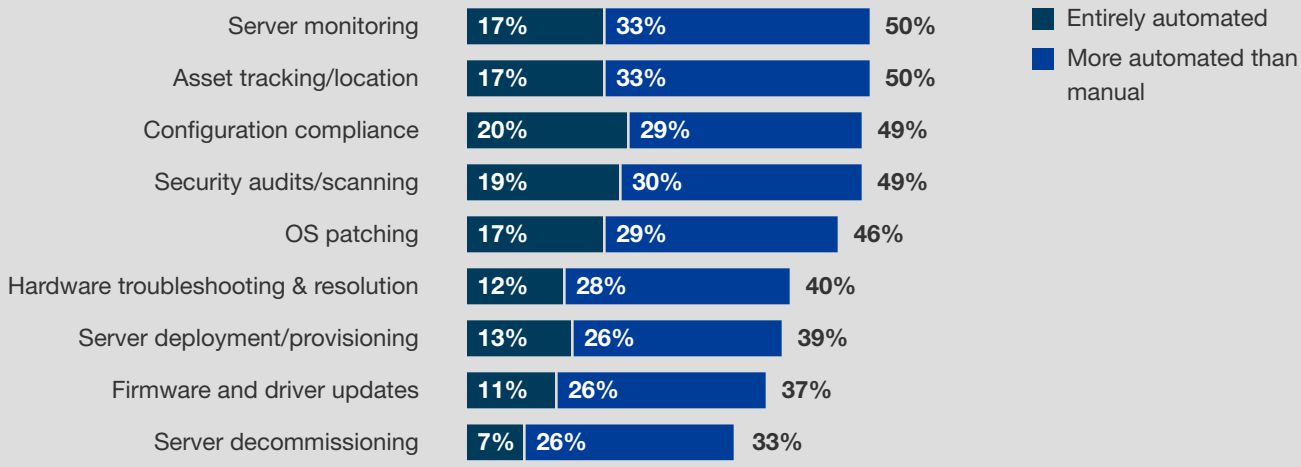
- **Too few have truly automated key server management tasks.** While most claim "good" or "excellent" progress toward automation, just 50% or less say any one of nine server management tasks are more automated than manual. Just 20% or less have automated them entirely (see Figure 2). Server deployment, firmware/driver updates, and server decommissioning automation levels were especially low — fewer than 40% described any of these as at least mostly automated. This means, while organizations are making progress, change management processes are still holding them back.
- **Too many provisioning requests still depend on IT involvement.** Digital businesses are under pressure to deliver fast — they cannot afford to have infrastructure deployments that constrain them. Yet, half still provision resources manually and do not have self-service capabilities, and 52% need days to provision these resources instead of just hours. As lines of business adopt development operations (DevOps) practices, they require real-time access to IT resources. IT organizations must do better if they want to stay relevant and avoid a rise of shadow IT.

While all organizations are automating, most are struggling to do so effectively.

Figure 2

Too Few Have Truly Automated Server Infrastructure Tasks

"To what extent would you say each of the following server infrastructure management tasks are automated within your IT operations team?"



Base: 500 infrastructure technology purchasing decision makers
Source: A commissioned study conducted by Forrester Consulting on behalf of Dell EMC, June 2018

FORRESTER®

COMPANIES MUST DO MORE TO AUTOMATE IT

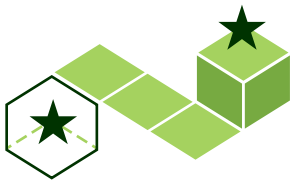
While organizations currently enjoy some benefits from their IT server automation, even greater benefits are possible. Success is attainable with a holistic strategy that is focused on modernizing servers, filling skills gaps, refining processes, and fostering a culture that welcomes change. Evolving server infrastructure and automation is an ongoing effort that requires reflection and adjustment.[5] In fact, 98% of those further along on their automation journey would make changes if they could go back, and there is an opportunity to learn from them.

WHAT THOSE FURTHER ALONG THEIR AUTOMATION JOURNEY WOULD DO DIFFERENTLY

- **No. 1: Prioritize efforts to modernize server infrastructure itself.** Modernized, software-defined infrastructure is fast, scalable, and dependable. Those with greater automation experience say prioritizing infrastructure modernization (programmable hardware, IaC) is the top thing they would do differently if they could.
- **No. 2: Refine existing processes before implementing tools.** Automation accelerates the execution of what you do — whether good or bad.[6] Those with greater automation progress emphasize the importance of refining processes before evaluating tools. Understanding what processes that tools must support — and which ones can be refined or eliminated — ensures alignment.
- **No. 3: Work with a trusted services partner.** Those that have only recently embarked on their effort to automate server management may overestimate their ability to manage and integrate new tools. A partner can fill skill gaps and help optimize automation strategies over the long term. Those later in their automation journey say that leaning on partners more is one of the top things they'd adjust about their initial automation approach.
- **No. 4: Reskill existing employees.** Without the right people overseeing your automation, all other aspects of the program will fail. Because modern servers are software-addressable, administrators must now morph into software developers that write code.[7] They also must be able to comfortably navigate a heterogenous ecosystem of on-prem and cloud technologies and partners. Equipping administrators with the right skills to manage this new reality is important.
- **No. 5. Standardize DevOps practices.** Finally, those later in their automation journey would have paid more attention to standardizing their DevOps practices. This is in line with Forrester's DevOps recommendations, which includes adopting technology business management solutions, transitioning to an automated deployment of both applications and infrastructure, and revamping the traditional change management processes.[8]

There is an opportunity to learn from these early automation adopters. Yet, fewer than half of the organizations in the beginning stages of their automation journey intend to incorporate any of these five tactics into their automation strategy. And only 41% are focused on modernizing server infrastructure — the most important success factor overall.

The No.1 thing those later in their automation journey wish they would have done differently is prioritize efforts to modernize server infrastructure.



71% say inefficiencies due to a lack of server automation are a challenge to their AI strategies.[9]

Modernized Servers Unblock Automation Friction

To squeeze the most value from automation, functionality must be built atop a modernized hardware foundation. Those with high infrastructure maturity — defined as having greater adoption of seven modern infrastructure attributes (see Figure 3) — better extend their automation across several areas. Relative to those with low maturity, high modern infrastructure maturity firms are significantly more likely to:

- **Report greater progress toward automation.** As many as 85% of those with high modern infrastructure maturity describe their progress toward automating as "good" or "excellent," relative to just 50% of those with low maturity (see Figure 4). Wide spreads can also be observed in the automation of specific server management tasks. High modern infrastructure maturity firms report greater automation levels with margins ranging from +12 to +26 percentage points over low maturity firms. Differences in server deployment/provisioning, firmware and driver updates, and asset tracking/location automation are especially pronounced.
- **Provide extensive self-service capabilities.** Not only are organizations with high modern infrastructure maturity more likely to offer self-service capabilities for the provisioning of IT resources (56% versus 44%), they're significantly more likely to describe those capabilities as "extensive" (30% versus 6%). This results in meaningful time savings. Our research revealed that companies with extensive self-service capabilities for server deployment are 3.8x more likely to get IT provisioned in less than one hour relative to those that need to send provisioning requests to IT.

Organizations with high modern infrastructure maturity are significantly more likely to offer "extensive" self-service capabilities.

Firms with "extensive" self-service capabilities are 3.8x more likely to get IT provisioned in less than one hour than those that rely on IT.

Figure 3

Modern Infrastructure Maturity

Defined by:

- Percent of on-premises production servers that are virtual machines
- Workloads entirely or mostly supported by all-flash storage array deployments
- Percent of on-premises applications supported by scale-out storage
- Commitment to SDDC technologies as a long-term strategy
- Percent of on-premises applications supported by converged infrastructure
- Percent of on-premises applications supported by hyperconverged infrastructure
- Number of environments that have data protection solutions deployed

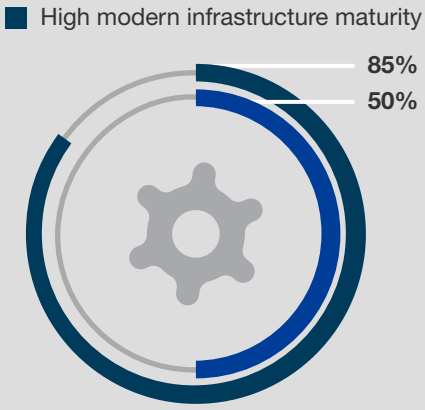
Source: A commissioned study conducted by Forrester Consulting on behalf of Dell EMC, June 2018

Companies with greater adoption of these dimensions were defined as having high modern infrastructure maturity.

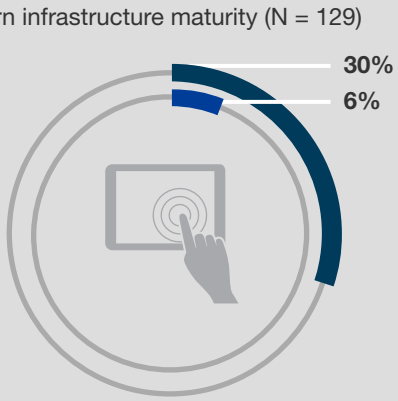
Figure 4

Modern Infrastructure Drives Automation Success

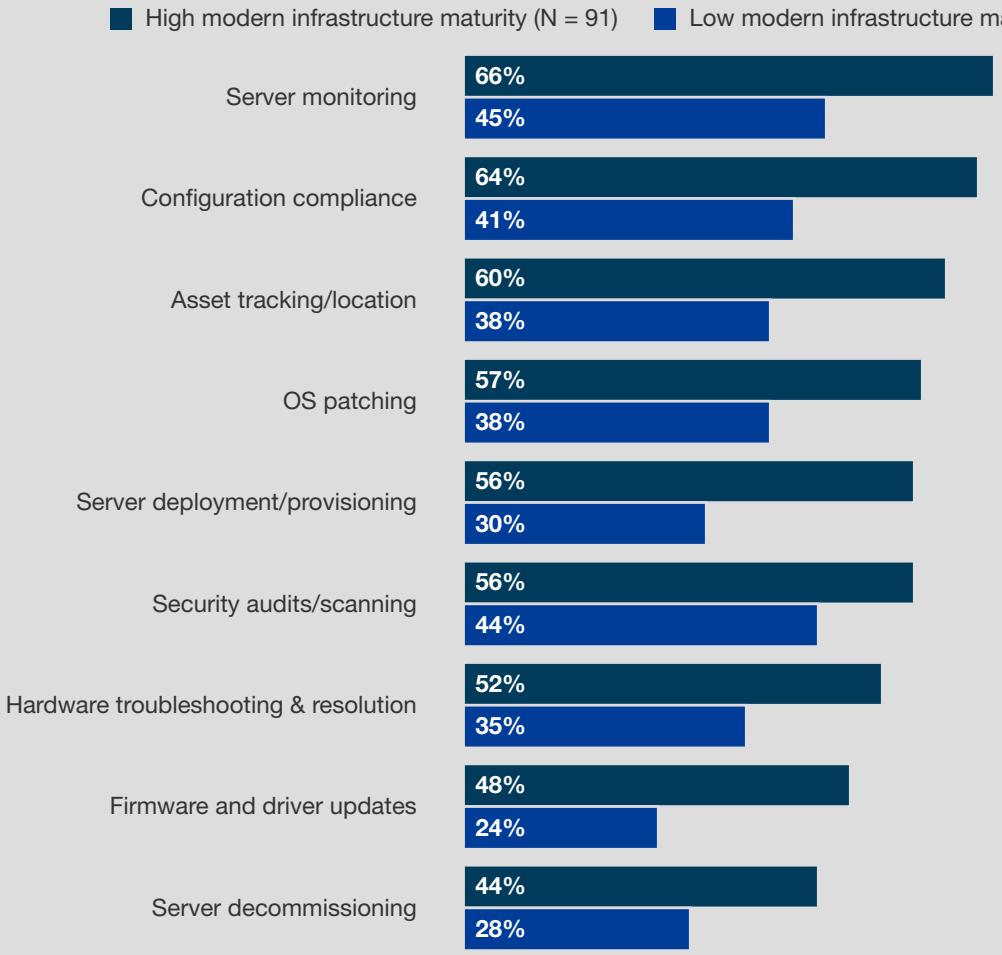
"Good" Or "Excellent" Progress Toward Automating Infrastructure Provisioning, Configuration, And Change Management Tasks



"Extensive" Self-Service Capabilities For The Provisioning Of On-Premises IT Resources



Server Infrastructure Management Tasks That Are "Entirely Automated" Or "More Automated Than Manual"



Base: variable; infrastructure technology purchasing decision makers
Source: A commissioned study conducted by Forrester Consulting on behalf of Dell EMC, June 2018

FORRESTER®

THOSE THAT MORE FULLY MODERNIZE AND AUTOMATE THEIR SERVERS WILL SEE THE BEST RESULTS

A small subset of firms with high modern infrastructure maturity are also mature in their automation. They are more likely to have: made greater automation progress; automated several server management tasks mostly or entirely; and offered self-service capabilities (see Figure 5). We call these firms "Modernized," and they represent the best of what's possible through server infrastructure automation.

Figure 5

Modern Infrastructure Maturity

Defined by:

- Percent of on-premises production servers that are virtual machines
- Workloads entirely or mostly supported by all-flash storage array deployments
- Percent of on-premises applications supported by scale-out storage
- Commitment to SDDC technologies as a long-term strategy
- Percent of on-premises applications supported by converged infrastructure
- Percent of on-premises applications supported by hyperconverged infrastructure
- Number of environments that have data protection solutions deployed

+

Automation Maturity

Defined by:

- Progress toward automating infrastructure provisioning, configuration, and change management tasks
- Number of server infrastructure tasks that are entirely or mostly automated
- Degree of self-service capabilities for provisioning on-premise IT resources

=

Modernized IT

Source: A commissioned study conducted by Forrester Consulting on behalf of Dell EMC, June 2018

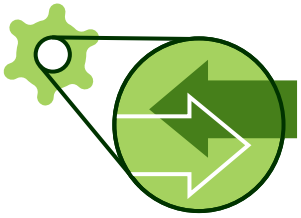
Companies with high modern infrastructure and automation maturity are "Modernized," and those with low maturity are considered to be "Aging."

Modernized firms realize significantly more value from automation than Aging firms.

The white space around Modernized firms today is enormous — just 11% of firms in our research can claim this title. While Modernized firms exist at the intersection of high modern infrastructure and high automation maturity, "Aging" firms — 20% of companies in our sample — are on the other extreme. Their modern infrastructure and automation maturity is low, and so are their benefits (see Figure 6).

Relative to Aging companies, Modernized firms reap considerable rewards in areas key to IT transformation success. Almost two-thirds of Modernized firms report higher systems reliability and faster deployment/delivery of services versus about a third of Aging firms. Modernized firms are also more than twice as likely to cite faster application (57% versus 27%) and system stack updates (56% versus 27%); cost savings across both operating expenditures or opex (44% versus 21%) and capital expenditures or capex (39% versus 19%); and time saved on troubleshooting and remediating issues due to proactive security audits (44% versus 20%) as benefits. Impressively, Modernized firms are also three times more likely than Aging firms to have experienced fewer configuration compliance violations (37% versus 11%).

61% of Modernized firms have higher systems reliability and faster deployments.



57% of Modernized firms have faster application updates.

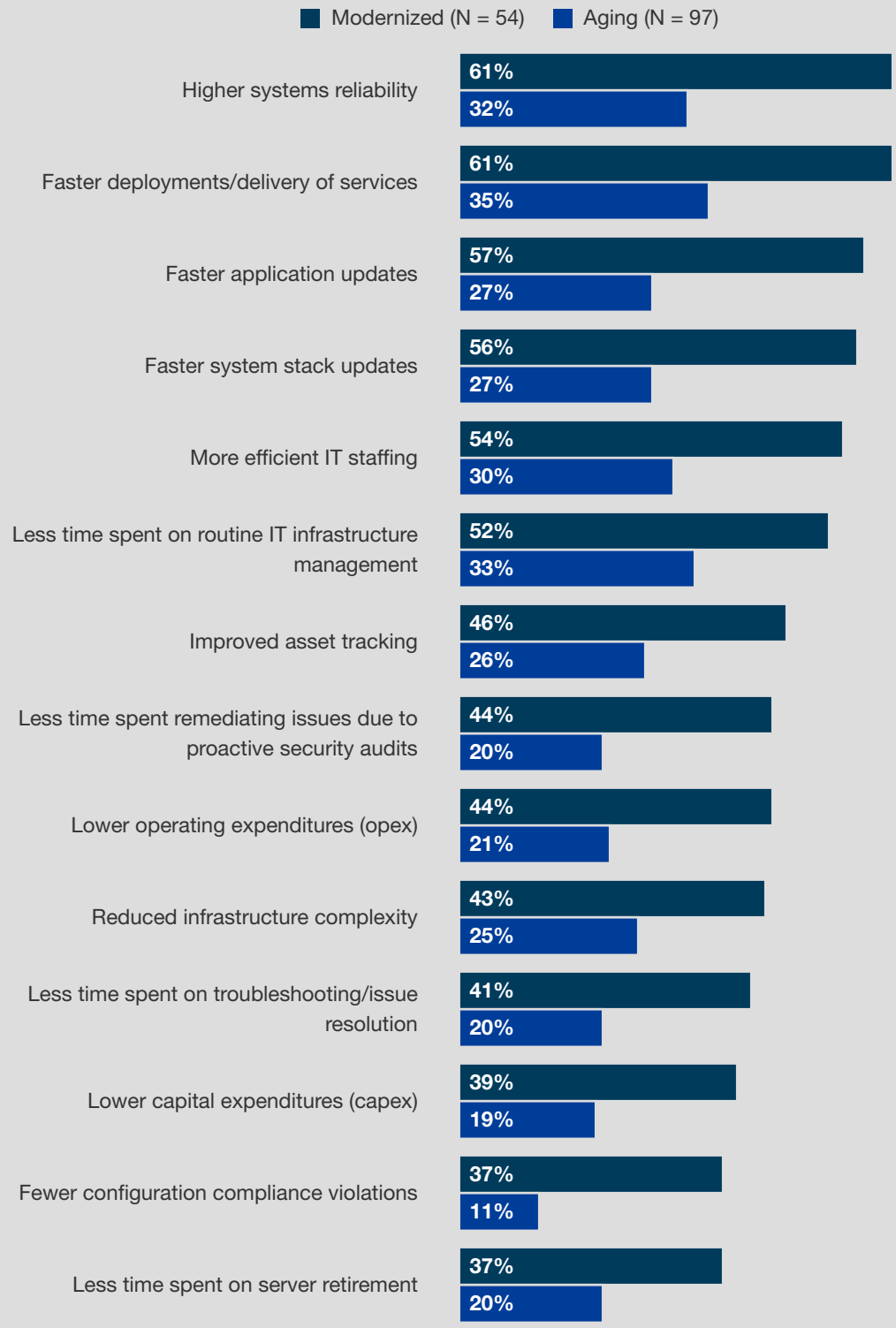
Not only are Modernized firms more likely to experience the benefits we tested relative to Aging firms, they're also more likely to see a greater degree of improvement (see Figure 7). Modernized firms experienced a 21% reduction in service outages related to IT infrastructure versus a 10% reduction among Aging firms. Expenditure savings were also magnified for Modernized firms: 2.3x greater for both opex and capex. Notably, Modernized firms also enjoyed more efficient IT staffing. The percent of time saved on routine, repetitive IT management tasks was 1.5x greater than that of Aging firms, and the percent reduction in IT staff needed to complete such tasks was 2.5x greater.

The good news is, while Aging firms trail far behind, most organizations (69%) are "Modernizing" — in that, they've made moderate progress across both modern infrastructure and automation dimensions. With the right strategy, they are positioned to soon become fully modernized themselves.

Figure 6

Modernized Firms Are Poised For IT Transformation Success

"Which, if any, of the following benefits has your company realized because of IT infrastructure automation?"
(Select all that apply)



Base: variable; infrastructure technology purchasing decision makers
Source: A commissioned study conducted by Forrester Consulting on behalf of Dell EMC, June 2018

FORRESTER®

Figure 7

Modernized Firms Have More Efficient, Agile, And Reliable IT

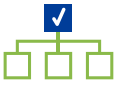
"Please estimate the degree to which the following outcomes have improved as a result of implementing IT infrastructure automation." (Showing average percent improvement)

	Modernized (N = 54)	Aging (N = 97)	Modernized/ Aging improvement
Reduction in service outages related to IT infrastructure	21%	10%	2.1x
Reduction in time spent on routine, repetitive IT management tasks	21%	14%	1.5x
Reduction in opex	16%	7%	2.3x
Reduction of time spent on deployments	13%	8%	1.6x
Reduction of time spent on troubleshooting/ issue resolution	11%	5%	2.2x
Reduction of IT staff needed to complete routine, repetitive IT management tasks	10%	4%	2.5x
Reduction in capex	7%	3%	2.3x

Base: variable; infrastructure technology purchasing decision makers
Source: A commissioned study conducted by Forrester Consulting on behalf of Dell EMC, June 2018

Key Recommendations

Aristotle's phrase, "the whole is greater than the sum of the parts," is sometimes seen as cliché, but in the case of server automation and modernization, it absolutely applies. By achieving a high degree of maturity in both, enterprises achieve a Modernized state that delivers on the promise of their transformation efforts. Forrester's in-depth survey of 500 IT decision makers on this topic yielded several important recommendations:



Start with buy-in from senior leaders. Modernized IT firms were twice as likely to cite senior leadership buy-in as "extremely important" for successful implementation of their server automation strategy. This point is indicative of a deeper truth: Modernized companies understand that they must not only provide support and reliability to lines of business, but they must be an innovation driver for transformation itself. You cannot achieve that without buy-in from the top down.

Modernize your servers as a base. Begin modernizing your IT server infrastructure now; the organizations that are further along in the automation journey cite this fact as being the No.1 thing that they would have done differently. Invest in software-defined compute, storage, and networking. Leverage modern infrastructure abstractions like containers and treat your on-premises infrastructure as a critical component of your hybrid cloud strategy.

Refine IT processes. A bad process automated is still a bad process. Before purchasing automation tools, inventory your workflow around IT infrastructure. Can some manual steps be made more efficient? Are some steps no longer required with modern infrastructure? Can some change management steps be removed as governance becomes code?

Retool your operating model around automation. After investing in modern server technologies and refining your processes, use the opportunity to automate routine server management tasks like deployment, firmware/driver updates, and server decommissioning. Further, take the opportunity outside the infrastructure and operations team and automate security scanning and compliance for the infrastructure itself. Proactively tackling this will ensure you deliver on your transformation promises.

Work with a trusted IT services partner. Modernized IT organizations recognize the importance of a trusted IT services partner to help guide the automation journey. Bringing in a partner also ensures that the automation of IT optimizes your strategy, ensures it is holistic, and smooths out any bumps over the long term.

Appendix A: Methodology

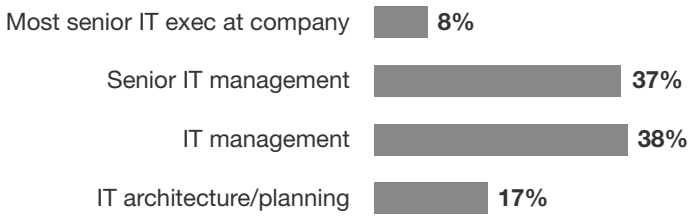
In this study, Forrester conducted an online survey of 500 organizations in the US, the UK, France, Germany, Australia, New Zealand, and China to evaluate their approach to IT server infrastructure automation. Survey participants included IT decision makers at companies with at least 500 employees and $50M in annual revenue, from a range of industries (excluding IT hardware and software). To participate in the study, respondents had to have significant involvement in data storage, servers, networking, virtualization/private cloud, or data protection purchases at their organizations. Questions provided asked about the progress their organizations have made toward IT modernization and automation, tactics they consider important to automation strategies, capabilities around self-service IT provisioning, and benefits they've realized through IT server infrastructure automation. Respondents were offered a small incentive as a thank you for time spent on the survey. The survey fielding began in May 2018 and was completed in June 2018.

Appendix B: Demographics/Data

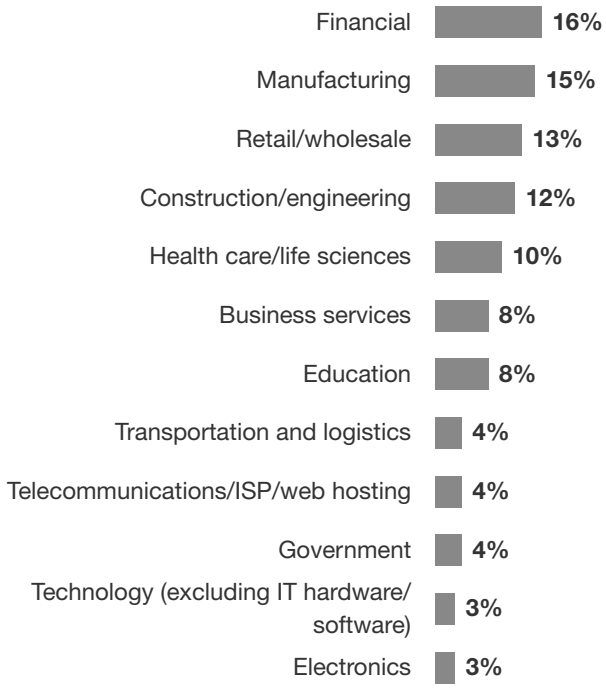
COUNTRY

US	UK	FR	DE	CH	AU	NZ
60%	**7%**	**7%**	**6%**	**10%**	**6%**	**4%**

ROLE/RESPONSIBILITY AREA



INDUSTRY



NUMBER OF EMPLOYEES

23% 500 to 999
26% 1,000 to 2,499
23% 2,500 to 4,999
28% 5,000 or more

REVENUE

34% $50M to $499M
24% $500M to $999M
21% $1B to 4B
20% $5B or more

Base: 500 infrastructure technology purchasing decision makers
Source: A commissioned study conducted by Forrester Consulting on behalf of Dell EMC, June 2018

FORRESTER®

Appendix C: Supplemental Material

RELATED FORRESTER RESEARCH

"Automation Drives The I&O Industrial Revolution," Forrester Research, Inc., November 29, 2017.

"Use Technology To Drive Business Value," Forrester Research, Inc., February 1, 2018.

"Maximize Business Value With Fast, Connected Technology," Forrester Research, Inc., June 22, 2018.

Appendix D: Endnotes

[1] Source: "Maximize Business Value With Fast, Connected Technology," Forrester Research, Inc., June 22, 2018.

[2] Source: "The Software-Defined Data Center Comes Of Age," Forrester Research, Inc., October 30, 2018.

[3] Source: "Automation Drives The I&O Industrial Revolution," Forrester Research, Inc., November 29, 2017.

[4] Source: "Maximize Business Value With Fast, Connected Technology," Forrester Research, Inc., June 22, 2018.

[5] Source: "Automation Drives The I&O Industrial Revolution," Forrester Research, Inc., November 29, 2017.

[6] Source: "Automation Drives The I&O Industrial Revolution," Forrester Research, Inc., November 29, 2017.

[7] Source: "Evolve Or Retire: Administrators Are Now Developers," Forrester Research, Inc., July 13, 2018.

[8] Source: "Seven Recommendations For I&O Leaders Driving DevOps In 2018," Forrester Research, Inc., December 12, 2017.

[9] Source: "CIOs Need To Take The Lead On AI For Transformational Outcomes Across The Company," A Forrester Consulting Thought Leadership Paper Commissioned By Dell EMC, May 2018.

This study was commissioned by Dell EMC. To learn more about Dell EMC PowerEdge servers, visit: www.dellemc.com/servers.