What You Need To Know Before Undertaking Your Virtualization Journey

Why User Experience And Flexible Work Style Are Keys To Deployment

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Executive Summary

Enterprises make the choice to deploy virtual desktops and applications with an expectation of lowering their costs. While cost savings matter, they find that desktop and application virtualization contribute something far more valuable to their companies: Reinventing the way their workers conduct business.

In an era of changing work styles — where workers must be equipped to work in public places, while traveling, when at home, and from personally owned devices — virtualization can offer the flexibility to drive higher levels of worker satisfaction, increased mobility and productivity, and financial returns as well. But these benefits accrue only when virtualization solutions are deployed correctly.

In May 2014, AppSense commissioned Forrester Consulting to evaluate virtualization deployment. Then to further explore this trend, Forrester developed a hypothesis that tested the assertion that end user experience and productivity, not cost, constituted the ultimate benefit for enterprises investing in virtualization.

In conducting in-depth surveys of 300 IT managers and administrators with responsibility for virtual desktop and/or virtual applications, Forrester found that these companies enjoyed benefits to workers, the IT department, and the bottom line in the form of financial performance. Forrester also found that a number of best practices must be followed to achieve the highest levels of success, overcoming common obstacles and challenges associated with deployment.

KEY FINDINGS

Forrester's study yielded several key findings:

› **IT managers think they are deploying virtualization to manage costs . . .** To make the case for deployment, most IT managers focus on lowering costs.

› **. . . but they find that virtualization can be a powerful response to changing work styles.** In an era of mobile workers and bring your own devices (BYOD), virtualization offers a powerful tool set for workforce enablement.

› **User experience is the key to success.** Leveraging virtualization successfully requires buy-in from users. Users are most likely to embrace desktop and application virtualization when the connection is speedy, the

computing environment is familiar, content and applications can be easily transferred from previous environments, and the solution helps them solve customer problems better than they could before.

› **Virtualization efforts often succeed, but proper planning and tools are necessary.** Investing in the right tools and training users are key to deployment success.

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Technology Must Accommodate Changing Work Styles

Today's workers are engineering a revolution in work styles: They're always thinking of new and better ways to work — how to spend less time on things that don't matter and more time on things that do. As a result:

› **The location of work is radically shifting.** Today's employees seek technology that will enable them to work in all the places that they might want to, such as at home, in public places, and when commuting (see Figure 1). For example, while only 11% of global information workers reported working in public places in 2010, 27% said they did so in 2013. Accommodating this mobile workforce must be a goal of every company's technology strategy.[1]

› **Career-focused workers value technology to do their jobs.** Today's employees are very serious about having the best technology to get their jobs done. Some of them are willing to contribute their own money toward the purchase of devices and services to get their jobs done. For employees who describe themselves as putting a lot into their careers, some 42% said they would be willing to contribute their own funds to buy technology for work. If you don't satisfy these employees, they will turn to bring-your-own (BYO) technology to fill the gap (see Figure 2).

› **Engaged workers are actually happier with IT . . .** Engaged workers are those who will invest time and energy in the success of your business, remaining loyal to their companies for a long time and showing a willingness to recommend their employer to others.[2] These are your best employees. Perhaps counterintuitively, engaged workers demand less from IT, showing higher levels of satisfaction.[3] But don't be fooled: These workers have high standards and will fill any gaps in what you provide with BYO technology.

› **. . . and they're passionate about what they do.** Engaged workers are also deeply committed, even taking work home voluntarily. For instance, 77% of software developers said they code on personal time, citing their enjoyment of programming, a wish to keep skills sharp, and doing so as a hobby. To keep these engaged workers happy, you don't want to hamstring them with hard-to-use, onerous technology that doesn't travel well to their personal devices.

FIGURE 1

Flexible Work Styles Are On The Rise
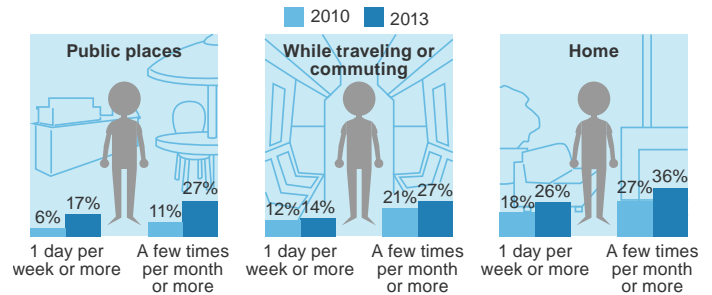
Base: 5,519 global information workers

†Base: 9,766 global information workers

Source: "Habitat For Engagement: Unleash Workforce Potential With Agile Enablement," Forrester Research, Inc., May 10, 2013

Virtualization deployments should not constrain engaged workers. Instead, they should empower flexible work styles, allowing workers to work when they want, where they want, and from the devices they want without sacrificing user experience.

WHAT ENGAGED WORKERS WANT FROM YOU

So how can you satisfy these engaged workers with their evolving work styles? What do they seek from you? Your technology strategy should help empower them with:

› **Better access to information.** Technology needs to provide workers the best possible access to the information they need when they need it. For customer-facing employees, the entire customer experience can hinge upon whether or not a worker can summon the right information during the interaction.

› **Tools to serve their customers.** Workers also need access to key applications and systems to act on the information they receive, solving customer problems.

› **Adaptability to changing conditions.** Workers also value knowing that the technology they have to do their jobs won't become antiquated in the face of changing business realities or during travel.

› **Flexibility and autonomy.** Finally, workers value the ability to make at least some of their own choices about the technology they use. They want flexible tools and the permission to make autonomous decisions about how and where they do their work.

FIGURE 2

Technology Should Empower Engaged Workers

Engaged workers create value for your business

• Career-focused people are willing to spend their own money on technology to help them do their jobs.
• Engaged workers are actually *more* satisfied with IT than are disengaged workers.
• The intrinsic motivation enjoyed by engaged workers leads to better customer service and customer experiences.
• Engaged workers are passionate. For example, 77% of software developers code on their own time as well as at work.

Source: Forrester Research, Inc.

WHAT WORKERS REALLY NEED FROM YOU: AN EXCELLENT USER EXPERIENCE

To solve these problems, organizations can turn to desktop and application virtualization. To understand the deployment journey for virtualization, we surveyed 300 IT managers and administrators with responsibility for virtual desktop and/or virtual applications.

Survey respondents wrote in comments about the challenges they faced with their deployments. "User resistance," "user satisfaction," and "user training" all came up — sometimes more than once. "People hated it," wrote one IT manager from a manufacturing vertical company. Another summed up the challenge with a single word: "truculence," indicating that users were easily annoyed or angered and likely to argue.

What accounts for these challenges with desktop and application virtualization? Often the answer lies in user experience. User experience encompasses the perceptions and behaviors resulting from a given computing solution; it's a measure of how successfully people can use the tools

they are given. In virtualization deployments, user experience encompasses:

› **Speed and stability of access.** Overall performance needs to be snappy for users to embrace virtual desktops and applications. IT managers in our survey cited "speed" and "performance" as write-in descriptions of their challenges on more than one occasion.

› **Familiarity.** Users will lose productivity — and confidence in the solution — if the computing environment isn't familiar and relatively stable. IT managers cited "amount of time to initially gain confidence of users" and "learning curve" as challenges related to this issue.

› **Transferability.** Virtualization deployments must effectively migrate older assets (files, data) and applications to a new environment for users to thrive. IT managers often mentioned "integration" and "migration" as challenges that exceeded their expectations during deployment.

› **Success with customers.** Virtual desktops and applications have to ultimately help workers achieve their aims. For your employees to create a great experience for your company's customers, they need to have tools that effectively help them do their jobs. In that sense, user experience significantly affects customer experience.

Word of the day: "Truculence." Definition: State of being easily annoyed or angered, and likely to argue.

Relevance: How one survey respondent from a retail company described the challenge his company faced from users when the company deployed virtualization — presumably with a poor user experience.

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# The Virtualization Journey Starts With Costs — But Ends With User Experience

We asked IT managers what drove their decision to deploy desktop and application virtualization. They cited a long tail of reasons that can be grouped into a few categories:

› **Lowering costs.** Leading the list of drivers is reducing costs; 33% of IT managers listed this motive as a primary driver of their virtualization efforts. Though it's far and away the top motive, many enterprises find it difficult to get reliable information on operational costs during the planning process.[4]

› **Improving IT performance.** IT managers also cited a host of IT-related drivers, including better security, improving manageability, disaster recovery, and supporting Macs and tablets (see Figure 4).

› **Empowering employees.** A minority of IT managers also thought of virtualization as a workforce enabler, with 10% citing the provision of flexible remote access and 8% indicating work-from-anywhere scenarios as motives.

FIGURE 3

Interest In Virtualization Continues To Grow

Survey respondents who said that implementing or expanding the use of desktop virtualization, thin client, and application streaming technologies is a high or critical priority.
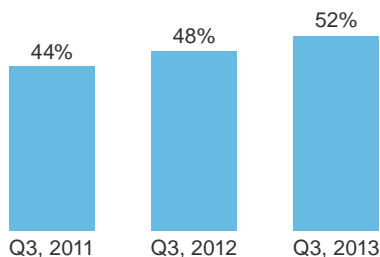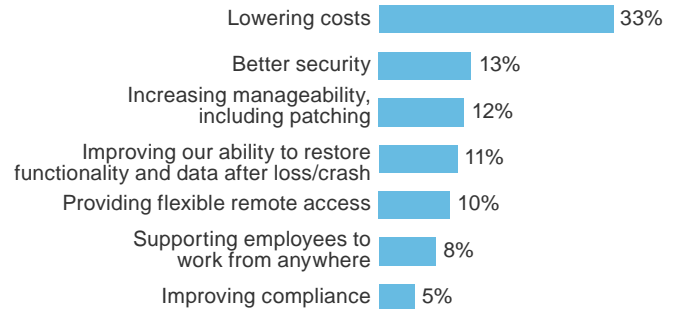
Base: US and European hardware decision-makers

Source: David Johnson, "Citrix Acquires Framehawk, Bolsters Enterprise and DaaS Portfolios," David Johnson's Blog, January 8, 2014

FIGURE 4

IT Managers Initially Focus On Cost To Drive The Case For Virtualization

"What were your primary drivers for migrating to a virtualized environment?"

Lowering costs	33%
Better security	13%
Increasing manageability, including patching	12%
Improving our ability to restore functionality and data after loss/crash	11%
Providing flexible remote access	10%
Supporting employees to work from anywhere	8%
Improving compliance	5%

Base: 300 IT managers/administrators with responsibility for virtual desktop/application environments at 1,000+ employee firms

(multiple responses accepted; percentages rounded)

Source: A commissioned study conducted by Forrester Consulting on behalf of AppSense, June 2014

VIRTUALIZATION RESULTS IN FAR MORE WORKER BENEFITS THAN ORIGINALLY ANTICIPATED

IT managers might have focused on cost reductions and improved IT performance when they chose to deploy virtualization, but the outcomes they saw were quite different. In many ways, the business outcomes for their companies flip the original rationale on its head:

› **End user productivity improved greatly.** The top outcome of virtualization deployments? Increased productivity for workers while working remotely across multiple devices, at 51% (see Figure 5). Recall that only 18% had cited this scenario as an original motive for adoption. Ultimately, virtualization can support the needs of the flexible workforce when properly deployed.

› **Virtualization often increased worker satisfaction.** A large group of IT managers (39%) said that end user satisfaction with the computing environment increased, running contrary to some stereotypes about the user experience of virtualization. Another 34% said that employees have the ability to work more effectively on their personally owned devices, thereby supporting a BYO strategy as well. Workers benefited in both cases.

› **Of course, there are traditional IT benefits as well.** Enterprises also frequently achieved some of the IT-related outcomes they sought. Some 46% said that faster

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incident solution resulted from deployment, while faster disaster recovery (41%), faster boot to a Windows desktop environment (40%), and better security (29%) also entered the list.

The bottom line: In many cases, virtualization offered a win-win for workers and for IT.

HOW TO MEASURE THE RESULTS OF VIRTUALIZATION

Ultimately, companies that adopt virtualization come to recognize that the true value of their deployments sits with workforce enablement. They employ a mix of metrics to measure success, including:

› **End user satisfaction . . .** In the end, it's all about how workers feel about the tools they are given, and 60% of IT managers said this is a top metric for success (see Figure 6). Surveying your employees, holding focus groups, and keeping an open door policy on feedback all help here.

› **. . . and end user experience metrics.** Related, 54% said that end user experience metrics, such as application launch times, rendering speeds, and other performance measures, are critical success factors as well.

› **IT help desk incidents.** IT's interests matter here as well, with 54% saying that Windows desktop and application-related operational costs figure into their measures of success.

› **Desktop management and related operational costs.** Costs still play a key role, with 52% citing them as a top metric for measuring success.
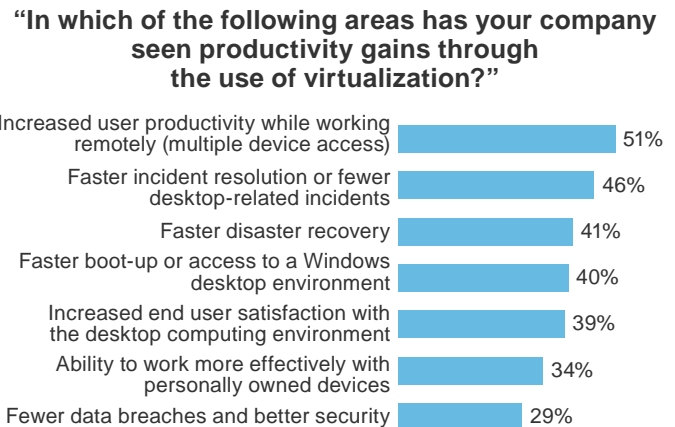
CUSTOMER EXPERIENCE — WHEN IT'S DONE RIGHT

The best virtualization deployments will create business value by helping employees do things they couldn't do before. Two examples come from firms in:

› **Aerospace.** An aerospace manufacturer wanted its field workers and factory floor employees to have better tools than their existing static PDF files. By equipping these workers with Apple iPads with virtual desktops, the company empowered them to disassemble an airplane virtually before they did so physically. This innovation led to fewer errors and higher productivity, eliminating lag times in which floor workers would have to stop working to seek answers from engineers.

FIGURE 5

Virtualization Yields Worker Benefits, Not Just IT Benefits

"In which of the following areas has your company seen productivity gains through the use of virtualization?"

Increased user productivity while working remotely (multiple device access)	51%
Faster incident resolution or fewer desktop-related incidents	46%
Faster disaster recovery	41%
Faster boot-up or access to a Windows desktop environment	40%
Increased end user satisfaction with the desktop computing environment	39%
Ability to work more effectively with personally owned devices	34%
Fewer data breaches and better security	29%

Base: 300 IT managers/administrators with responsibility for virtual desktop/application environments at 1,000+ employee firms

(multiple responses accepted)

Source: A commissioned study conducted by Forrester Consulting on behalf of AppSense, June 2014

FIGURE 6

Organizations Measure The Success Of Virtualization Via Worker Satisfaction

"What top metrics do you use to measure the success of your virtualization deployment?"

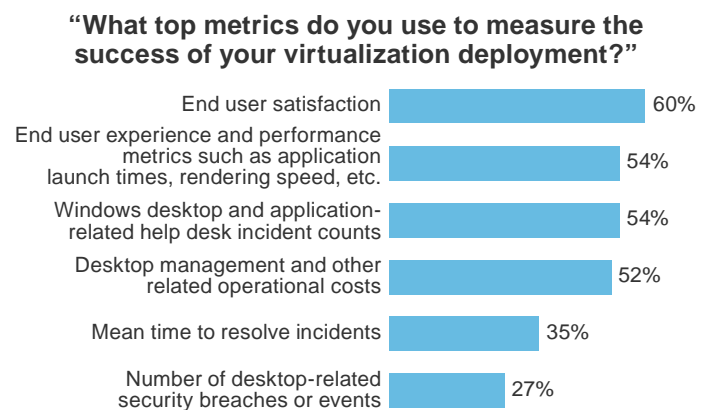|	
End user satisfaction	60%
End user experience and performance metrics such as application launch times, rendering speed, etc.	54%
Windows desktop and application-related help desk incident counts	54%
Desktop management and other related operational costs	52%
Mean time to resolve incidents	35%
Number of desktop-related security breaches or events	27%

Base: 300 IT managers/administrators with responsibility for virtual desktop/application environments at 1,000+ employee firms

(multiple responses accepted)

Source: A commissioned study conducted by Forrester Consulting on behalf of AppSense, June 2014

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› **Healthcare.** A hospital implemented virtual desktop in lieu of traditional laptops. Doctors are highly mobile workers and need to log in to health records from every patient's room, as well as from their offices and from home. With virtualization, physicians could move from place to place and still encounter a familiar computing environment, eliminating the need to figure out the context of every new machine. Productivity increased and patients received a better customer experience.

Begin The Virtualization Journey With The End In Mind

So the benefits to users, IT, and the bottom line are all clear. But don't think virtualization will be an easy journey. Our survey respondents suggest that it's important to go in with eyes wide open:

› **Over a quarter of you will go over budget.** Although 61% said their deployments occurred on budget, 28% said they went above budget — compared with 8% who came in under budget. One reason? Different use cases have vastly different cost models. Call center employees, stock traders, and doctors traveling from room to room in a hospital all have very different needs for a virtual desktop or application system than engineers, sales reps, or graphics designers. Other business requirements, such as support for videoconferencing, dictation software, and mobility platforms, will all drive different choices in hardware and performance options and in turn affect operational costs. Sometimes these factors aren't fully accounted for in advance planning.

› **You will only convert about three-quarters of the users you planned due to fierce upfront resistance.** Survey respondents wrote in messages such as "stubborn users who refused to switch" and "lack of adoption by end users" as sources of implementation headaches. In fact, 22% of IT managers said they had to roll back at least some users after migration to virtual desktops.

› **It will be harder than you expect.** As with any complex migration, expect the unexpected. Survey respondents cited complexity in migrating applications, incomplete initial user training that had to be redone, and network speed challenges related to the off-site desktop virtualization servers as bumps in the road for which they hadn't fully planned.

PREVENT CHALLENGES WITH ADVANCE PLANNING

With expectations appropriately set, you can now avoid some of the pitfalls experienced by others. Be sure to prevent these common challenges by taking a strategic approach to deployment:

› **Application performance is the leading challenge.** For both desktop and application virtualization, IT managers cited application performance as their top deployment challenge (see Figure 7). The desktops that used to be a few inches from users' fingers, with zero latency issues, might now be 2,500 miles away in a data center — and might suffer from degraded performance or may not be available at all if their network connectivity is poor.

Solution: Invest in newer tools and infrastructure to handle the transition. This best practice is cited by 40% of IT managers when asked what they would do differently if they had to deploy virtualization again (see Figure 8).

› **Overprovisioning is common.** Overprovisioning — making more images to accommodate various user profiles — ranks high as a challenge as well. Related, server density — not having as many users on a server as expected — also presents a stumbling block. In both cases, better advance planning can help.

Solution: In addition to investing in newer tools and infrastructure, one possible solution is to hire a partner to manage the deployment — something a quarter of IT managers wish they had done.

› **User acceptance requires patience and effort.** Some 75% of IT managers cited user acceptance testing as a roadblock during their deployments, in addition to the 22% who experienced users who demanded to be rolled back. Building trust and knowledge among workers is a key success factor for virtualization deployment projects.

Solution: Invest in more education. Over a third of IT managers said that they would do this if they could start their deployment from scratch. Invest in tools that will provide the best user experience. This includes technology that can give users a familiar environment, such as user environment management, and tools that monitor and ensure maximum application performance.

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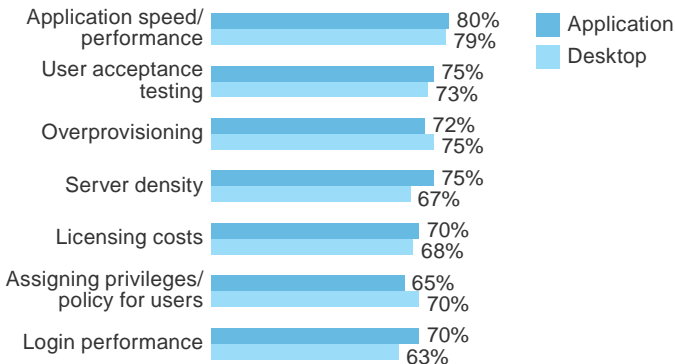> **Organizational challenges require a new structure.**
Too often, deployment projects are led in a siloed fashion by either the data center team or the desktop team. These groups tend to ignore user experience. When desktop teams lead the client virtualization project, they tend to think about end user experience and access as well as how to manage the virtual desktops across widely distributed geographies — but they usually fail to consider critical data center items such as how server capacity will be monitored and expanded, how network segments need to be routed for roaming users, and data backup and recovery needs.

Solution: Create a dedicated virtualization team as an overlay on existing server, network, and storage teams. Nearly half of IT managers wish they had done so. Why? Client virtualization initiatives require cross-team and cross-technology collaboration. Instead, you should assemble a cross-functional virtualization team to ensure focus on the agreed-upon goals; define the priorities; define the use cases and architecture; keep the project moving; drive collaboration; make key platform, tool, and process decisions; and communicate with stakeholders and executive leadership.

Challenge: "Inability to get end users to test the solution. Initial buy-in was high, but few business units would commit resources to ensure proper testing, making successful migration extremely difficult."

— IT leader at a financial services company

FIGURE 7

Application Performance Is The Leading Challenge For Deployment

"On a scale of 1 to 5, how significant were the following challenges when deploying your *desktop and application* virtualization?"

Challenge	Application	Desktop
Application speed/performance	80%	79%
User acceptance testing	75%	73%
Overprovisioning	72%	75%
Server density	75%	67%
Licensing costs	70%	68%
Assigning privileges/policy for users	65%	70%
Login performance	70%	63%

Base: 261 IT managers/administrators with responsibility for virtual desktop/application environments at 1,000+ employee firms

(multiple responses accepted)

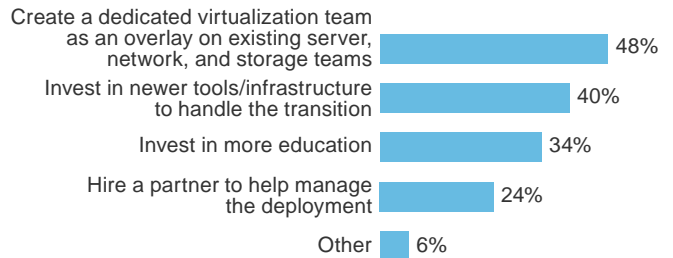Source: A commissioned study conducted by Forrester Consulting on behalf of AppSense, June 2014

FIGURE 8

If They Could Do It Over, Many Would Create A Virtualization Team

"If you had to redo your migration, what would you do differently?"

Create a dedicated virtualization team as an overlay on existing server, network, and storage teams	48%
Invest in newer tools/infrastructure to handle the transition	40%
Invest in more education	34%
Hire a partner to help manage the deployment	24%
Other	6%

Base: 300 IT managers/administrators with responsibility for virtual desktop/application environments at 1,000+ employee firms

(multiple responses accepted)

Source: A commissioned study conducted by Forrester Consulting on behalf of AppSense, June 2014

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Challenge: "We have faced Internet speed challenges related to the off-site servers. Particularly when running some more advanced modeling software housed externally."

— IT leader at a financial services firm

ULTIMATELY, YOU'RE LIKELY TO SUCCEED

Despite these travails, most IT managers reported eventual success with their deployments:

› **Some 70% are satisfied with the financial returns.** Financial return on investment is widely praised, with 24% reporting they are "very satisfied" and another 46% "satisfied" — 70% in total. Just 22% are "neutral" in their assessment, while only 8% felt disappointed in the financial outcome of their deployment.

› **Applications are responsive.** Despite the initial challenges associated with application speed, 40% reported that application speed and responsiveness are at least somewhat quicker since their deployment of virtual desktops. Another 38% said they equal their previrtualized computing environment.

› **User logins are (sometimes) up.** The ultimate mark of worker satisfaction is usage. Respondents reported that, ultimately, logins were up among 25% of their users, while 55% stayed the same. On the flip side, 16% of users log in somewhat less often, and 4% log in infrequently. This data suggests that, on balance, increased usage outweighs disengagement — a reminder that you're likely to find success but that you must follow some best practices to do so.

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Key Recommendations

An analysis of Forrester's in-depth surveys of IT executives responsible for desktop and application virtualization initiatives yielded several important observations:

›   **Make the user experience your prime objective.** As most IT managers wind up learning, the value of virtualization comes from improved workforce enablement, not primarily from a reduction in cost. Put employee use cases first when building the plan. And don't pinch pennies where user experience would be compromised — trading the productivity of the organization as a whole for small gains in IT efficiency is a false economy. Let the usability requirements dictate the architecture, and run the operational cost analysis from there.

›   **Invest in better tools.** With user experience in mind, choose tools that will boost application performance, including faster networks, shared graphics processing units (GPUs), and WAN optimization. Fundamentals still matter, so be generous in your server density planning and invest in tools that will make managing profiles, privileges, and policies easier. Finally, invest in areas that will accelerate user acceptance, such as application and personality persistence, elevated rights management technology for installing software, and employee self-service.

›   **Put together an overlay team to deploy.** This team should at a minimum consist of a product or service manager or owner, an architect, and a program manager, and should cover the competencies of desktop, server, network, and storage. If you're planning custom development work, you should seriously consider an execution owner. Hold the core team members accountable for the quality of their work in each phase of the project, alignment with executive and key stakeholder objectives, and meeting project milestones and commitments.

›   **Bring in a partner to educate and help.** Educating users and empowering them with the tools you have chosen will increase user acceptance and drive flexible work styles throughout your organization. If training isn't a core competency in your company, bring in a partner to communicate, teach, and evangelize.

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Appendix A: Methodology

In this study, Forrester conducted an online survey of 300 IT managers and administrators with responsibility for virtual desktop and/or virtual application environments at 1,000+ employee firms in the United States, the United Kingdom, and Germany. Questions provided to the participants asked about their experiences deploying virtualization, how they measure success, what they wish they could do differently, and how their organizations benefit from virtualization. The study began in May 2014 and was completed in June 2014.

Appendix B: Supplemental Material

RELATED FORRESTER RESEARCH

"Build Digital Workspace Delivery Systems To Give Employees The Right Tools For Their Job," Forrester Research, Inc., April 17, 2014

"Benchmarking Technology's Effect On Employee Engagement," Forrester Research, Inc., July 30, 2013

"Habitat For Engagement: Unleash Workforce Potential With Agile Enablement," Forrester Research, May 10, 2013

"Hosted Virtual Desktops Versus Physical PCs: Understanding The Operational Cost Differences," Forrester Research, Inc., January 3, 2013
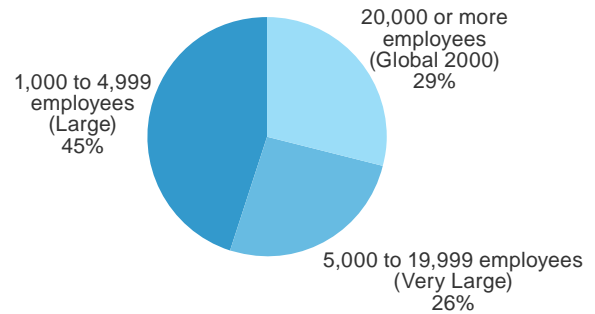
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Appendix C: Demographics/Data
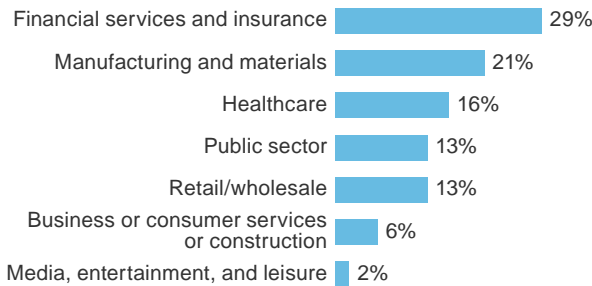
FIGURE 9

Composition Of Survey Population
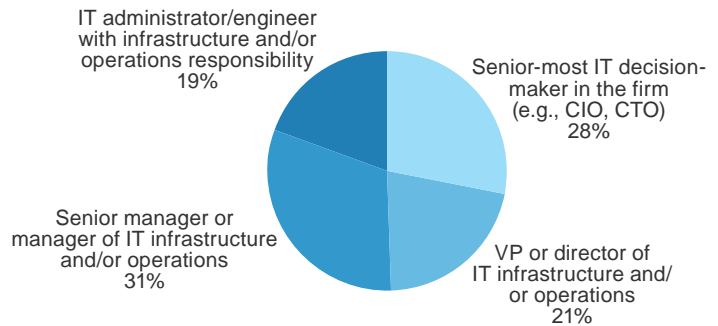
"In which country do you primarily work?"

Germany
12%

United Kingdom
18%

United States
70%
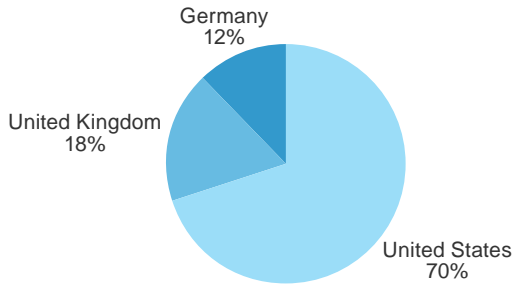
"Using your best estimate, how many employees work for your firm/organization worldwide?"

20,000 or more employees (Global 2000)
29%

1,000 to 4,999 employees (Large)
45%

5,000 to 19,999 employees (Very Large)
26%

"Which of the following best describes the industry to which your company belongs?"

Financial services and insurance	29%
Manufacturing and materials	21%
Healthcare	16%
Public sector	13%
Retail/wholesale	13%
Business or consumer services or construction	6%
Media, entertainment, and leisure	2%

"Which title best describes your position at your organization?"

IT administrator/engineer with infrastructure and/or operations responsibility
19%

Senior-most IT decision-maker in the firm (e.g., CIO, CTO)
28%

Senior manager or manager of IT infrastructure and/or operations
31%

VP or director of IT infrastructure and/or operations
21%

"Please indicate your company's experience with desktop/application virtualization."

We have used desktop and/or application virtualization for less than a year
9%

We have used desktop and/or application virtualization for 3+ years
48%

We have used desktop and/or application virtualization for 1 to 3 years
43%
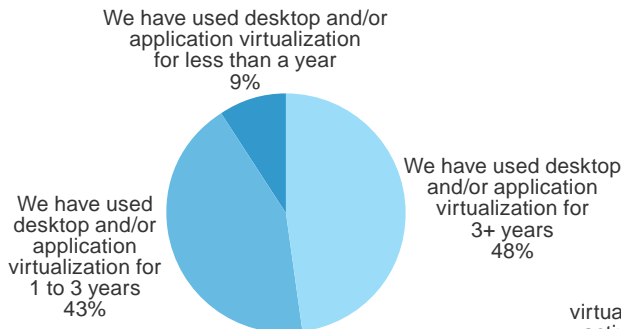
"Please indicate your level of responsibility for virtualization in your company."
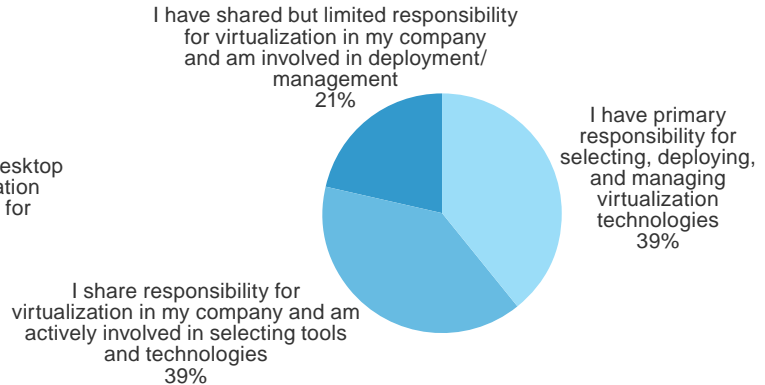
I have shared but limited responsibility for virtualization in my company and am involved in deployment/management
21%

I have primary responsibility for selecting, deploying, and managing virtualization technologies
39%

I share responsibility for virtualization in my company and am actively involved in selecting tools and technologies
39%

Base: 300 IT managers/administrators with responsibility for virtual desktop/application environments at 1,000+ employee firms. Percentages rounded.

Source: A commissioned study conducted by Forrester Consulting on behalf of AppSense, June, 2014

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Appendix D: Endnotes

[1] Source: "Habitat For Engagement: Unleash Workforce Potential With Agile Enablement," Forrester Research, May 10, 2013.

[2] Source: "Benchmarking Technology's Effect On Employee Engagement," July 30, 2013.

[3] Source: "Habitat For Engagement: Unleash Workforce Potential With Agile Enablement," Forrester Research, May 10, 2013.

[4] Source: "Hosted Virtual Desktops Versus Physical PCs: Understanding The Operational Cost Differences," January 3, 2013.

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