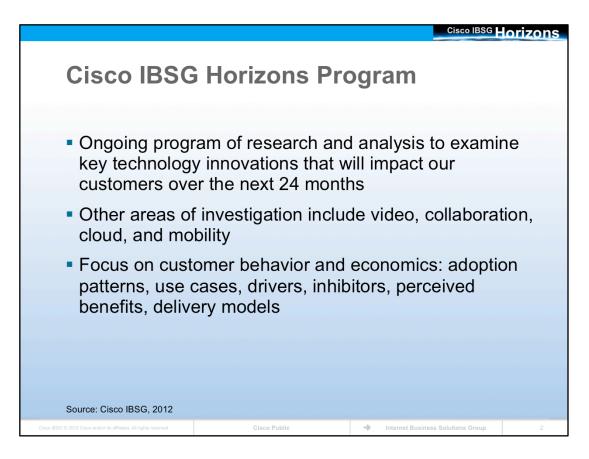
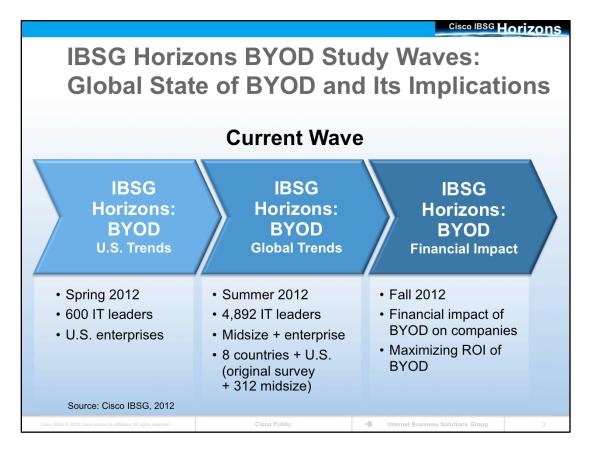


- Companies are now in a post-PC world, where the network must accommodate new choices at every layer of the stack. These include traditional, mobile, and social applications; multiple operating systems; various server architectures; and mobile devices ranging from tablets to smartphones and other mobility tools.
- The Cisco Internet Business Solutions Group (IBSG) has conducted extensive research and analysis to uncover key insights about the various devices entering the network and how companies are dealing with them.
- In this study, we use the term "bring your own device" (BYOD). You will also hear the terms "consumerization" or "consumerization of IT." BYOD and consumerization both refer to the use of personal mobile devices connected directly or remotely to an enterprise network.
- The study was global in scope, covering nine countries across four continents. This presentation includes the global data, with an emphasis on India.
- The presentation is modular. Please use any of these slides in other presentations, or reorder them to fit your needs.

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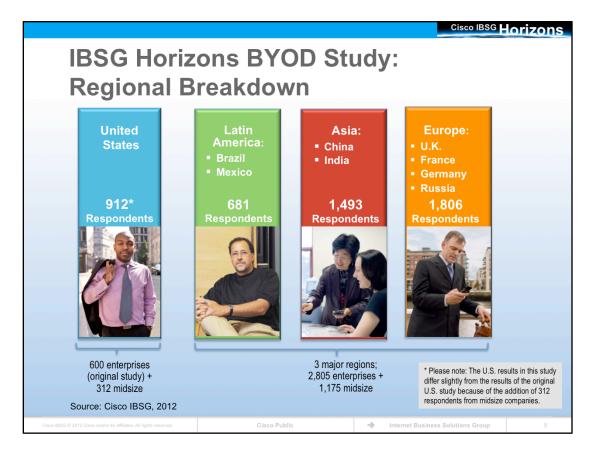
- This study is part of the Cisco IBSG Horizons program, an ongoing research and analysis program designed to identify business transformation opportunities fueled by technology innovation.
- In addition to "bring your own device" (BYOD), we are looking at enterprise video, collaboration, and cloud computing, and examining trends, use cases, adoption patterns, lessons learned, and financial impacts.
- Focusing on the link between a customer's technology environment and business strategy, the Horizons program accelerates the success of Cisco customers by identifying transformative, network-enabled strategies and analyzing their economic underpinnings.



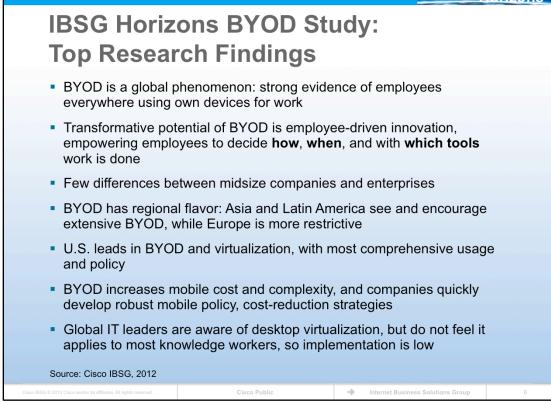
- This study is the second of three planned waves of Cisco IBSG Horizons BYOD research.
- In the spring of 2012, we surveyed 600 IT decision makers in U.S. enterprises to determine how prevalent BYOD is in enterprises, and how corporate IT departments are handling these new devices in terms of support, network access, and security. We also wanted to know whether corporate IT is supportive, indifferent, or hostile toward BYOD.
- When we saw the surprising degree to which U.S. enterprises had embraced BYOD, and their expectations for greater employee productivity and employee-led innovation, we wanted to know whether other countries, as well as smaller companies, were responding in the same way.
- So Cisco IBSG expanded its original study to include IT decision makers in both enterprises (1,000 or more employees) and midsize companies (500-999 employees) in eight countries across three regions. We also added over 300 IT decision makers from U.S. midsize firms to our initial 600 enterprise respondents. This is the current wave of research.
- In the fall of 2012, we will release a third wave of Horizons BYOD research that will focus on the financial impact of BYOD on companies, and opportunities for maximizing the benefits of BYOD.



- Overall, we surveyed nearly 4,900 IT leaders who were decision makers or influencers of their companies' mobility solutions.
- Our respondents represented:
 - CIOs, senior vice presidents, vice presidents, directors, and managers
 - About 70 percent were director or higher
- These leaders came from 18 industries, including:
 - Banking and financial services, construction, education, public sector, healthcare, hospitality, information and media, insurance, manufacturing, oil and gas, life sciences, professional services, retail, technology, telecommunications, transportation, utilities, and wholesale distribution

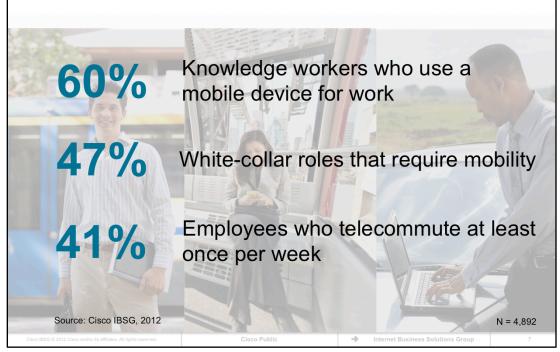


- The study's respondents came from the following regions and countries:
 - The United States
 - Latin America: Brazil and Mexico
 - Asia: China and India
 - Europe: the United Kingdom, France, Germany, and Russia
- This range of countries and the number of and seniority of respondents was selected to determine whether BYOD is a trend that crosses geographies and cultures. We also wanted to detect any meaningful regional differences.



- Our study confirmed that BYOD a global phenomenon: Consistent with the original U.S. study, we found strong evidence of employees using their own devices for work around the world.
- We found that BYOD is not simply about device usage, but freedom and innovation. BYOD empowers employees to innovate using the tools with which they are most comfortable—how and when they want to work.
- There are few differences between midsize companies and enterprises in the rate of adoption or perceived benefits of BYOD.
- Attitudes toward BYOD vary significantly by region: countries such as Brazil, China, India, and Mexico see—and encourage—extensive BYOD, while Europe is more cautious and restrictive.
- We also found that as BYOD becomes more commonplace, companies need to respond with more robust mobile policies and cost-containment strategies, or escalating complexity and costs could threaten some of the gains.
- BYOD also implies new challenges in security.
- We also wondered if desktop virtualization would keep pace with the growing BYOD trend. We found that global IT leaders are aware of desktop virtualization, but implementation is lagging, perhaps because respondents were much more uncertain about its applicability to knowledge workers than in the United States.

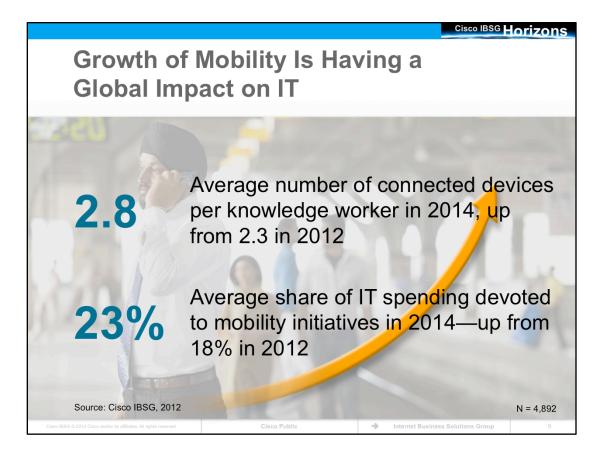
Around the World, Mobility Is Pervasive



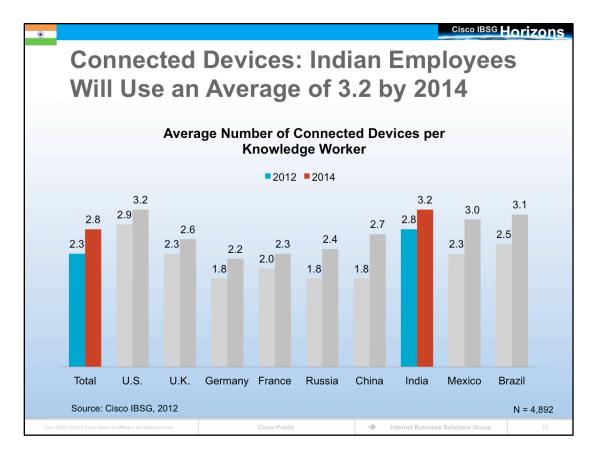
- Mobility means to work away from a traditional office or fixed location on a regular basis.
- Because mobility is pervasive in companies today, the reality is that mobile devices are becoming necessary tools for employees to get their work done.
- 60 percent of employees—by which we mean knowledge workers or whitecollar workers—in the companies Cisco surveyed use mobile tools to accomplish their work. These include laptops, smartphones, tablets, and other wireless devices.
- Interestingly, only 47 percent are officially designated as "mobile workers." Companies are finding that their employees want to use mobile devices to perform their work, even if these devices are not strictly needed for their job roles. In other words, mobility is becoming vital for a wider range of jobs.
- In addition, more than 40 percent of all employees telecommute at least one day per week. The flexibility to move from home to office, and stay connected on the road, is provided by mobile devices.



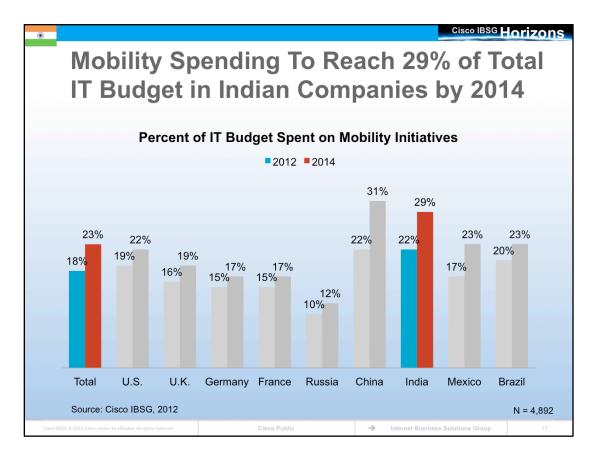
- Overall, India has the highest percentage of knowledge workers who use a mobile device to do their jobs, just ahead of the United States.
- Knowledge workers at Indian enterprises are more likely to be mobile than those who work in midsize firms (71 percent compared to 64 percent).
- China and Mexico are not far behind India and the United States.
- On the other hand, in Germany and France, just over half of knowledge workers use mobile devices. We shall see throughout the research findings that European nations, while they see strong usage of mobility in general and BYOD in particular, are behind other countries in perceiving and embracing these trends.



- Employees' need or desire to be mobile and connect to the company network remotely is driving the growth of smartphones, tablets, and other mobile devices.
- The proliferation of these mobile devices in companies is a fact of life, and this means IT needs to change the way it manages devices. This growth in mobility affects data security, access control, platform maintenance, application support, and much more.
- In 2012, knowledge workers had an average of 2.3 devices connected to the network, including smartphones, laptops, tablets, desktops, and so on.
- By 2014, this number will rise to 2.8 mobile devices per knowledge worker.
- This growth in mobile devices will have a profound impact on IT support and network loads. The IT leaders in this study expect the share of IT spending on mobile devices to grow from 18 percent in 2012 to 23 percent by 2014.



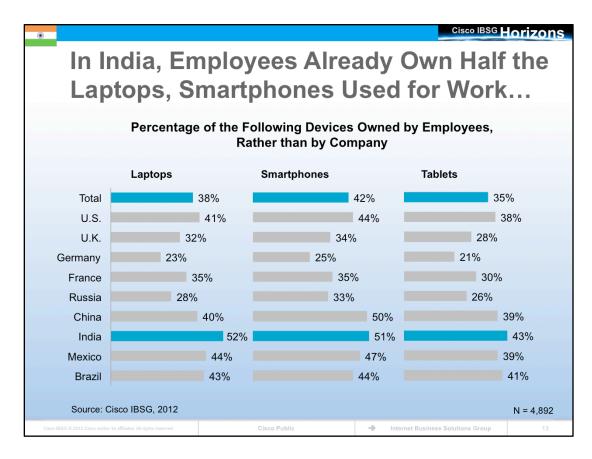
• At 2.8 devices per knowledge worker connecting to the company network, Indian firms are already supporting one of the highest device-to-employee ratios (only second to that in the United States). While the growth rate is expected to be modest compared to the other BRIC countries (Brazil, Russia, and China), India and the United States will lead the world, with 3.2 devices per knowledge worker, by 2014.



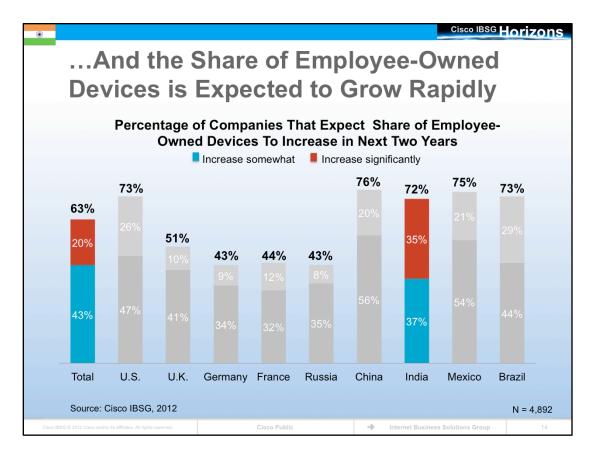
- The number of mobile devices connecting to corporate networks by 2014 in India, Brazil, Mexico, and China will have profound effects on mobility budgets. China and India already spend a high percentage of their IT budgets on mobility. Nevertheless, mobility as a share of IT will increase to 31 percent and 29 percent, respectively.
- On average, mobility as a percentage of IT spending is slated to reach 23 percent.



- A large and growing share of the mobile devices employees use for work are owned by employees personally. For example, 42 percent of smartphones and 38 percent of laptops are employee-owned. This shows that BYOD, far from being an emerging trend, is already well-entrenched in corporations throughout the world.
- And IT leaders see strong growth for BYOD in the next two years, with 63
 percent saying they expect the percentage of employee-owned devices to
 increase.



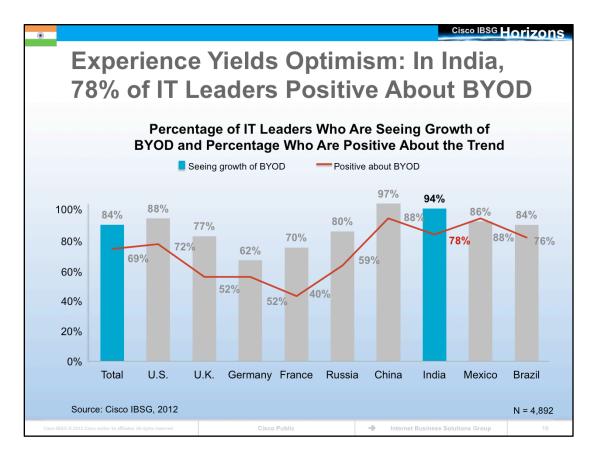
- Indian employees are providing the majority of the laptops and smartphones that are used for work purposes today; no other country surveyed has approached this level of BYOD penetration.
- In comparison, European countries are far behind. In Germany, for example, IT leaders see only about half of the BYOD adoption of India. As we shall see, the wariness of European IT leaders and more restrictive IT policies among European companies, including prohibitions on BYOD or lower levels of support, explain some of the difference.



- 72 percent of IT leaders in India expect that employee-owned devices will continue to replace company-issued ones for use in the workplace, a trend that is affirmed in the other BRIC countries, Mexico, and the United States.
- Of special note is the high percentage of IT decision makers who say BYOD increases will be "significant": 35 percent in India, where more than half of smartphones and laptops are already employee-owned, and 29 percent in Brazil, where more than 40 percent of major mobile devices are employeeowned.
- Despite the relatively low penetration of BYOD in European countries, Europe will see less growth than Asia and Latin America.



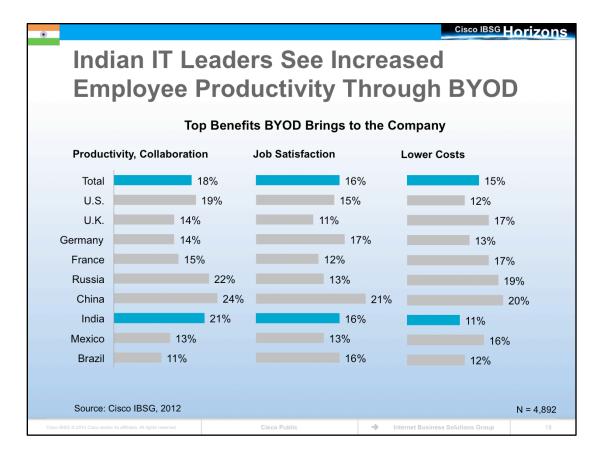
- Eighty-four percent of the IT leaders in this study say they are seeing BYOD growth in their companies.
- Although this poses challenges for these IT leaders, 69 percent say they consider BYOD to be somewhat to very beneficial for their IT departments.



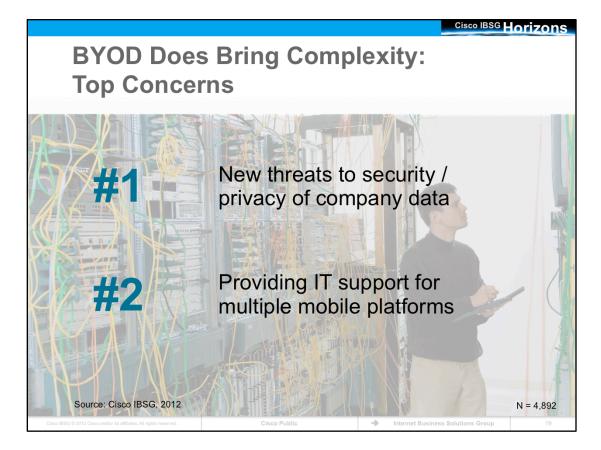
- 94 percent of Indian IT leaders acknowledge that work devices are becoming "consumerized," meaning that employees expect to use the same devices in their personal lives and at work. This is another term for BYOD.
- 78 percent of them are positive about the BYOD trend. Interestingly, 40 percent of enterprises are "extremely" positive, compared to only 25 percent of midsize companies.
- Even in Europe, where the BYOD trend is less prevalent, 72 percent are seeing growth.
- It is in the sentiments of IT leaders that we see the greatest gulf. In Europe, particularly the United Kingdom, Germany, and France, IT leaders are far less positive about the impact of BYOD than in the rest of the countries we surveyed.



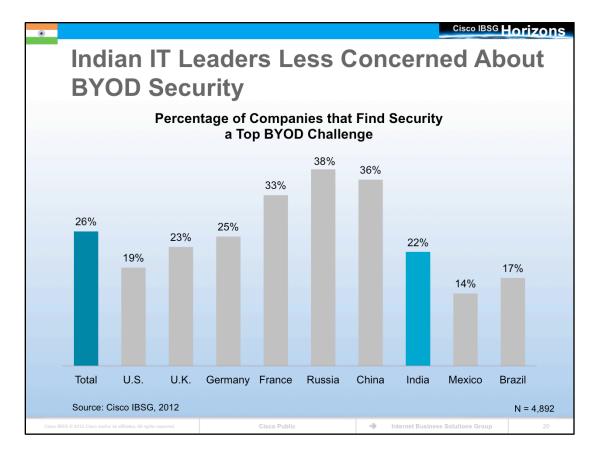
- The top benefits of BYOD for companies are:
 - Productivity: Employees become more productive, and they can collaborate with each other and those outside the company more easily.
 - Job satisfaction: Employees want to use the same devices for work that they use in their personal lives. When employees can choose their own devices, they are happier and more satisfied in their work.
 - -Lower costs when employees pay for their devices.



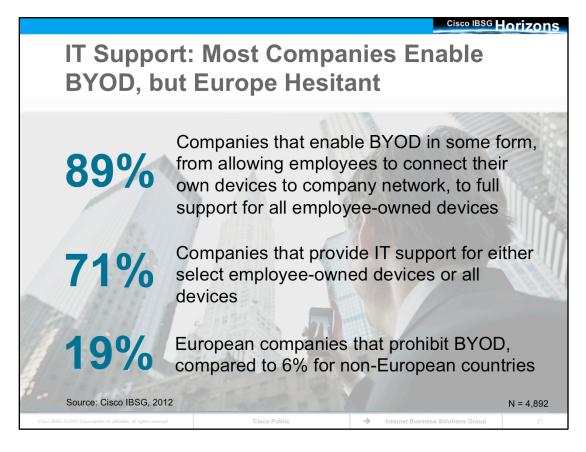
- Indian IT leaders clearly see the top benefit of BYOD in terms of productivity and collaboration (21 percent). This is also the top average benefit among all IT leaders. This is noteworthy, since one of the top arguments against BYOD is lost productivity, due to employees using their devices for personal purposes and entertainment.
- Among Indian IT leaders, the next two benefits are job satisfaction (16 percent), and lower costs (11 percent).
- While not shown, improved data security (11 percent) was tied with lower costs. It is especially interesting that data security was seen as one of the top three benefits in India (and the United States), which also have the highest workforce mobility and some of the highest shares of consumer devices in the workplace. And as we shall see, security issues topped the list of concerns with BYOD among all IT leaders.



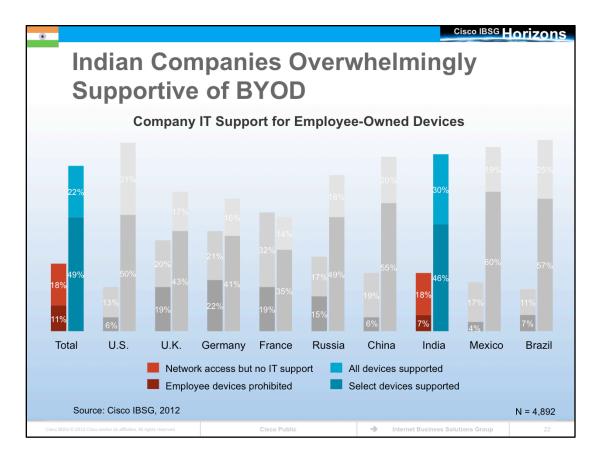
- The international results are consistent with what we found in the United States regarding the main drawbacks of BYOD. The top concerns according to the IT leaders in this study are:
 - Security—How do companies ensure their data, and the data of their customers, is secure?
 - Support—How do IT departments support multiple devices, platforms, and applications?
- Additionally, IT leaders are concerned about access: Since mobile devices open new paths of intrusion, how do IT departments enforce policies to ensure that only authorized people have access to sensitive information, and how do they maintain regulatory compliance?



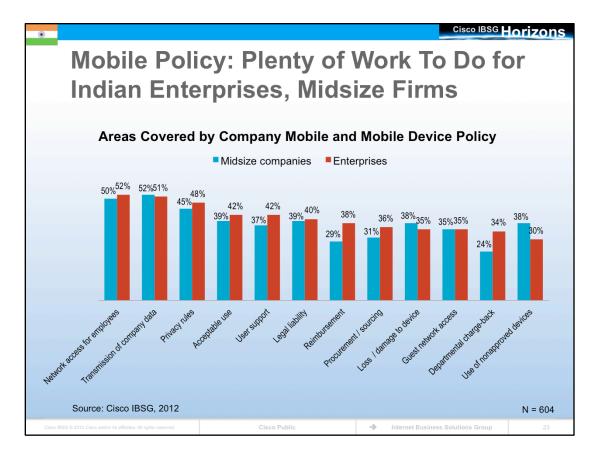
- While security was the top challenge sited by Indian IT leaders, most other countries were far more concerned than India with the vulnerability BYOD could create. Keep in mind that 11 percent of Indian respondents believed that a benefit of BYOD was *improved* security. While in other countries security was clearly the most top-of-mind concern, in India, challenges were more diverse, perhaps also an indication that the Indian experience with mobility is more mature. Top Indian concerns included:
 - Increased complexity of IT support (15 percent)
 - New risks in terms of regulatory compliance (10 percent)
 - Increased policy enforcement complexity (9 percent)
- In Europe, however, the perceived danger of BYOD to corporate network security is likely a major reason that companies have not embraced the trend as fully as others. With the exception of China, European countries are the most concerned with the negative effects of BYOD on the security of corporate networks. Interestingly, the concerns over network security have not made Chinese companies reluctant to embrace BYOD, since they believe the benefits far outweigh the potential costs.



- Overall, there is strong support for enabling BYOD among corporate IT leaders. Nearly 90 percent of companies accept BYOD in some form, ranging from simply allowing employee-owned devices on the corporate network to full IT support for any employee-owned device. This proves once again how universal the BYOD trend has become.
- And 71 percent encourage IT by providing some level of IT support.
- European companies, however, are much less accommodating of employeeowned devices in the workplace.



- Three times the number of Indian companies support BYOD (76 percent) than restrict it (25 percent). Similar levels of approval are also present in the United States and China.
- Brazil has the overall least restrictive policies, with 82 percent of companies supporting either select or all employee-owned devices.
- The countries in which IT leaders were least positive about the impact of BYOD – France, Germany, and the United Kingdom – have the most restrictive policies. In France, for example, a higher percentage of companies either prohibit employee-owned devices in the workplace or offer only network access, with no other forms of support.



- Overall, midsize and enterprise companies in India are not very different in implementation of mobile policy, but levels are fairly low overall. Barely half of Indian companies surveyed have policies around network access or transmission of company data – and those are the areas in which policies are most critical for ensuring the security of corporate networks.
- In general, a lack of clarity around mobility policy can reduce the benefits of BYOD, while making the drawbacks more prevalent.

Cisco IBSG Horizons

N = 4.892

Employees Want Freedom To Reinvent Their Work Style Through BYOD...

Employees want an any-device, anywhere work style (37%)

Employees want to do personal activities during work and work activities during personal time (35%)

Avoid usage restrictions of companyowned devices (31%)

- Employees are turning to BYOD because they want more control of their work experience, thus improving productivity and job satisfaction.
- Their first desire is device choice. They want to work on the device with which they are most comfortable, and they want to work wherever they need to be.
- Their second desire is to choose when they do what. They want the flexibility to undertake personal activities while at work and to do their work during nontraditional work periods such as nights and weekends.
- Finally, they want freedom to use the device the way they see fit, including which apps to download.

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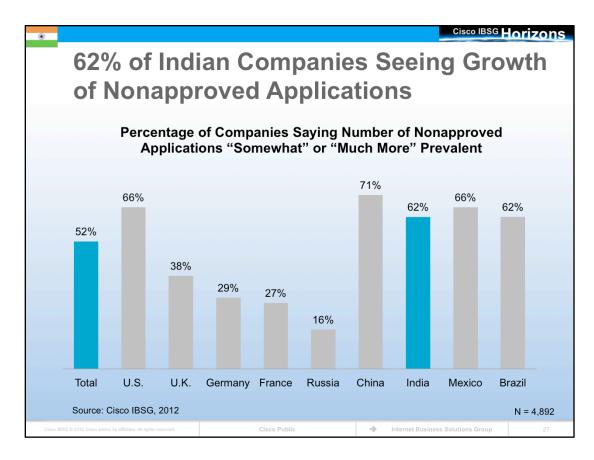
Source: Cisco IBSG, 2012



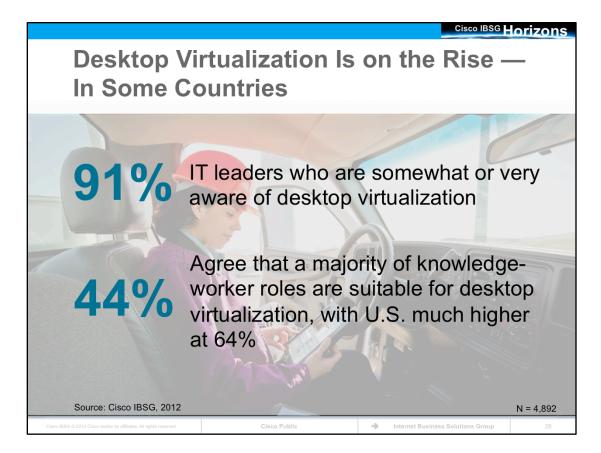
- By giving employees freedom to choose the devices, applications, and cloud services they use, work processes can be redefined. Employee-led innovation extends far beyond when and where to work.
- Through BYOD, employees can continually innovate in a multitude of ways, such as using cloud-based services to analyze and visualize data on a mobile device, discovering the perfect tool for managing complex workflows, or recording video meetings to improve execution when decisions are made.
- The potential for consistent bottom-up innovation is tremendous, and the tools are readily at hand: increasingly inexpensive, powerful devices; thousands of mobile applications with enterprise-level power and sophistication that cost only a few dollars; and application-development tools that nonexperts can use to quickly design their own custom applications.



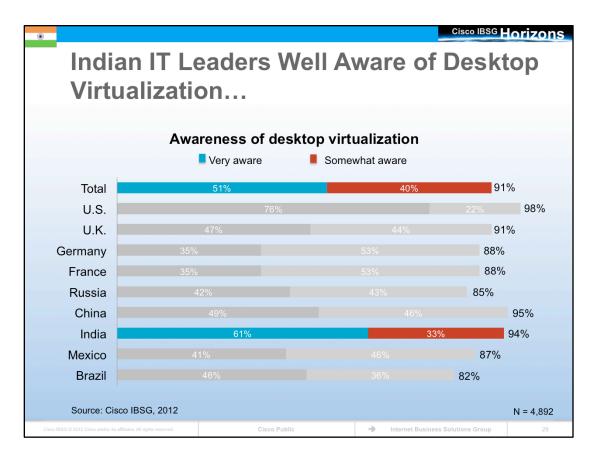
- Along with the growth of employee-owned devices, 52 percent of IT leaders say that nonapproved software applications and cloud services are "somewhat" or "much more" prevalent today than two years ago. It makes sense that nonapproved applications would increase, since employees do not simply want to use the device of their choice, but also the software and cloud services they prefer.
- European countries are seeing far less growth, perhaps because of policy restrictions that discourage them.



- Over 60 percent of Indian companies are seeing increases in the percentage of nonapproved applications on corporate networks. In addition to social networking (50 percent) and browsers (39 percent), Indian employees are using their favorite applications to collaborate (instant messaging, 37 percent) and improve their productivity (desktop productivity, 36 percent).
- As we can see, there is a stark difference in the prevalence of nonapproved applications between European countries and all other countries in our study. In Russia, for example, only 16 percent of IT leaders say they have seen a growing number of nonapproved applications, versus 71 percent in China.
- We may be seeing both *virtuous* circles (positive impressions of BYOD, resulting in more favorable policies, thereby producing enhanced benefits and increasing enthusiasm) and *vicious* circles (suspicion of BYOD, resulting in restrictive policies and muted impact, reinforcing the initial skepticism) at play.



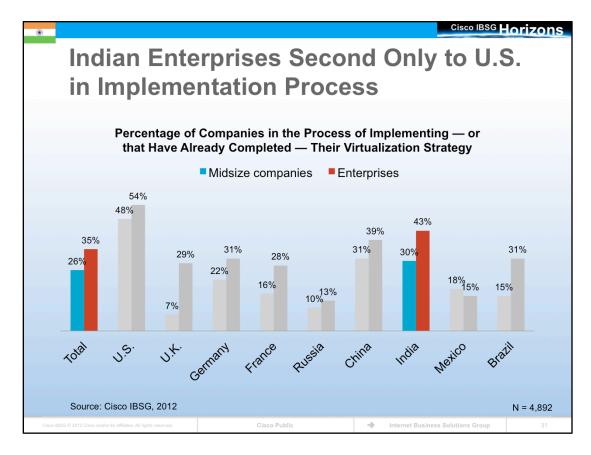
- This study also explored desktop virtualization, which is becoming increasingly popular—and which could potentially fit nicely with the BYOD trend.
- Desktop virtualization separates the desktop environment from the device and enables employees to get the same or similar experience regardless of where they are or which device they are using.
- This study found that desktop virtualization is very much on the minds of IT leaders. Of the IT leaders polled in this study, 91 percent are very or somewhat familiar with desktop virtualization.
- However, outside the United States, where 64 percent of IT leaders believe a majority of knowledge workers could benefit from desktop virtualization, companies feel virtualization has limited applicability for knowledge workers.
- Desktop virtualization is also sometimes called:
 - Virtual desktop infrastructure (VDI)
 - Hosted virtual desktop (HVD)
 - Desktop as a service (DaaS)
 - Server-based computing



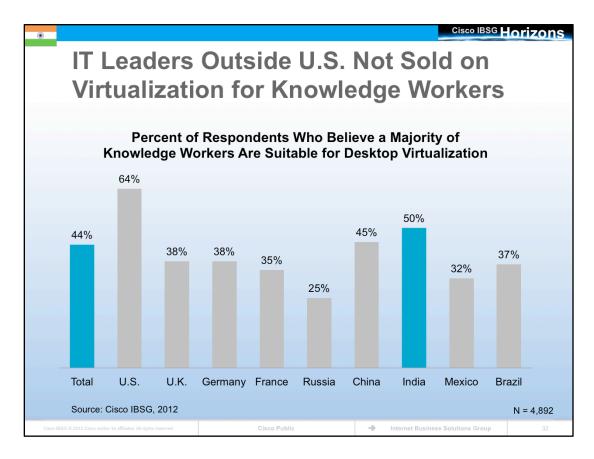
• For IT leaders in the United States and India, desktop virtualization is a wellknown concept. Elsewhere, less than 50 percent are "very aware," although nearly all have some familiarity.

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	7						
Total	5%	28%		39%		27%	
U.S.	4%		47%			15	5%
U.K.	4%	22%				30%	
Germany	6%	23%				36%	
France	5%	20%				32%	
Russia	1% 11%				48%	6	
China	1%	35%				27%	
India	13%		27%		39%	21%	
Mexico	2% 14%					25%	
Brazil	2% 1					19%	
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Source: Cisco IBSG, 2012							N = 4,892
Cisco IBSG © 2012 Cisco and	d/or its affiliates. All rights		Cisc	co Public	Internet Busine	ss Solutions Group	

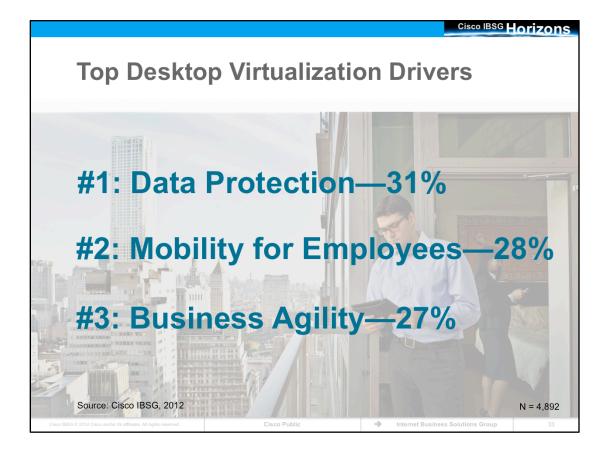
- 13 percent of Indian companies interviewed have completed their desktop virtualization program, which is twice the rate of all other geographies interviewed, including the United States (4 percent) and other BRIC countries (2 percent).
- That said, many more companies in India are still in the process of implementation or funding their desktop virtualization plans, and almost the same percentage of Indian companies have no desktop virtualization strategy (21 percent) as the global average (27 percent).
- For several other countries, though, such as Russia and Mexico, desktop virtualization is a lesser priority.



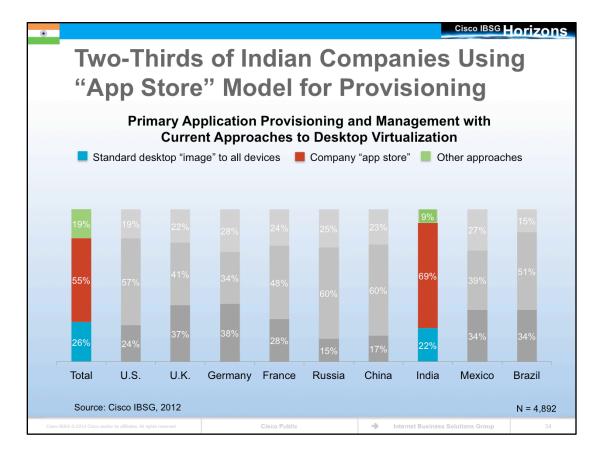
- 43 percent of enterprises in India have completed, or are in the process of completing, their desktop virtualization, second only to American enterprises (54 percent).
- Only 30 percent of Indian midsize firms, by comparison, have achieved the same level of implementation putting them behind their counterparts in the United States (48 percent) and China (31 percent).



- 50 percent of Indian IT leaders feel desktop virtualization is applicable to at least half of their workforce, compared to 64 percent in the United States, 45 percent in China, and below 40 percent for all other countries surveyed.
- Perhaps IT leaders in these countries are "behind" in implementing desktop virtualization because they believe it to be less applicable to knowledge workers than do their counterparts in the United States.

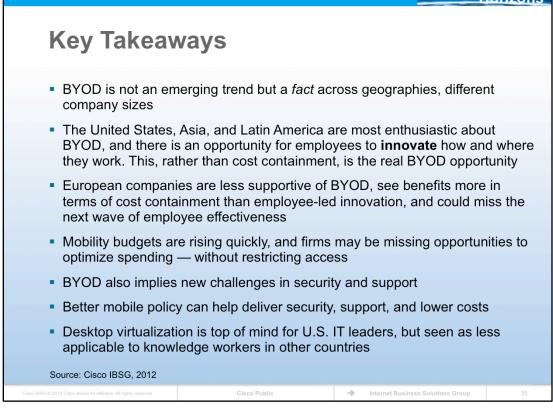


- Most IT leaders recognize that employees in their organization could benefit from desktop virtualization (44 percent believe half or more of their employees could benefit), but desktop virtualization poses challenges. The top three concerns are:
 - -Data protection: How does the enterprise ensure only the right people have access to sensitive company and customer data?
 - -**Mobility for employees:** Enabling employees to work from wherever they are, rather than being constrained to a desk or campus, including telework.
 - -Business agility: The speed with which companies can roll out software updates and platforms.



- IT leaders are accustomed to pushing approved devices and applications on to employees—when a new employee starts, he or she has a laptop and a standard set of office applications set up and ready to use. But with employees bringing their own devices, IT departments are changing the way they provision and manage devices.
- IT leaders who accept this sea change are embracing it by supporting nonstandard applications and distributing them through a corporate app store. India is in the lead in this regard, with 69 percent of companies using an app store model.
- The following describe how IT leaders in India are provisioning and managing applications today:
 - Employees download approved and nonstandard applications from a company app store—69 percent
 - The IT department pushes images for approved applications to all employees' desktops—22 percent
 - Other approaches, including provisioning based on job role-9 percent





- As we have seen, BYOD is happening in companies across the world, at both midsize companies and enterprises. It is not an emerging trend, but a fact.
- There are varying degrees of support and enthusiasm, however. The United States, Asia, and Latin America are bullish on the prospects of BYOD, and are willing to give employees more control.
- By giving them control, companies can allow employee-led innovation to unfold, as knowledge workers find better ways of performing their typical tasks, and even expand into higher-value work. For example, the ability to download powerful data analytics applications that formerly were provided only to specialists can now help any employee add value in new ways.
- Companies must guard against rising mobility costs.
- They must also face new challenges in how they secure their networks and support mobile devices in a BYOD environment.
- For many companies, better, more comprehensive mobile policies could help deliver BYOD with greater security at a lower cost.
- Desktop virtualization could also help. But IT leaders outside the United States see desktop virtualization as less applicable to knowledge workers, and are not implementing it as extensively.

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