Point of View

A "Marriage Made in Heaven": Mobile Devices Meet the Mobile Cloud

Cisco IBSG Research Uncovers Opportunities for SPs To Prosper in Mobile Cloud Market

Authors
Stuart Taylor
Andy Young
Neeraj Kumar
James Macaulay

October 2011

Cisco Internet Business Solutions Group (IBSG)

A "Marriage Made in Heaven": Mobile Devices Meet the Mobile Cloud

Cisco IBSG Research Uncovers New Opportunities for SPs To Prosper in Mobile Cloud Market

The huge popularity and rapid growth of smartphones over the past couple of years has been truly breathtaking. In fact, industry analysts have had to constantly revise their forecasts to keep up with the exploding market for these small, mobile computers. In 2008, IDC's forecast for smartphone sales in 2010 underestimated the actual growth by half. The analyst firm is now forecasting that the number of smartphones will overtake PC shipments by 2012.[1] If history is anything to go by, we will reach this point much quicker than current projections.

While these devices provide basic voice calling, it is the additional capabilities such as email, Internet access, and sophisticated computing capabilities that set smartphones apart, driving demand among consumers and business users alike. Devices like the Apple iPhone, RIM BlackBerry, and Android smartphones also bring a host of applications and services to the palm of one's hand.

At the same time, cloud computing has become *the* new way of delivering—and charging for—IT services and functionality. Technology services and applications are increasingly being delivered and paid for on-demand from remote data centers, accessible through the "cloud" of interconnected networks that constitute the Internet. Everything from email, content storage, and applications like Salesforce.com to more complex computing and development platforms can now be accessed through simple browsers and delivered through the cloud, eliminating the need for end-user applications and high-powered computers.

The collision of these trends—the *mobile cloud*—stands to significantly increase the overall value of mobility, as well as radically alter the way people live, learn, work, and play.

While there is a lot of talk about the mobile cloud, definitions vary widely, if they exist at all. The Cisco® Internet Business Solutions Group (IBSG) defines the mobile cloud as *mobile services and applications delivered from a centralized (and perhaps virtualized) data center to a mobile device such as a smartphone.* Customers access these services on-demand using the browser or thin client on their mobile device. This contrasts to "thicker clients" that are downloaded from app stores and reside (and run) on the mobile device. Mobile cloud services are agnostic to the type of device or operating system on which they run.

Mobile cloud comprises two categories of services:

- **Traditional cloud services:** the extension of traditional, wired cloud services (Saas, Iaas) to mobile devices (e.g., Mozy, Salesforce.com)

- **Unique mobile cloud services:** services that exploit features of the mobile device (e.g., camera, voice recognition) and the characteristics of mobility (e.g., location, presence) to create unique, cloud-delivered offerings (e.g., bar-code scanning, real-time translation).

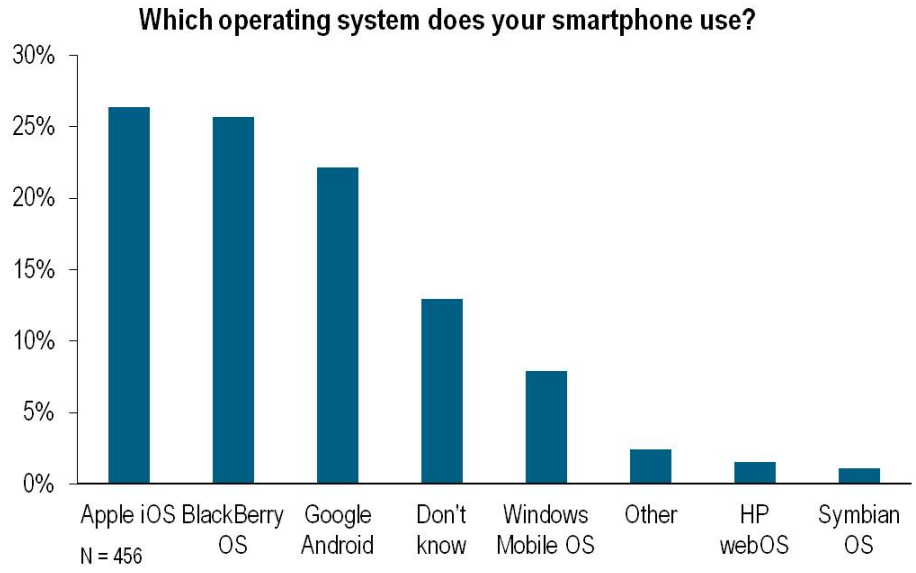
Cisco IBSG believes it is critically important to fully comprehend the relationships between mobile device types and customers' needs and buying behaviors, and how this translates into demand for mobile cloud.

Cisco IBSG recently conducted a *Mobile Cloud Watch* survey of 1,016 U.S. mobile users to understand their current and future needs, and to learn how they prefer to pay for mobile cloud services.[2] The research findings are important because they allow service providers (SPs) to understand the size of the opportunity, develop strategies for success, and differentiate their offerings to become more competitive.[3]

The Device Divide

Almost half (45 percent) of survey respondents already have smartphones. Most remarkable, the survey revealed that up to 60 percent of U.S. mobile phone subscribers could be smartphone users by the end of 2013. Apple, RIM, and Android devices are definitely the "big three" smartphone brands (see Figure 1). Of particular note is that almost 15 percent of respondents were unaware of their smartphones' operating systems, suggesting they based their purchases on a certain device type rather than a broader mobile ecosystem.

Figure 1. Smartphone Operating Systems (Smartphone Users).



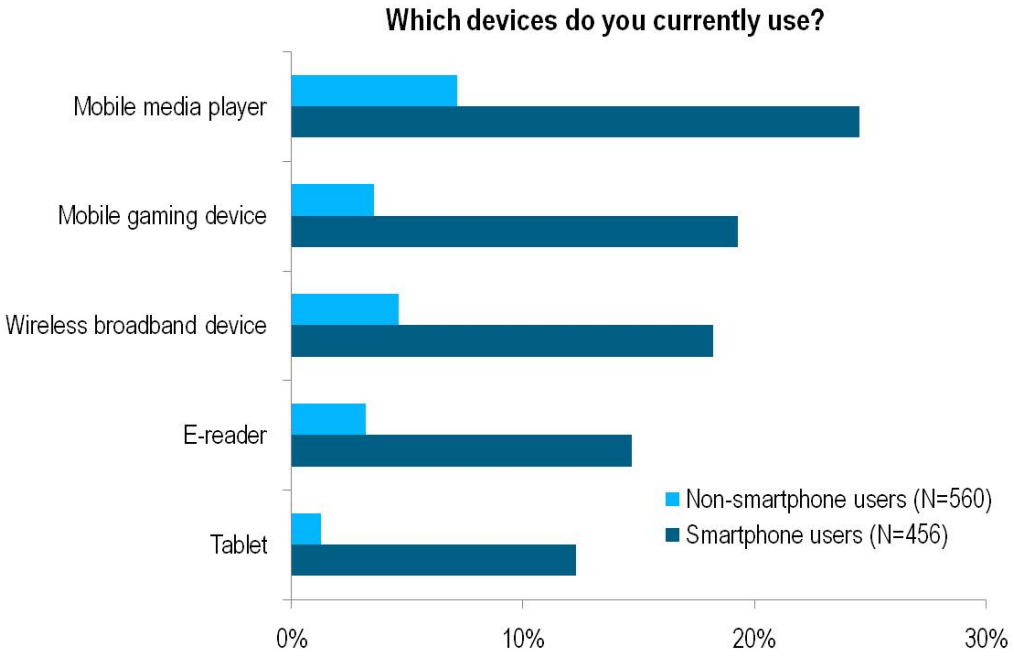
Source: Cisco IBSG, 2011

There is a distinct and widening gap between the characteristics of smartphone users and those of non-smartphone users. On average, smartphone users are much younger (37 years of age), compared with an average age of 50 for non-smartphone users. In fact, the age distributions completely mirror each other, with almost 50 percent of smartphone users being under 35 years of age and 50 percent of non-smartphone users being older than 50.

A similar divide exists in income levels and employment status. Smartphone users have much higher annual incomes, averaging $96,000 compared to $70,000 for non-smartphone users. Smartphone users are much more likely to be fully employed or self-employed versus non-smartphone users, who have a greater likelihood of being retired or unemployed. Smartphone users are also much more valuable to mobile operators due to their considerably higher spending on voice and data services. On average, smartphone users spend $100 per month compared to $61 monthly from non-smartphone users.

Smartphone users are technologically savvy. Almost half of them reported they are early adopters of the latest consumer technology products. Non-smartphone users tend to be technology laggards—waiting to purchase new technology until it is well proven, if at all. This technology savviness is clearly demonstrated in the large disparity in the number of devices the two groups own (see Figure 2). Smartphone users are not only big adopters of additional devices, including recent introductions such as tablets—they also see the value in single-purpose devices for activities such as gaming, media consumption, and e-reading.

Figure 2. Additional Devices Used by Mobile Phone Subscribers.



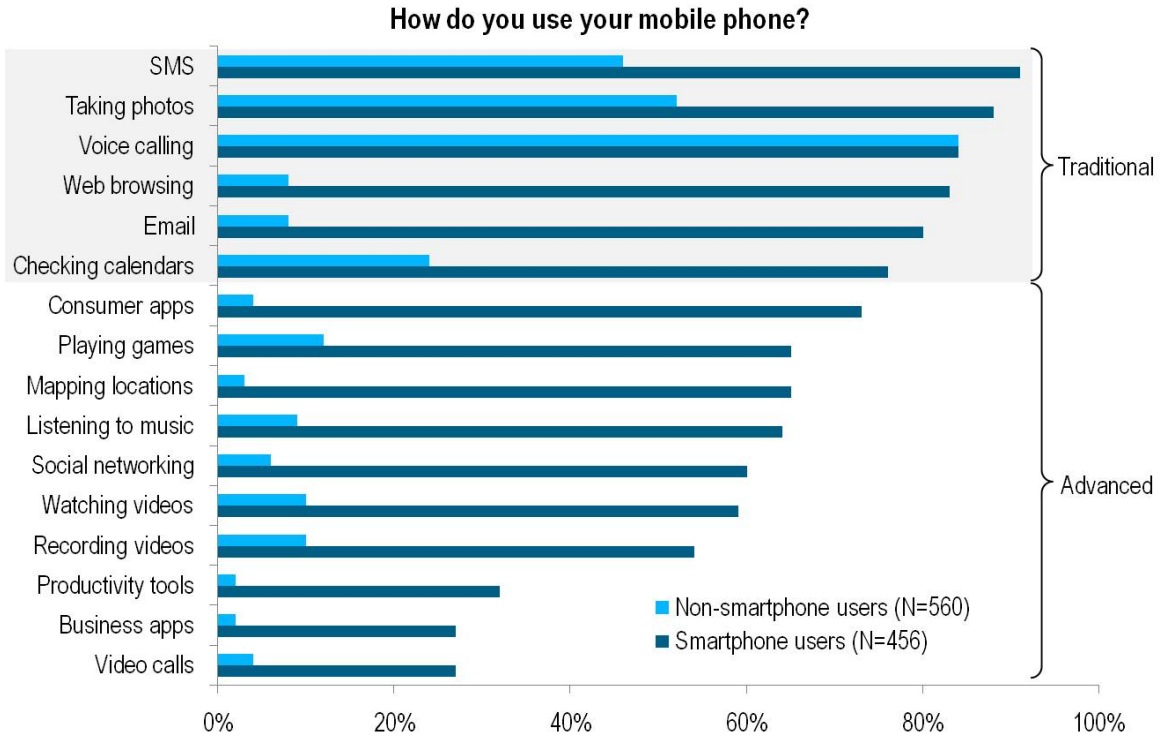
Source: Cisco IBSG, 2011

Smarter Phones or More-Mobile Computers?

Smartphone owners are selecting their devices primarily to acquire the best functionality. Fifty percent of smartphone respondents indicated that device functionality is their key buying criteria, followed by brand and ease of use. Looks, "hotness," and media reviews were much less important factors in choosing a specific smartphone. Conversely, price of data plans and of the device itself were the greatest deterrents to owning a smartphone, followed by lack of perceived need.

Smartphone users are huge consumers of more traditional mobile phone features such as SMS, taking pictures, web access, and email (see Figure 3). Voice calling is just another capability or application on the device for these mobile users. This may explain why 20 percent of smartphone users had two or more devices, while non-smartphone users predominantly had a single mobile device (93 percent). Smartphone users are primarily interested in the computer-like capabilities of the device and are willing to carry another device to compensate for the sometimes-poor voice capabilities of smartphones.

Figure 3. Current Use of Mobile Phone Features.

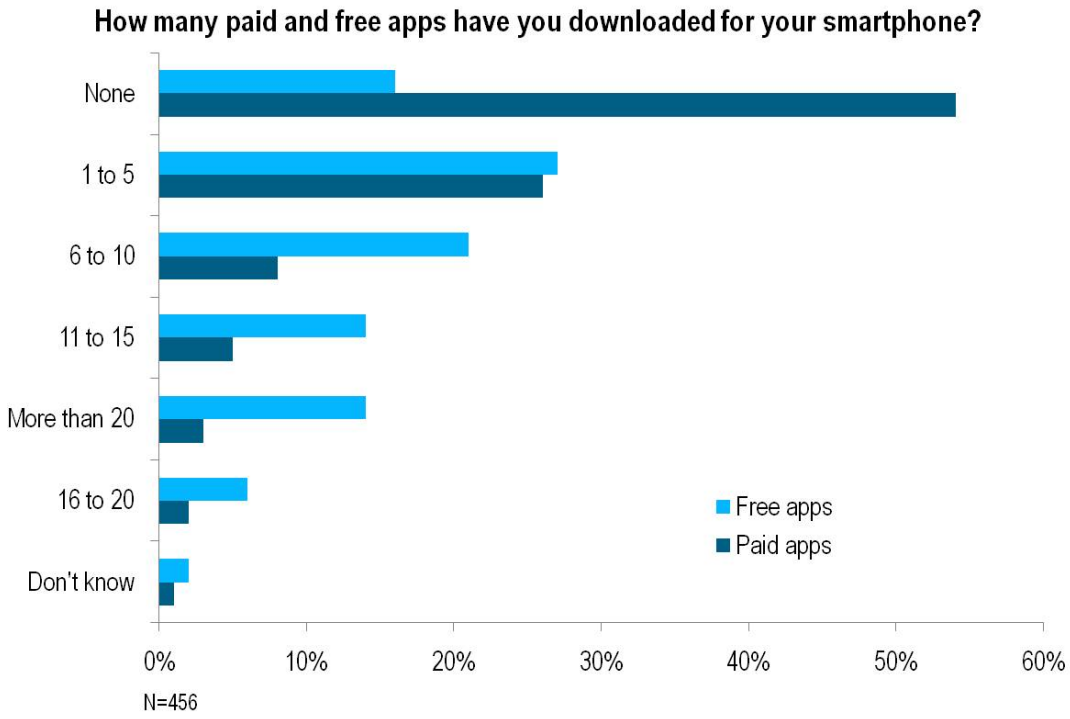


Source: Cisco IBSG, 2011

More than three-quarters of respondents currently use the six traditional features shown at the top part of Figure 3. These are the core capabilities of today's smartphones. However, smartphone users are quickly adopting more-advanced features increasingly included in many smartphones. Almost 60 percent of customers are using their smartphones to visit social networking sites, and to watch and record videos. Remarkably, one-quarter of respondents reported using their devices for the relatively new mobile capability of two-way video calling.

Three-quarters of smartphone users reported running applications on their devices. However, as shown in Figure 4, few users are paying for these apps. While users may pay for some apps, heavy app users largely prefer free apps. Increasingly, more of these apps and smartphone features use Wi-Fi rather than traditional mobile networks to access the Internet. On average, smartphone users reported spending a stunning 35 percent of their time browsing the web through a Wi-Fi connection rather than over the cellular network.

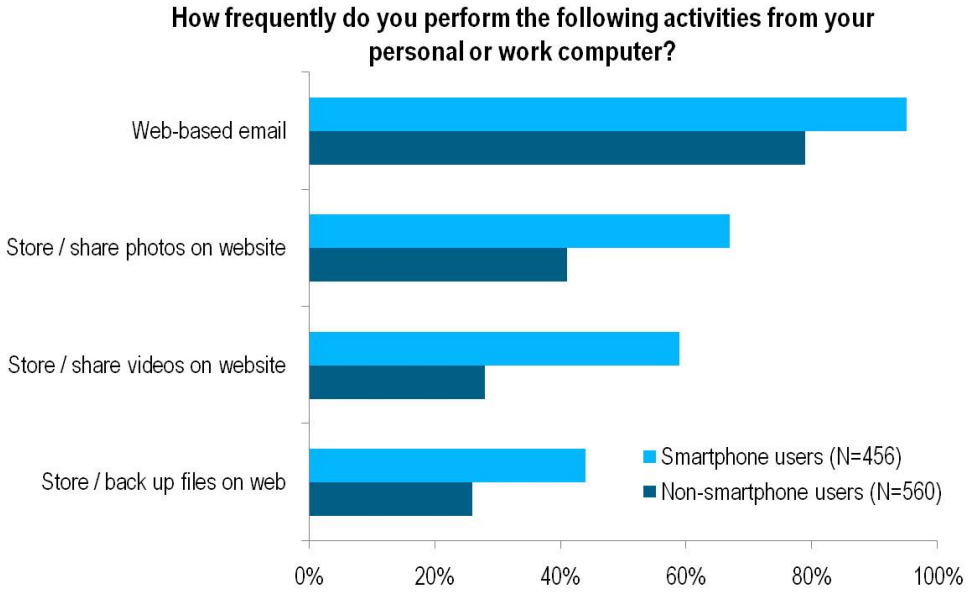
Figure 4. Paid Versus Free Apps Downloaded (Smartphone Users).



Source: Cisco IBSG, 2011

Another remarkable thing about smartphone users is that they are much more comfortable with using cloud services than non-smartphone users. Given smartphone users' demographic profile and technological sophistication, it is probably no surprise they are already big consumers of cloud-based services in the traditional PC world. As seen in Figure 5, almost all smartphone users are accessing some form of traditional PC-cloud service, with the majority of them (59 percent) comfortably storing and sharing content through cloud services. Smartphone users' familiarity with other cloud services will most likely translate into early adoption of the mobile cloud by this segment.

Figure 5. Current Use of Cloud-based Services on PCs.

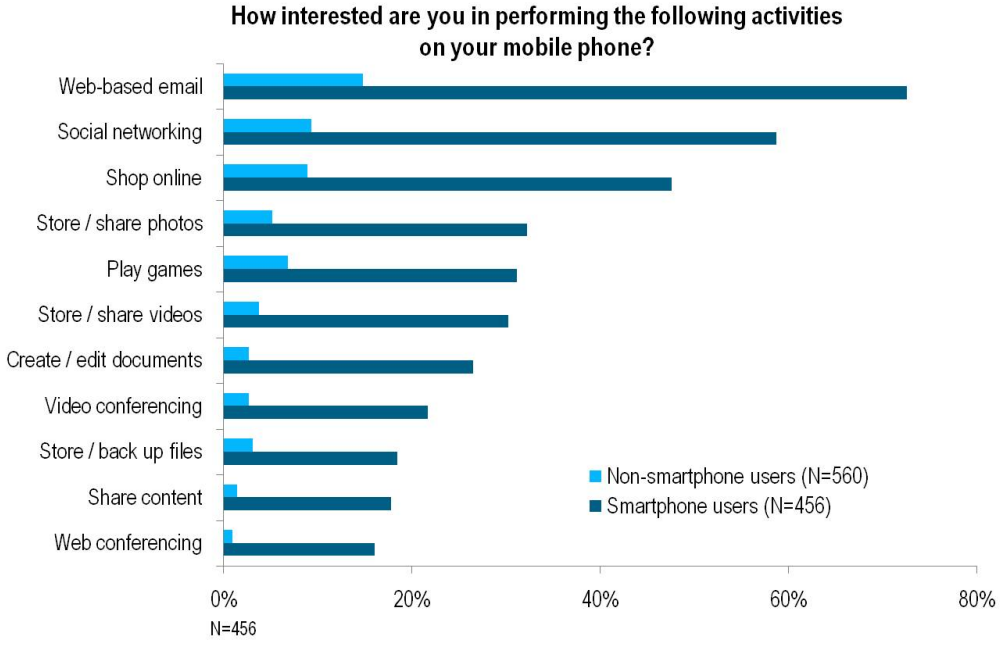


Source: Cisco IBSG, 2011

Heads in the Clouds

Well over half of all smartphone users expect to access web-based email, update social networks, and shop on their mobile devices within the next two years (see Figure 6). And, a good proportion expect to perform PC-like activities on their smartphones, such as storing and sharing content, editing documents, and participating in web conferences. Non-smartphone users appear to have little or no interest in these mobile cloud activities.

Figure 6. Future Mobile Phone Activities (Current and Next Two Years).

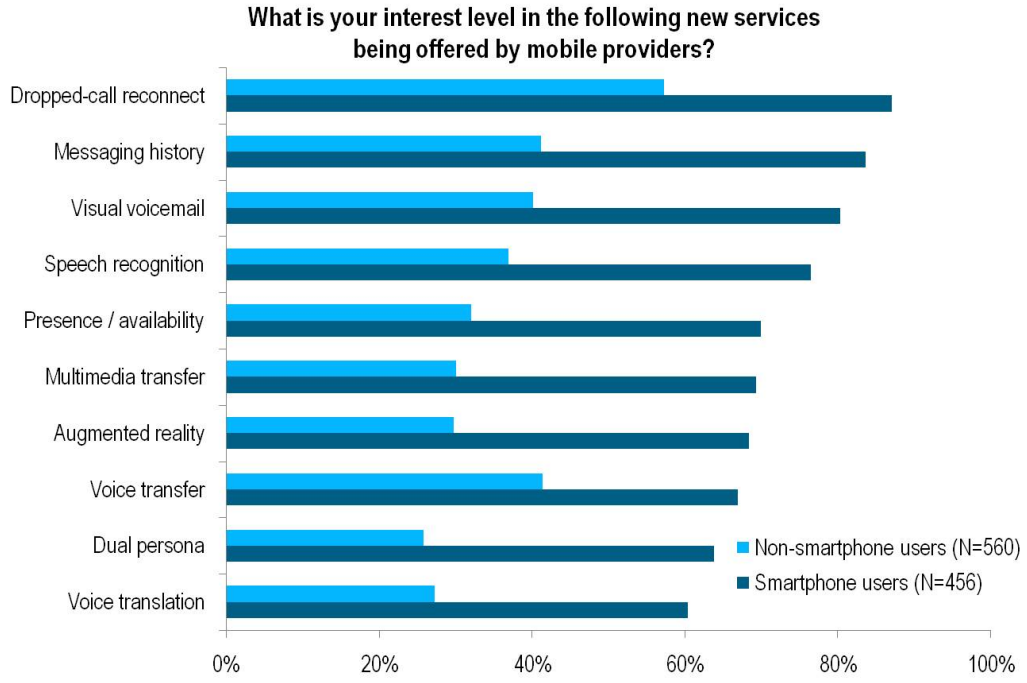


Source: Cisco IBSG, 2011

A new wave of next-generation mobile services (shown in Figure 7) is beginning to enter the market. Smartphone users see the value of these cloud-based services and are very interested in adopting them in the near future. In contrast, a lack of technological vision or comfort level prevents non-smartphone users from seeing the need for these services.

Smartphone users are particularly excited about the opportunity to move unique mobile-specific features and capabilities to the cloud. They especially want to combine the microphone and speaker capabilities of their devices for speech recognition (75 percent over the next one to two years). They also like the idea of combining this capability with mobility to do real-time voice translation (60 percent). Sixty-five percent of smartphone users expressed great interest in having an easy-to-use dual-persona capability that would allow them to represent the different aspects of their lives (perhaps "business" and "consumer," or "student" and "entrepreneur") on a single device through, for example, multiple phone numbers, email accounts, and voicemail boxes. Equally, smartphone users wanted the ability to transfer multimedia content across multiple devices (70 percent). All of these next-generation services would be delivered through the mobile cloud.

Figure 7. Future Use of Next-Generation Mobile Services (Current and Next 2 Years).



Source: Cisco IBSG, 2011

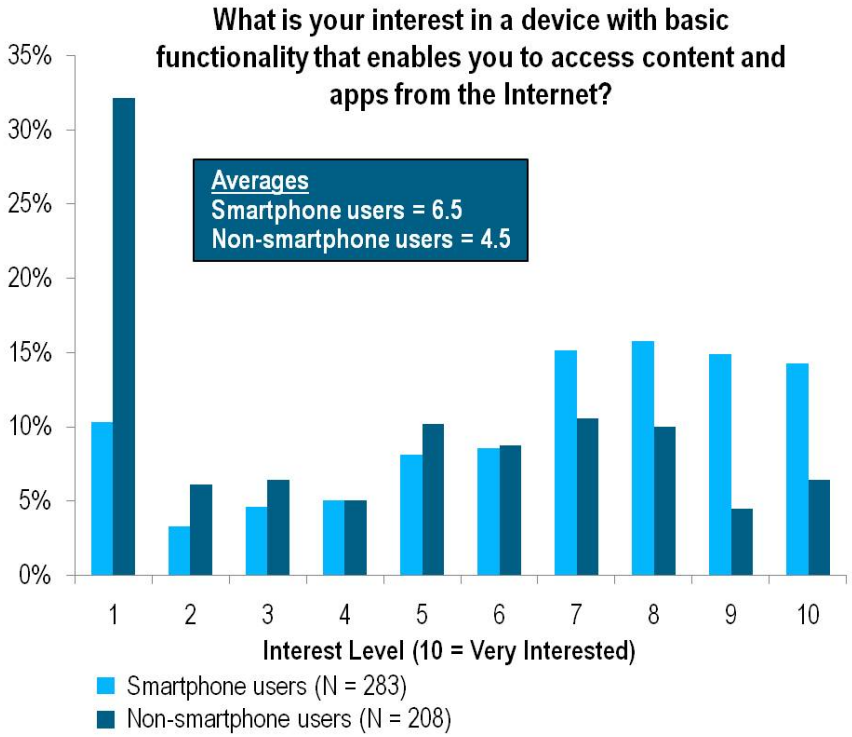
In addition to exploring the perceptions and intentions of various customer segments toward adoption of mobile cloud services, Cisco IBSG tested consumers' interest in several potential mobile cloud offerings. There was a high level of interest in a service that would allow users to use their mobile devices to access personal content such as video, photos, and music stored on a home computer or elsewhere. Smartphone users expressed an average interest level of 6.9 (on a 10-point scale) versus 4.5 for non-smartphone users.

This interest in storing and managing content across multiple devices is consistent with smartphone users' intent to extend PC-based solutions to the mobile cloud by adopting individual content-related solutions, as shown in Figure 6. Equally, there was a big divergence in interest in a service that would allow users to seamlessly move from one device to another while using an app, playing a game, or listening to music, among other activities. Smartphone users indicated an average interest level of 6.7, while non-smartphone users were less interested (4.0 on average).

Smartphone users are also interested in a thin-client device that would allow them to access all of their content and smartphone functionality from the cloud (see Figure 8). Although the average level of interest in this potential offering was 6.5, close to half of all smartphone respondents were very interested (7 and above). Interested users were most attracted to this service because they felt it was more secure, the technology would stay current, and there would be no inherent limits on storage and functionality, as with traditional smartphones.

Paradoxically, it seems smartphone owners are most interested in a service that would effectively replace or minimize the capabilities of their devices, whereas non-smartphone owners are less interested in a cheaper smartphone alternative. Cisco IBSG hypothesizes that mobile users must first experience a smartphone and its capabilities before they can actually appreciate the opportunities a thin-client service would offer.

Figure 8. Interest in a Thin-Cloud Device.

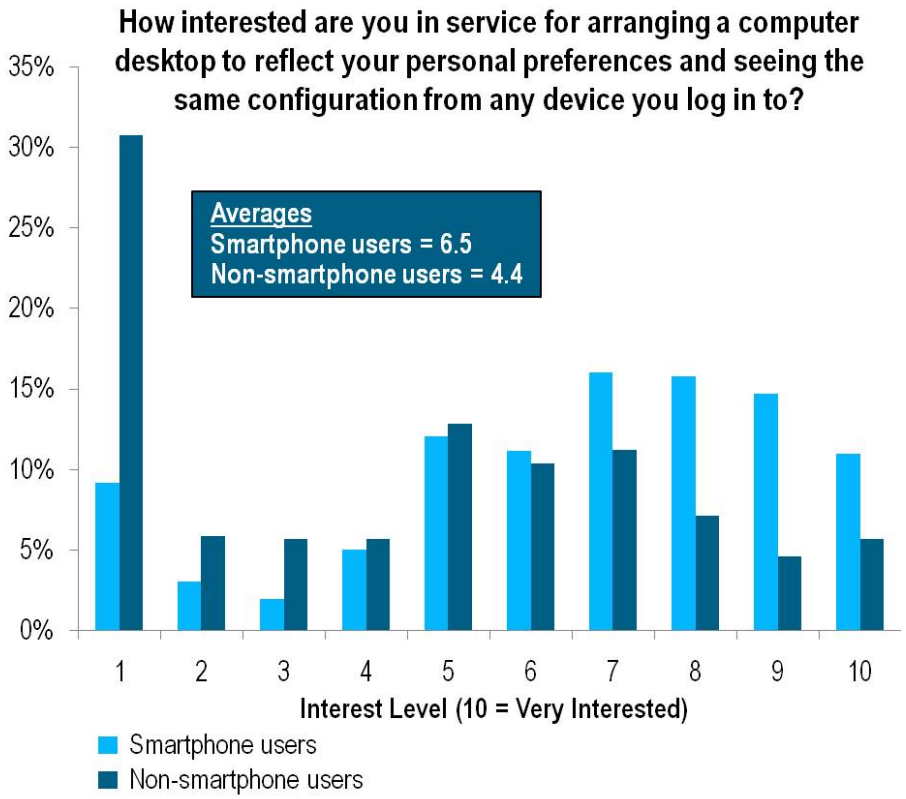


Source: Cisco IBSG, 2011

Similarly, smartphone users were interested in a mobile-cloud-based virtual desktop infrastructure (VDI) service that would allow them to arrange a computer desktop to reflect their personal preferences and view the same configuration on any mobile (or other) device (see Figure 9). More than half of all smartphone users rated this service as a 7 (out of 10) or higher. These highly interested users recognized this service's potential to make them more productive (50 percent of smartphone respondents) and appreciated the consistent look and feel across devices (40 percent of smartphone respondents). Again, non-smartphone users expressed limited interest in a VDI-type mobile cloud service.

Smartphone users are most attracted to the mobile cloud because it can supplement and augment their devices by offering better security, convenience, and an expanded range of functionality compared to device-centric services. Security is top of mind because users recognize the growing importance of their mobile devices and understand how difficult life would be if their devices were lost, stolen, or damaged. Smartphone users also recognize the key value proposition of the mobile cloud—storing all of their critical information, media content, and apps in the cloud, where they can be readily accessed no matter what happens to their mobile device.

Figure 9. Interest in a Cloud-Based Virtual Desktop.



Source: Cisco IBSG, 2011

Compared to traditional wireline services, the mobile cloud presents a different set of challenges in appealing to mobile users as a delivery model. Smartphone users' biggest concern about using the mobile cloud relates to the robustness of the mobile network. If users are going to migrate their content, services, and experiences to the cloud, they need to know that they will always have mobile coverage and reliable connectivity. We would expect these fears to abate and for demand to explode for mobile cloud services as networks migrate to 4G and we enjoy faster, broader, and more reliable mobile services.

A Virtuous Circle

Cisco IBSG's *Mobile Cloud Watch* research clearly demonstrates mobile users are "hungry" for services delivered to their devices (especially smartphones) via the cloud. In fact, smartphone usage and the adoption of mobile cloud services are intimately linked, forming a virtuous circle characterized by:

- **Platform.** Larger screens, alphanumeric keys, and other features of smartphones provide the platform and capabilities required for users to access and fully benefit from cloud services.
- **User profile.** The technical savviness and higher incomes of today's smartphone users open the door for greater interest in advanced mobile services. Not only does this demographic represent early adopters of these services today—smartphone users will be the key drivers and consumers of mobile cloud services in the next two to three years.
- **Vision and familiarity.** Many smartphone users are already comfortable using both PC-based and mobile cloud services. Equally, these users can see how mobile cloud services drastically expand their mobile capabilities and provide needed security for peace of mind in their increasingly mobile-centric lives.
- **Accessibility.** Offloading smartphone capabilities to the cloud will not only reduce device prices and make them more secure—it will enable a better customer experience. Overcoming these key inhibitors to smartphone adoption will encourage more users to purchase smartphones and begin to explore the mobile cloud.

Cisco IBSG believes that growth of the smartphone market is essential to the mobile cloud's success. The relationship between smartphones and the mobile cloud is analogous to the challenge TiVo faced in marketing digital video recorders (DVRs). Customers will not see value in the mobile cloud until they have experienced what a smartphone can offer and understand how they can improve and enhance this experience with cloud-based services. The mobile cloud is a complement to smartphones, not a threat. Increased usage of smartphones boosts demand for the mobile cloud, ultimately driving further demand for smartphones. This virtuous circle benefits all participants—device manufacturers, mobile operators, and mobile cloud service providers.

Priming the Smartphone / Mobile Cloud Circle

The future of mobility definitely looks "smart and cloudy." Cisco IBSG's *Mobile Cloud Watch* research projects strong growth for both smartphones and mobile cloud services. The good news for mobile providers is that they are well positioned in every stage of the smartphone / mobile cloud virtuous circle. They have been fundamental in encouraging adoption of smartphone devices on their networks. In fact, the research indicates smartphone users are generally satisfied with their device, network, and service experiences. Close to 50 percent of all mobile users viewed mobile operators as their preferred provider of mobile cloud services,

dwarfing the less than 20 percent of respondents who preferred web companies. In addition, operators have a strong brand and relationship with mobile users that can naturally be converted into becoming premier mobile-cloud service providers.

Mobile operators are potentially the masters of their own destinies. Not only do they have the blessing of customers to provide these new and advanced mobile cloud services—they have significant influence on one the keys to the success of mobile cloud / smartphone uptake. While this is a great position for mobile operators, there are several implications and potential strategies that SPs should consider to make this vision a reality:

- **Develop an integrated mobile-cloud device strategy.** Recognize that devices and mobile cloud services are co-dependent by promoting new, cloud-centric devices as enabling platforms to provide superior customer experiences and drive demand for mobile cloud services.
- **Smartphone penetration is key.** Work with device manufacturers to create less expensive "thin" devices by moving many advanced capabilities and features to the cloud. Create attractive pricing and marketing campaigns to encourage non-smartphone users to upgrade to smartphones.
- **Differentiate with unique cloud-based advanced mobile services.** Exploit unique mobile device features (e.g., cameras, microphones), the network (e.g., location, presence), and the characteristics of mobility itself to develop an innovative portfolio of cloud-delivered services that will complement the smartphone experience.

Smartphone devices and mobile cloud are definitely a "marriage made in heaven." This virtuous relationship is one of the primary drivers of growth and development of the mobile cloud market. Cisco IBSG believes that mobile operators are well positioned to prosper from the huge opportunity presented by the mobile cloud. To succeed, SPs must develop and market new cloud services and clearly understand the intimate relationship between smartphone penetration and the growth of the mobile cloud.

For more information about mobile cloud opportunities for SPs, please contact:

Stuart Taylor
Director, Global Service Provider Practice
Cisco Internet Business Solutions Group
+1 978 936 0022
stuartt@cisco.com

Andrew Young
Director, Global Service Provider Practice
Cisco Internet Business Solutions Group
+1 978 936 9179
andyoung@cisco.com

Neeraj Kumar
Director, Global Service Provider Practice
Cisco Internet Business Solutions Group
+1 978 936 9988
neerkuma@cisco.com

James Macaulay
Director, Research & Economics Practice
Cisco Internet Business Solutions Group
+1 408 894 8922
jmacaula@cisco.com

Endnotes

1. Source: IDC, 2008.
2. Cisco IBSG, with the support of Cisco Marketing and Cisco CTO, launched *Mobile Cloud Watch,* an online survey of 1,016 U.S. mobile users, in February 2010. The survey sought to understand which mobile cloud services these customers use now, which ones they are planning to adopt the future, and from whom they would buy these services. In addition, Cisco IBSG wanted to understand the role and opportunity for mobile operators, and how they might differentiate their mobile cloud offers.

   The survey base was representative of the U.S. population in terms of age, income level, physical distribution, and employment status. In terms of attitudes toward adopting new technology, respondents were well distributed among early adopters (13 percent), early majority (35 percent), mainstreamers (35 percent), and laggards (17 percent). Fifty-six percent of respondents were employed: full-time (40 percent), part-time (8 percent), and self-employed (8 percent). The remaining 44 percent of respondents were not employed: stay at home (9 percent), student (7 percent), unemployed (8 percent), unable to work (4 percent), and retired (16 percent).
3. Based on the research findings, the Cisco IBSG Global Service Provider Practice and the Cisco IBSG Research & Economics Practice created four white papers: *The Mobile Cloud: When Two Explosive Markets Collide*—an overview of the top 10 mobile cloud

findings, implications, and opportunities for SPs from the combined perspectives of business users, consumers, and devices; *Mobile Consumers Reach for the Clouds*—research paper focused on the top findings, implications, and opportunities for SPs from the perspective of consumers; *Taking Care of Business in the Mobile Cloud*—research paper focused on the top findings, implications, and opportunities for SPs from the perspective of business users; *A Marriage Made in Heaven: Mobile Devices Meet the Cloud*—this paper.

More Information

Cisco Internet Business Solutions Group (IBSG), the company's global consultancy, helps CXOs from the world's largest public and private organizations solve critical business challenges. By connecting strategy, process, and technology, Cisco IBSG industry experts enable customers to turn visionary ideas into value.

For further information about IBSG, visit http://www.cisco.com/go/ibsg.

Cisco IBSG Global Service Provider Practice

The Cisco Internet Business Solutions Group (IBSG) Global Service Provider Practice consults with leading service providers (SPs) throughout the world to help them develop and execute winning business strategies. The practice's effectiveness with SP customers is rooted in deep industry expertise, leading strategic and economic skills, and insights and best practices derived from original industry thought leadership. As trusted advisers, the Cisco IBSG Global Service Provider Practice is responsible for helping customers improve profitability by driving new services for top-line growth, improving go-to-market approaches, and creating operational efficiencies through productivity initiatives. For further information, please visit http://www.cisco.com/web/about/ac79/sp/index.html

Cisco IBSG Research & Economics Practice

The Cisco IBSG Research & Economics (R&E) Practice uniquely combines ongoing original research with in-depth financial analysis to produce high-impact insights and thought leadership for the world's largest public and private organizations. With resources on four continents, the R&E Practice each year surveys tens of thousands of consumers and businesses around the world to explore cutting-edge trends and emerging opportunities, and develops more than 100 executive-ready financial models on the business benefits of technology innovation. The team's custom research and financial analysis enable Cisco IBSG's vertical consultants to deliver transformative business solutions across a broad range of industries. For further information about the Cisco IBSG Research & Economics Practice, visit http://www.cisco.com/web/about/ac79/re/index.html

Americas Headquarters
Cisco Systems, Inc.
San Jose, CA

Asia Pacific Headquarters
Cisco Systems (USA) Pte. Ltd.
Singapore

Europe Headquarters
Cisco Systems International BV Amsterdam,
The Netherlands

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco Website at **www.cisco.com/go/offices.**