What Do Consumers Want from Wi-Fi?

Insights from Cisco IBSG Consumer Research

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By Stuart Taylor, Andy Young, and Andy Noronha

The insatiable demand for smartphones, tablets, and other connected devices is generating staggering amounts of mobile data. The Cisco Visual Networking Index (VNI) predicts that global mobile data traffic will increase 18-fold from 2011 to 2016, reaching 10.8 exabytes per month. In parallel, the use of Wi-Fi for Internet access is exploding as more mobile devices are Wi-Fi enabled, the number of public hotspots expands, and user acceptance grows. Until recently, most technologists and mobile industry executives viewed Wi-Fi as the "poor cousin" to licensed mobile communications. And they certainly never viewed any role for Wi-Fi in mobile networks or their business. The explosion of mobile data traffic has changed all of that. Most mobile operators now realize that offloading data traffic to Wi-Fi can, and must, play a significant role in helping them avoid clogged networks and unhappy customers. In addition, service providers (SPs) are struggling to understand new business models for making money from Wi-Fi.

In all of this strategizing about Wi-Fi, there is precious little research about how end users are actually using Wi-Fi, how they want to employ it in the future, and, more specifically, about what drives a user to connect his or her device to the Internet with Wi-Fi rather than "mobile."[1]

To learn more, the Cisco® Internet Business Solutions Group (IBSG) conducted a survey of 1,079 U.S. mobile users to understand their needs and behaviors, current and future mobile usage, and level of interest in Wi-Fi and new forms of monetization. The research findings are important because they allow SPs to understand the size of the opportunity, develop strategies for success, and differentiate their Wi-Fi offerings and initiatives to become more competitive.

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[1] In this paper, we will use the term "mobile" to represent wireless connectivity over licensed spectrum, based on a cellular architecture.

A World of Wi-Fi Devices

Americans love their mobile devices, as evidenced by the significant percentages of respondents who reported using everything from laptops and smartphones to tablets, eReaders, and mobile gaming devices. For example, 75 percent of respondents said they have a laptop computer. Perhaps more significant, our findings show that the number of smartphone users has surpassed that of basic mobile phones: 52 percent of respondents said they own a smartphone, versus 48 percent who use traditional mobile phones. In just two short years since Apple launched its first iPad, 20 percent of respondents now report owning some kind of tablet. And, five years after Amazon effectively created the eBook category, 20 percent of respondents now own an eReader. One-quarter of people also own a mobile media player (e.g., Apple iPod, Microsoft Zune), and almost 20 percent own a mobile gaming device.

All of these mobile devices now have Wi-Fi Internet access capabilities. In fact, with the exception of smartphones, Wi-Fi is now the predominant access technology for mobile devices (see Figure 1). Laptops, tablets, and eReaders almost exclusively connect to the Internet through Wi-Fi, with only approximately 20 percent having any mobile connectivity capability. Mobile media players and gaming devices generally have less connectivity capability and an equally low amount of mobile network connectivity. Smartphones are the only truly mobile network device, although three-quarters of respondents' smartphones are Wi-Fi enabled.

Figure 1. Device Network Connectivity (Owned Device).
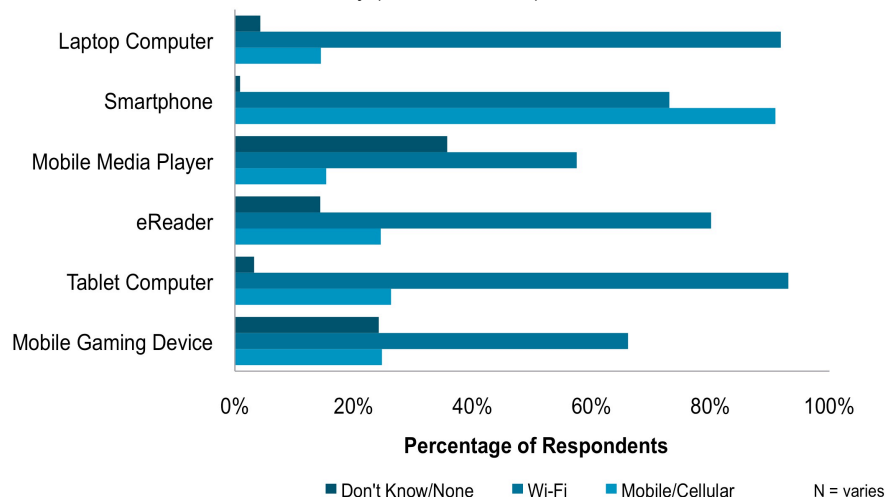
Q10. Please describe the wireless capabilities of each of the following devices that you own.

Source: Cisco IBSG, 2012

Daily usage of these mobile devices is high, although they are not always connected to the Internet. With the exception of laptops and smartphones, customers use their mobile devices approximately one to 1.5 hours per day, although they are connected less than half that time. Laptops are still the mobile device workhorse, with respondents reporting that they use their computers on average about three hours per day, most of which is spent wirelessly connected to the Internet. People are using their smartphones an average of two hours per day, yet they are engaged in connected activities only half of that time. Tablet computers are starting to reflect

smartphone and laptop usage patterns, with people using them an average of 1.6 hours per day, one hour of which is spent wirelessly connected to the Internet.

These mobile devices are used continuously throughout the day for a number of traditional mobile activities. Almost three-quarters of people use their mobile devices at least daily to make calls, send and receive emails and text messages, and browse the web. In fact, a quarter of people reported doing these core activities continuously throughout the day. About half of mobile device users visit social networks and use apps daily, and half of those users perform these activities at least several times in the day. However, consumption of mobile music, video, and games is much more episodic and has not yet reached the high daily usage levels of more traditional activities. Roughly a quarter of people play stored or online games, listen to recorded or streamed music, or read eBooks at least once per day. While 40 to 50 percent of people watch some recorded or streamed video on their mobile devices, less 20 percent reported watching them daily.

Home Is Where the Device Is

Mobile usage has definitely shifted to the home in a big way, as can be seen in Figure 2. All consumers use their mobile devices at home, averaging more than 2.5 hours of usage in a typical day—more than double the time they spend using them at work. Half of our respondents reported using their devices at work, where they typically spend an average of 1.7 hours using them per day. While two-thirds of people still use their devices on the go, the world of mobile devices is changing from a "mobile," on-the-go world (average usage of 0.5 hours per typical day) to a "nomadic" world dominated by the home (2.5 hours). And, people expect to increase their home use of mobile devices even more: 30 percent of respondents believe they will boost home usage within the next 18 months—the number-one location for anticipated increased use.

Figure 2.   Average Daily Device Usage by Location.

N=varies
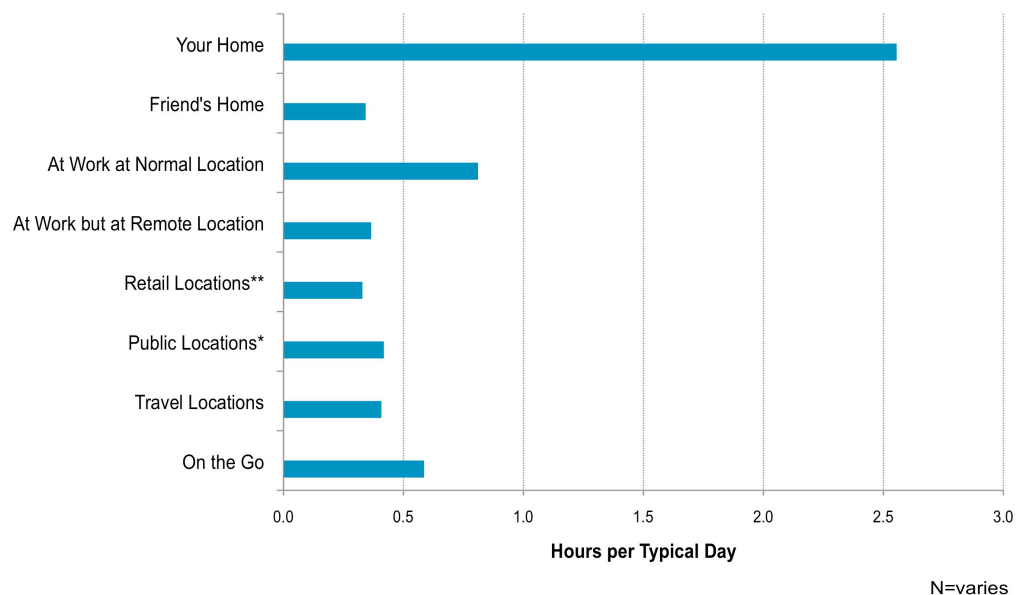
Q33. In a typical day, for how long do you use your mobile devices in each of the following locations?

* Public – e.g., stadiums, parks, schools
** Retail – e.g., stores, restaurants

Source: Cisco IBSG, 2012

Home, in fact, is the primary location for using all mobile devices. Among people using their devices in the home, between 80 and 90 percent reported that home was the primary location for using their laptops, eReaders, tablets, mobile gaming devices, and smartphones. Across the entire population, 70 percent of respondents use their laptops primarily in the home, while 46 percent indicated that home was where they use their smartphones most often. Remaining devices were used primarily in the home by roughly 20 percent of the population, reflecting the ownership penetration of various devices.

This distribution changes significantly when we look at the devices people use when on the go. Among respondents using devices on the go, two-thirds of smartphone owners and 48 percent of mobile media device owners (as witnessed by the glow from the backseats of minivans on the highways) indicated that this was the primary "location" for their device use. All devices (including laptops) had on-the-go usage rates in the low single digits with the exception of tablets, 15 percent of whose owners reported "on the go" as their primary location for usage.

Among respondents using their devices at a normal work location, 50 percent of smartphone owners stated that this represented where they primarily used their device. Interestingly, more tablet owners (26 percent) than laptop owners (17 percent) reported using their device primarily at work. Similar distributions were seen for people using their devices in retail locations (e.g., Starbucks, hotels) and public spaces (e.g., airports, train stations, stadiums). Smartphones (45 percent) are by far the predominant devices used in these locations, followed by tablets (19 to 21 percent), mobile media players (17 to 28 percent), eReaders (13 to 19 percent), and laptops (10 to 13 percent).

Wi-Fi or Mobile? That Is the Question

This shift to Wi-Fi-enabled devices and locations is clearly showing up in how users are choosing to connect their devices to the Internet. As Figure 3 shows, most mobile users are connecting their devices via Wi-Fi at some point, including 70 percent of smartphone owners. Approximately 50 percent of tablets, laptops, and eReaders are connecting exclusively through Wi-Fi. Although 30 percent of smartphone owners are connected only via the mobile network, the remaining 70 percent are supplementing mobile connectivity with Wi-Fi. In fact, on average, smartphone users use Wi-Fi one-third of the time to connect their devices to the Internet.

Even more astounding is that, with the exception of smartphones, users would prefer to connect all of their devices via Wi-Fi. Given a choice, more than 80 percent of tablet, laptop, and eReader owners would either prefer Wi-Fi to mobile access, or have no preference. And, just over half of smartphone owners would prefer to use Wi-Fi, or are ambivalent about the two access networks.

Figure 3. Current Distribution of Network Connectivity by Time.
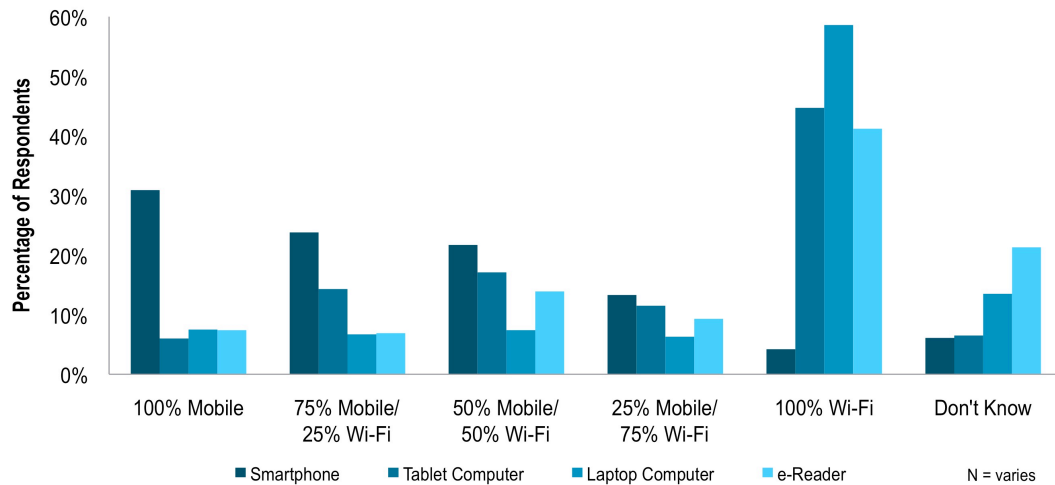
Q29. Of all the time you spend using mobile data (e.g., browsing the Web, using email, watching online video) on each of the following mobile devices, what percent of the time do you use a Wi-Fi network (i.e., connected to a wireless router or hotspot at a given location) versus a mobile/cellular network (i.e., over 3G or 4G mobile)?

Source: Cisco IBSG, 2012

Figure 4 reveals many of the possible reasons for this new attitude toward Wi-Fi connectivity. When asked which network they preferred, respondents chose Wi-Fi across all attributes with the exception of coverage. Also worth noting is that across most attributes, one-quarter of respondents saw no difference between the two networks. While Wi-Fi cannot compete with the now nearly ubiquitous coverage of cellular networks, what is remarkable is that people consider Wi-Fi easier to use and more reliable than mobile. And, despite the technical superiority of cellular mobility in the area of security, respondents clearly did not make this distinction. These data seem to indicate a huge gap between the technical reality and user perception across the key distinguishing attributes of the two access networks.

Figure 4. Preferred Network Access.

Attribute	Mobile/ Cellular	Wi-Fi	No Difference	N*
Lowest Cost	20%	56%	24%	746
Speed of Network	18%	58%	24%	800
Best Reliability	31%	46%	23%	794
Best Performance for My Applications	27%	46%	27%	759
Best Coverage	46%	35%	19%	792
Most Secure	34%	35%	31%	753
Easier to Use	29%	40%	31%	821

* Don't Knows removed from sample.

Q38. Thinking about Wi-Fi and mobile/cellular networks, which type of wireless network do you think offers the most desirable performance or features in each of the following areas?
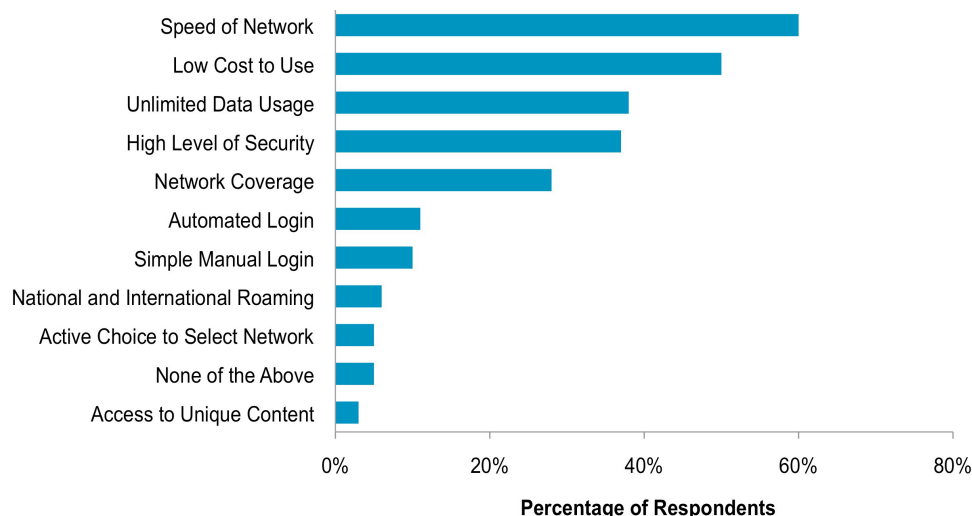
Source: Cisco IBSG, 2012

Mobile users are drawn to the speed and lower cost of Wi-Fi networks, but sometimes are challenged by the difficulty of locating access points and by variability in performance. As Figure 5 shows, users are choosing Wi-Fi over mobile connectivity based on cost advantages and because it doesn't impose data-usage caps or reduce their mobile data plan quotas. The top reason for choosing Wi-Fi, however, is that respondents find it much faster than mobile networks.

Interestingly, 40 percent of respondents named network speed as the top challenge to Wi-Fi. This no doubt reflects the huge variability in quality among Wi-Fi networks in the home, office, and public venues such as hotels and coffee shops. Of no surprise is that respondents also indicated that locating access points is an equally significant challenge

One thing is certain: people expect seamless integration within and across access networks. Ninety percent of respondents felt that a seamless handoff between Wi-Fi networks is important, with 65 percent saying it is "very" or "extremely" important. Equally, 85 percent of respondents felt that a seamless handoff between Wi-Fi and mobile networks is important, with 63 percent indicating that it is "very" or "extremely" important.

Figure 5.   Most Important Wi-Fi Features.*

* Don't Knows removed from sample.   N = 628
Q40. When you choose to select a Wi-Fi network, what are the most important features to you (select up to 3)?
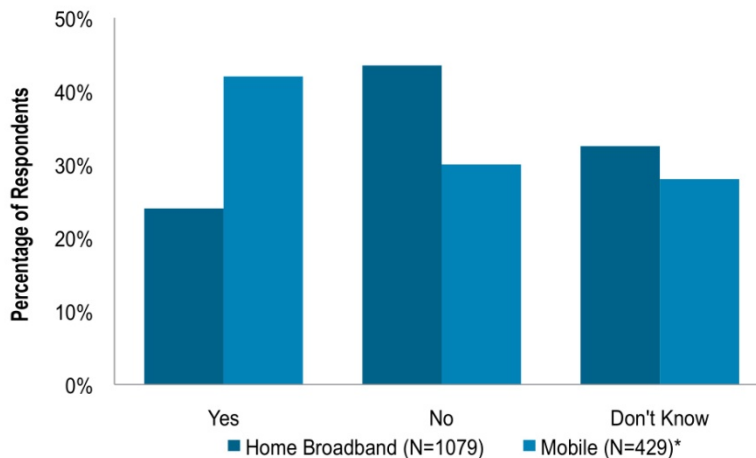
Source: Cisco IBSG, 2012

The New Mobile

One-third of mobile users take advantage of a public hotspot at least weekly, with 12 percent doing so more than once per week. The top locations for these more active users are public outdoors (e.g., parks, streets), coffee shops/restaurants, and retail locations. Remarkably, very few are paying for public Wi-Fi: three-quarters of regular users get their public Wi-Fi for free and 19 percent as part of a broadband subscription (8 percent), mobile plan (7 percent), or loyalty program (4 percent). Business-expense-friendly venues such as hotels, airports, and trains are the most popular locations used by the less than 1 percent of regular users who pay for public Wi-Fi access. When respondents were asked where they desired additional Wi-Fi

access, the top locations were parks and restaurants/cafés, followed by hospitals, grocery stores, subways, and retail stores/shopping malls.

Respondents are not sure if free Wi-Fi is part of their home broadband or mobile subscription. Paradoxically, although few U.S. mobile operators include public Wi-Fi access as part of their data plan (while most home broadband providers do as part of customers' subscriptions (as seen in Figure 6), most people associate free Wi-Fi with their mobile provider rather than their broadband company. People clearly seem to consider Wi-Fi a wireless technology more aligned to mobile than an extension of wired home broadband networks. One thing is for certain: this perception can be overturned with aggressive marketing and messaging to broadband subscribers. AT&T, Verizon, and Comcast all bundle some form of free Wi-Fi with their home broadband service, yet only one-third of their subscribers were aware of this. This contrasts sharply with Cablevision, 60 percent of whose broadband subscribers knew that Wi-Fi access was part of their subscription (most likely a result of Cablevision's aggressive marketing).

Figure 6.   Inclusion of Free Public Wi-Fi in Home Broadband / Mobile Subscription.

Q25/28. Is free access to public Wi-Fi hotspots (i.e., use of Wi-Fi outside of your home) included in your monthly broadband /mobile subscription?

* Respondents indicating that they had a mobile voice or data plan

Source: Cisco IBSG, 2012

Broadband providers bundle free public Wi-Fi access with their subscriptions as a means of retaining customers. But does it work? As Figure 7 indicates, free Wi-Fi is an important factor in subscribers' choosing to stay with their broadband provider. Almost two-thirds of respondents who knew that free Wi-Fi access was bundled with their home broadband subscription indicated that it was a "very" or "extremely" important factor in their choice of broadband provider. Equally, half of all respondents indicated that they were at least moderately likely to switch broadband providers if they were offered free public Wi-Fi, with 22 percent saying that they would be "very" or "completely" likely to switch. Not only does the inclusion of free public Wi-Fi seem to be effective in retaining existing broadband customers—it may also be a means of attracting new ones from competitors.

**Figure 7.** Importance of Free Wi-Fi in Broadband Provider Choice.*
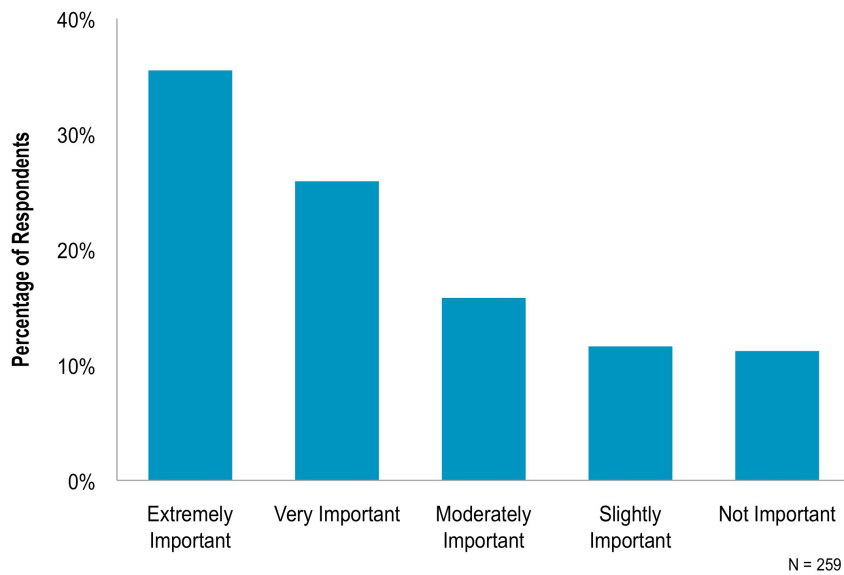
Q26. How important was free access to public Wi-Fi hotspots in your choice of home broadband service provider?
* Respondents answering "yes" to "bundled in subscription"

Source: Cisco IBSG, 2012

The results of the research seem to indicate that we may be on the verge of a "New Mobile" paradigm—one in which Wi-Fi and mobile networks are seamlessly integrated and indistinguishable in the mobile user's mind. While users may recognize that there are differences between access networks, Figure 8 indicates that customers are interested in a New Mobile world that combines different access networks to provide pervasive mobility in a cost-effective, seamless, and unlimited data offering. Almost 60 percent of respondents (an average of 3.5 out of 5) were "somewhat" or "very" interested in a proposed offer that provides unlimited data across combined access networks for a flat monthly fee. Unsurprisingly, the biggest perceived benefits were lower overall costs and unlimited data, signaling the end of uncertainty about overage charges. However, more than one-quarter of respondents liked the location flexibility, reliability, and seamless transfer between networks that this proposition offered.

Figure 8.   Interest in Bundled Flat Fee for Mobile/Cellular and Wi-Fi Access.
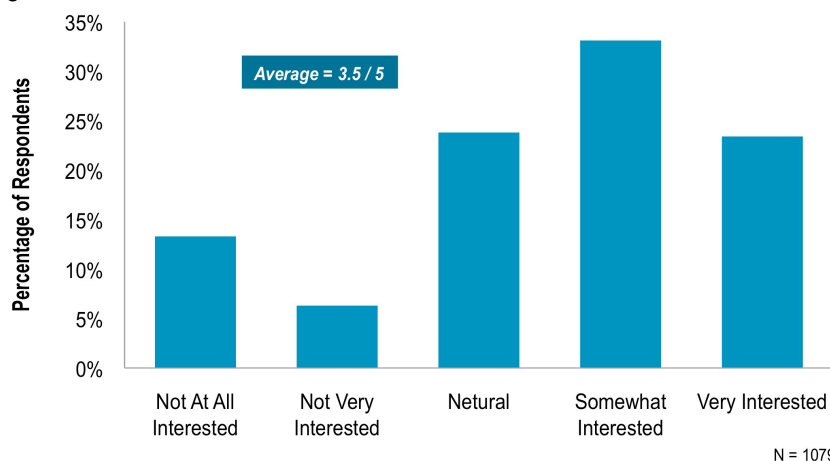
Q48. Imagine a service in which you pay a low flat fee for a combined mobile/cellular and Wi-Fi solution with unlimited data access throughout the country (does not include voice service). Your service provider will seamlessly transfer your service to the lowest-cost and best-suited network with no degradation of quality. This offer would replace your current mobile data plan and would be at least the same cost, or lower, than your current data plan.

Source: Cisco IBSG, 2012

New, Innovative Business Models

To date, most service providers have viewed Wi-Fi as a means to offload some mobile data traffic and help retain customers. However, SPs are beginning to evaluate Wi-Fi business models that provide advantages beyond offloading and retention. Cisco IBSG wanted to test customer interest in some of the key alternative business models that we outlined in a recent paper on Wi-Fi monetization.[2] Specifically, we tested five business models, with the following results:

Model 1: Accepting general advertising for free Wi-Fi access. Average interest of 2.9 out of 5, with 37 percent being "somewhat" or "very" willing to accept advertising for free access. The biggest reasons for not accepting it were: 1) inconvenience—not worth the money; 2) ads slow me down; 3) concerned about sharing personal data; and 4) already have access to free Wi-Fi.

Model 2: Accepting personalized marketing for free Wi-Fi access. Average interest of 2.8 out of 5, with 32 percent being "somewhat" or "very" willing to accept advertising in exchange for free access. The biggest reasons for not accepting it were: 1) don't want retailers to have personal information; 2) ads slow me down; 3) inconvenience—not worth the money; and 4) don't see enough value in personally targeted offers.

Model 3: Secure Wi-Fi access to remotely stored content in a digital locker. Average interest of 3.1 out of 5, with 43 percent being "somewhat" or "very" interested in the offer. The biggest perceived benefits were: 1) lower overall cost; 2) unlimited data/no overage; 3) reliability; 4) flexibility of location; and 5) security/privacy of data.

Model 4: National/international Wi-Fi roaming. Average interest of 3.3 out of 5, with 52 percent being "somewhat" or "very" interested in the offer. The biggest perceived benefits were:

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[2] "Profiting from the Rise of Wi-Fi: New, Innovative Business Models for Service Providers," Cisco IBSG, March 2012.

1) lower overall cost; 2) unlimited data/no overage; 3) flexibility of location; 4) no roaming charges for mobile; and 5) security/privacy of data.

Model 5: Enhanced in-store shopping experience (e.g., product information, mapping, coupons). Average interest of 3.1 out of 5, with 42 percent being "somewhat" or "very" interested in the offer. The biggest perceived benefits were: 1) efficiency while in the store; 2) personalized deals and coupons; 3) enhance my shopping experience; and 4) no additional access charges.

Responses to these new Wi-Fi business models indicate that consumers are not particularly interested in receiving advertising as a means of gaining free Wi-Fi access. People perceive this advertising as more trouble than it is worth, and the vast majority of people stated that they already have access to free public Wi-Fi. However, they are interested in targeted marketing delivered directly to their mobile devices as part of an enhanced in-store retail experience. Equally, mobile users would value access to a national or international network of public Wi-Fi hotspots that would help them control their mobile connectivity costs and minimize the challenges of finding public access points. Mobile users are also interested in being able to securely access their digital content across multiple devices via lower-cost, faster Wi-Fi networks.

Moving to the New Mobile

New devices, changes in customer behaviors, and technological advances are rapidly pushing the use of Wi-Fi as a wireless access technology by mobile users. Cisco IBSG's mobile connectivity research clearly demonstrates that consumers are adopting Wi-Fi to connect their growing portfolio of mobile devices to the Internet. Many users, in fact, seem to prefer Wi-Fi to using traditional mobile cellular networks for wireless connectivity. While mobile users recognize that there are differences between the two access technologies, most see them as part of a seamless, integrated means to gain the constant connectivity that their mobile lives and devices demand. Many mobile providers may see this as a threat to their traditional mobile business. However, Wi-Fi does offer new opportunities to enhance the overall mobile customer proposition and experience, and commercialization models.

Service providers must consider several important implications and potential strategies to position themselves to capture Wi-Fi opportunities:

- **Incorporate Wi-Fi as an integral part of the portfolio.** Use pricing, marketing, and new technological solutions to create compelling and integrated offers and solutions of value to mobile users. Create new Wi-Fi business opportunities to non-cellular "nomadic" devices, such as tablets and eReaders.

- **Target Wi-Fi use in the home.** Create solutions and incentives to encourage users to offload mobile traffic at home, while retaining the ability to provide a unique and differentiated customer experience.

- **Explore new ways to make money from Wi-Fi.** Augment the typical offload business models with new and innovative Wi-Fi business models, such as churn reduction, enhancing retail experiences, managed services, and new, seamless offers.

- **Deliver on the New Mobile.** Align network architectures and deploy appropriate technologies to deliver a seamless, integrated mobile-Wi-Fi user experience.

As demand for mobile devices and network connectivity continues to grow, both Wi-Fi and traditional mobile networks will be critical to meeting the needs of mobility-enabled consumers.

SPs are in an enviable position of being able to successfully integrate these networks and the experience of their customers to provide what the market wants: New Mobile. To deliver the New Mobile, SPs must focus on advancing the technology, business innovation, and their understanding of mobile users' needs. This will enable them to develop offerings, new business models, pricing and sales-and-marketing strategies, and tactics that successfully address the requirements identified in this paper.

About the Survey

Cisco IBSG conducted an online survey of 1,079 U.S. mobile users in March 2012. The survey base was representative of the U.S. population in terms of age, income level, physical distribution, and employment status. Respondents reported using Wi-Fi in the following locations: home (56 percent), work (20 percent), and public (27 percent). Respondents' home broadband technology consisted of the following: cable (40 percent), DSL (30 percent), and fiber (8 percent). Fifty-eight percent of respondents were employed: full-time (46 percent) and part-time (12 percent). The remaining 42 percent were not employed: stay at home (9 percent), student (9 percent), unemployed (11 percent), and retired (13 percent). Fifty-two percent of respondents described the area in which they live as suburban, while other living environments consisted of urban (23 percent), rural (15 percent), and semi-rural (10 percent).

The study was also undertaken in Brazil, Canada, Mexico, and the United Kingdom.

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