Telecom Outlook Report on Wireless
What Lies Ahead: Understanding Customers' Requirements in Demanding Times

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The Telecom Outlook Report (TOR) has sought to pinpoint the current state of thinking in the telecom industry since 1987. Based upon a comprehensive survey of industry experts, the TOR presents findings about customer requirements for services, devices, and infrastructure in the mobile world. The TOR experts provide forecasts and supporting rationale about the future of the industry and the business models that will ensure a profitable future for the wireless telecom industry. This white paper provides a few select findings and introduces a few of the overall themes that are developed in the full report.

OVERVIEW

High-speed data services and the requisite demand will not materialize overnight. In the meantime, service providers need a realistic vision of the future based upon careful attention to social and cultural factors. From this foundation, they can develop services and applications that will enhance people's lifestyles in a measurable way. The TOR wireless experts clearly believe that, above all, mobile data services must be simple and convenient. Understanding what this entails again requires looking closely at how people use their wireless devices today and extending these behaviors to a broadband environment.

Cooperation among Wireless Players

The TOR wireless experts believe that providing mobile data services successfully will require expertise from a variety of players in a carefully coordinated manner. There is much talk about the importance of the value chain in the industry, which the TOR wireless experts acknowledge as important. However, the optimal form and management of these relationships is a matter of debate. Some describe it as an "eco system" or a network, or as a more highly structured organizational form along the lines of the Japanese keiretsu[1].

Considerations for Growth of the Enterprise Market

Contrary to many industry analyses, the TOR wireless experts do not see a clear time frame for the near-term emergence of m-commerce in either the consumer or enterprise arena but do anticipate growth after 2006, when the technical, social, and economic hurdles have been surmounted.

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[1] A network of businesses that own stakes in one another as a means of mutual security, especially in Japan, and usually including large manufacturers and their suppliers of raw materials and components. Source: http://www.keiretsu.de/

The experts note considerations in the enterprise market—namely, security, and reliability of wireless solutions. Belt-tightening has led to greater scrutiny of information technology (IT) spending, so providers must understand and communicate the benefits to corporate customers in terms of cost and efficiency savings, in addition to overcoming concerns about security and reliability.

Performance and Quality of Network

In terms of network requirements, the TOR wireless experts acknowledge present-day challenges such as limited coverage and dropped calls as important obstacles to developing customer interest in value-added mobile data services.

In addition to concerns about performance and quality, the TOR wireless experts emphasize the necessity of low prices above many other variables, including the introduction of new access devices, higher access speeds, and multimedia content.

Evolution to Wireless Data

Overall, the TOR wireless experts hold that innovative services are needed, but, at the same time, the industry is looking for proven technologies and services. The answer to these seemingly contradictory aims is to examine the services that customers find compelling at the moment. The experts identify simple communication: e-mail, messaging, and voice. Evolving to a wireless data environment may best be accomplished by first examining how people currently use their mobile phones. Although there is a place for entertainment products via mobile devices, especially with younger consumers, to achieve the mass penetration necessary to support network investments, service providers would be better off focusing on how to make people's lives better and easier in a substantial way.

A confluence of economic factors has forced a shift of priorities in the wireless industry from voice service to a focus on faster transmission speeds, greater efficiency, and more robust networks to support advanced data services. Difficulties have been encountered with the deployment of 3G networks, yet some surprising success stories with mobile technologies are being observed around the world. Amid the mixed signals, initial enthusiasm has been tempered with the reality of the complex value chain that must be managed for wireless data services to succeed.

The experts not only see technical challenges to providing consumer and enterprise data services, but also assert that social factors must be acknowledged. Since many wireless data services are predicated on a multiplier effect, widespread uptake will mean that customers will modify their behaviors and shifting activities to use mobile technologies. The lifestyle changes required can occur only if all of the pieces of the value chain are coordinated.

Wireless Data Services: New Hope for the Industry

The industry press has heralded wireless data services and mobile commerce, predicting a large-scale shift in the way consumers carry out their daily activities. Wireless broadband is anticipated to have an enormous impact on daily life and corporate business processes, yet it is not yet clear how this far-reaching transformation will take place. As Japan's NTT DoCoMo struggles to generate revenues outside its

home market, the transferability to other markets is a matter for discussion. Voice revenues will continue to increase on a global basis, but many questions still surround the practical issues of generating services and providing data access to the consumer. Even if these hurdles are met, there still remain concerns about the kinds of services for which consumers will pay.

Laying the Groundwork

The wireless industry has some reason for optimism. By the end of last year, fully half of the U.S. labor force already had wireless voice, pagers, or mobile computing devices. Interestingly, the smallest U.S. companies will soon account for the largest group of wireless business users in the country. Some estimate that one-third of the world's population will own a wireless device by 2008. The growing ubiquity of the mobile phone indicates that wireless communication is valued throughout the world regardless of cultural, geographic, or economic differences.

Challenging Times Propel Industry Consolidation

As the industry moves to develop more sophisticated devices such as smart phones, ironically, the TOR wireless experts maintain that simplicity and convenience are the qualities that customers value most from mobile communications. This finding implies that entertainment and applications lacking productivity benefits are not the keys to mass-market adoption. Clearly, the youth market in Japan, South Korea, and Western Europe have embraced ring tones, games, chat services, and other amusements. But the TOR results indicate that the overall global market will move forward with useful and easy services and devices. Part of the challenge in moving to wireless data services involves a clear understanding of wireless behavior and needs across diverse contexts.

Rollout of Broadband Wireless Networks after 2006

As shown in *Figure 1-1*, the TOR wireless experts do not expect wide deployment of broadband wireless networks until after 2005 (less than one-third of the experts) or after 2006 (nearly 60%). Very few experts expect wireless broadband by 2003, noting the general difficulties of 3G network deployment.

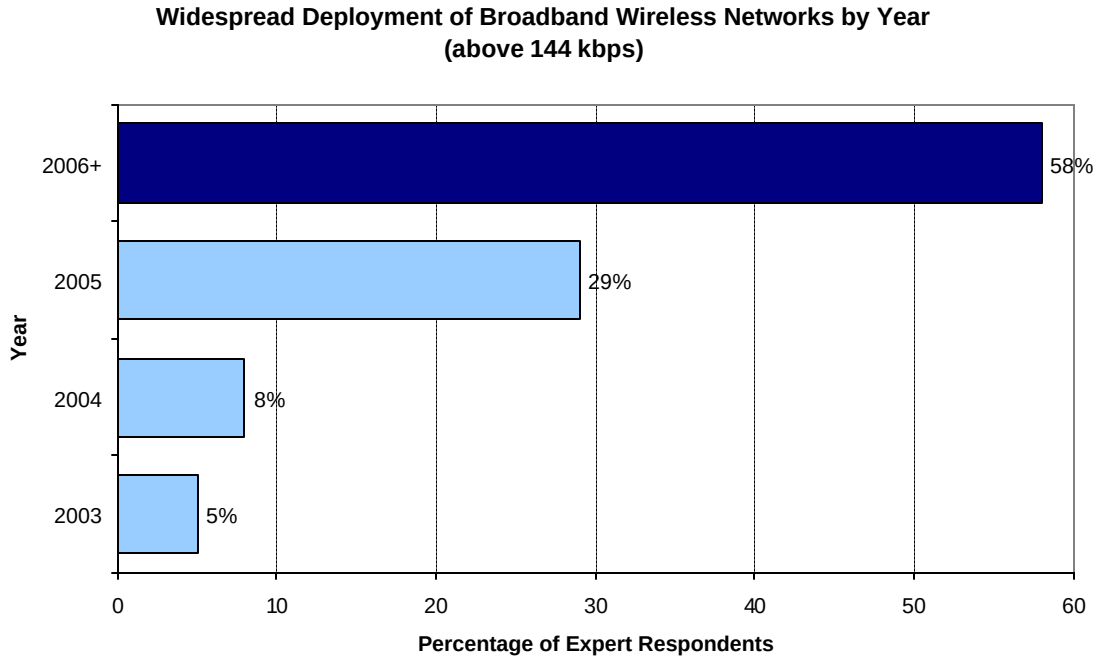

Figure 1-1

The TOR wireless experts' forecast is consistent with previous surveys of the Telecom Outlook Report's expert panels who have focused on network upgrades, network coverage, and quality of service (QoS) as important issues that need addressing.

The First Killer App of the Wireless Internet

Not surprisingly, fully 84% of the TOR wireless experts believe e-mail access is an indispensable feature affecting consumers' use of the wireless Internet (see *Figure 1-2*). Like voice, wireless email meets the criteria of convenience and simplicity that the experts believe are the key drivers of user preferences for handheld devices.

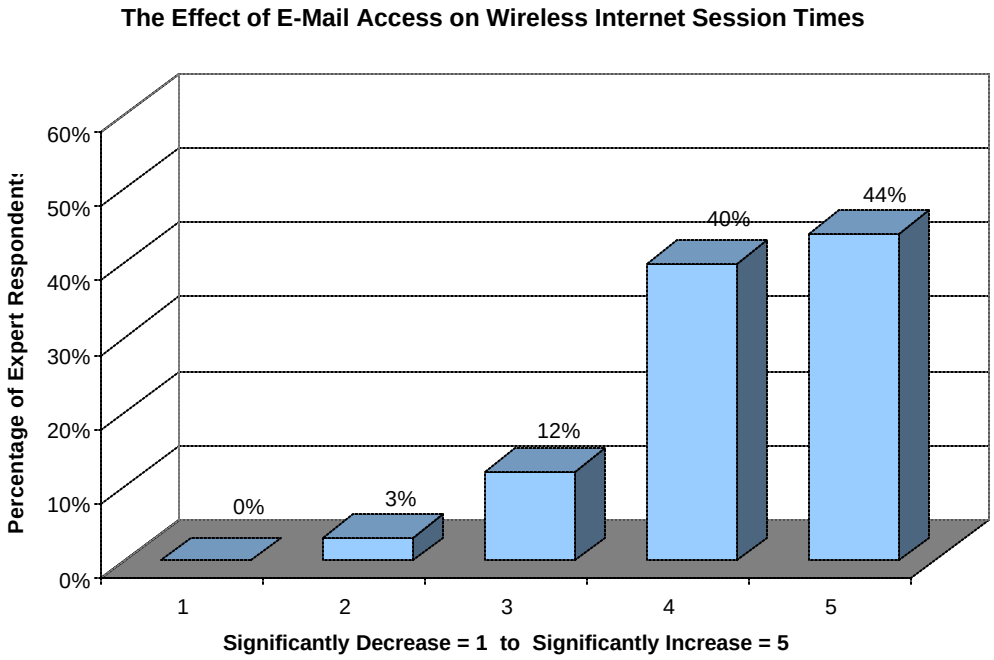

Figure 1-2

The implication is that service providers should concentrate on offering services that have proven their worth in other contexts. Leveraging simple communication services like email and voice, wireless players can then tailor and sell other advanced mobile services around these convenient offerings.

Customers Want Mobile Access to E-Mail

E-mail is more important than most other features, including faster access speeds, messaging, increasing multimedia content, or new access devices.

M-Commerce in 2003

Fewer than half of the TOR wireless experts see progress in m-commerce by 2003, with 44% of them anticipating that less than 10% of the on-line shopping market will be conducted wirelessly (see *Figure 1-3*). Another third of the experts sees higher growth, with between 11% and 20% of the on-line shopping market being captured by mobile commerce. On average, the experts see 14% of on-line shopping being conducted via wireless devices by 2003.

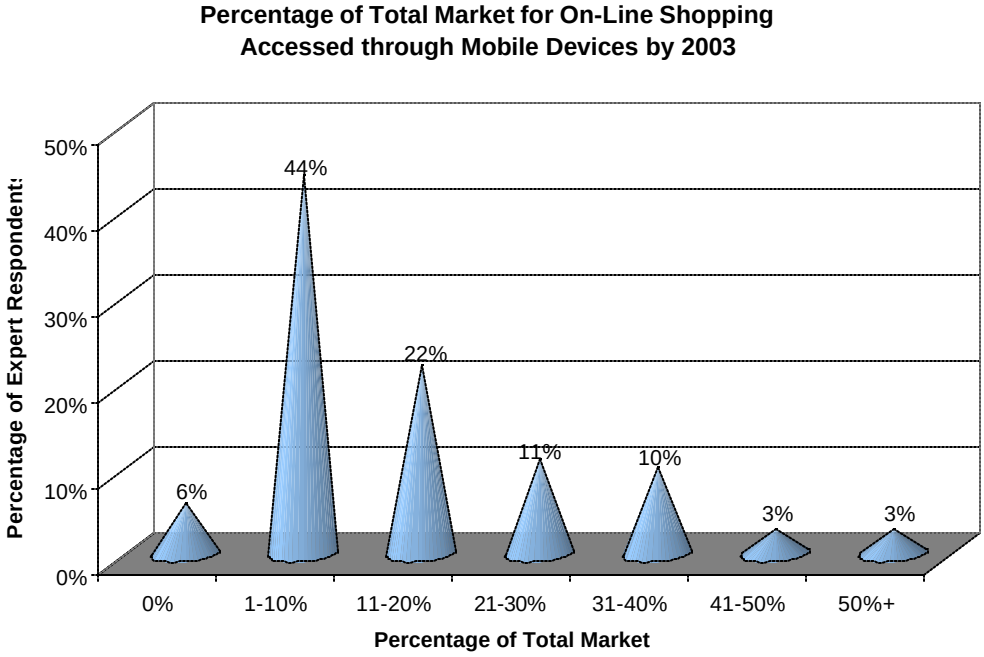

Figure 1-3

Looking to Japan's i-Mode service for clues as to where the global m-commerce market may be headed indicates that, although a good deal of commerce is being conducted, it is still largely limited to screensavers and ring tones.[2] Although the data is still scarce, it appears that Japanese customers are not yet purchasing goods over their phones.

There are many similarities between shopping on-line at home or via a wireless device. But the kinds of shopping that a wireless device makes possible inevitably exploit characteristics such as personalization, positioning, and timeliness.[3] Given the limited screen size of a mobile device, personalization could filter out extraneous information, using customer profiles. Timeliness and location-related considerations also have been identified as significant—tickets, reservations, and other products that can be digitized offer the promise of greater convenience and efficiency for consumers.

[2] John C. Beck, Accenture Report, "Outlook – Seven myths about Japanese m-commerce," 2001.
[3] ibid.

E-Commerce versus M-Commerce

Internet consumers are already well aware of both the convenience and savings that shopping on-line can provide, but the costs involved in offering e-commerce to consumers was greater than anticipated. In addition, for non-digitized products, there have been logistics and distribution challenges. The lingering question is whether online shopping through mobile devices will face similar challenges.

At the same time, it is projected that the number of wireless Internet users as a percentage of all Internet users will increase during the next five years. In other words, whereas now less than 20% of all Internet users worldwide access the Internet via mobile devices, that percentage may increase dramatically by 2007, even as the actual number of Internet users nearly triples.

But the widespread espousal of m-commerce will largely depend on security, cost, and convenience. Concerns about security and privacy are a primary psychological obstacles, particularly in the mammoth markets of Asia. This is true even in Japan, inarguably the most fertile ground for mainstream acceptance of mobile commerce, where more than 70% of portable device owners access the Internet via their gadgets.

M-commerce, just like e-commerce, will have some specific services that will have the potential to be profitable. Services must be tailored to customers' behavior and must take into account how and when people use mobile devices.

THE ENTERPRISE MARKET: WILLING AND READY?

Corporate Customer Requirements: Security, Reliability, and Savings

With many companies skeptical these days about investing in solutions, the benefits of adopting mobile technology must be clear. Enterprise customers must have services that are reliable and easy to use, especially when a particular technology is yet unproven (see *Figure 1-4*).

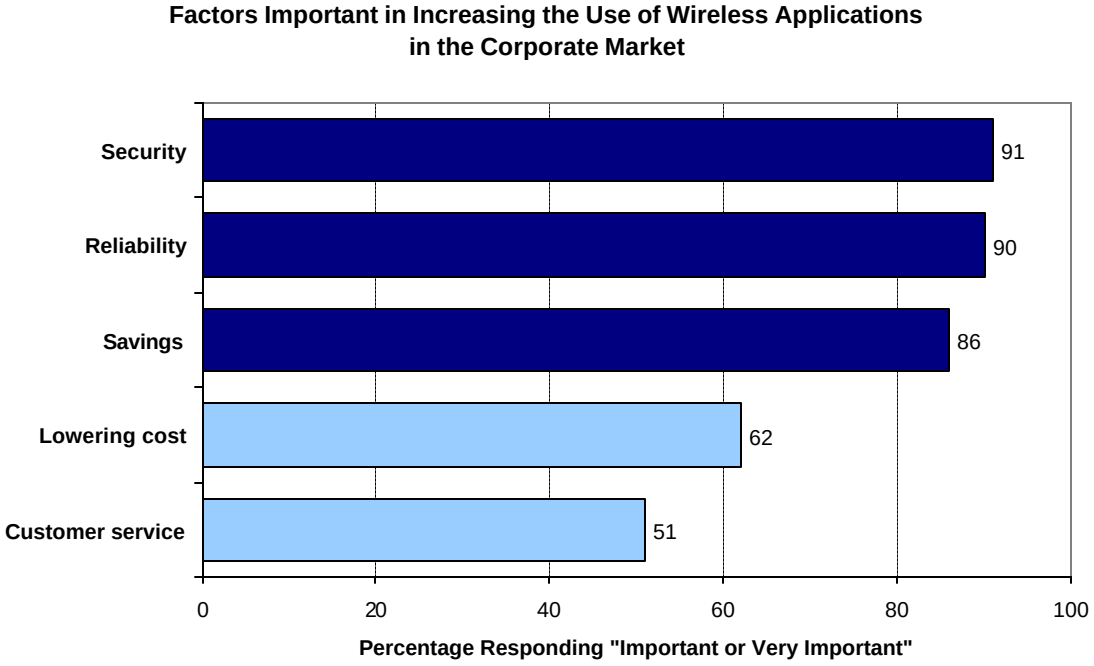

Figure 1-4

Justifiably, companies have concerns about implementation. The time required and the issues concerning integration with current IT systems should be clearly manageable and apparent. With fresh memories of the cost, time, and manpower required to shift to e-business, the enterprise customer is somewhat wary about investing in new services. Current research suggests that companies are aware and interested in the productivity potential of wireless solutions. However, there are still negative perceptions of network reliability and security that need to be overcome. Wireless operators have not thus far sold customers on the value of wireless e-business. Establishing relationships with the IT partners that are already working with particular customers is an important part of aligning a company's wireless and IT strategies.[4]

[4] "75% European Corporations will Implement B2E Enterprise Wireless Applications major new study reveals today," *Mobileinfo*, Issue #2002 – 37, September 2002.

Security and the Corporate Market

Mobile computing has just barely begun to be used in the corporate environment, and it is clear that there are a number of issues that still must be overcome before the deployment of wireless applications will be possible.

Mobile networks must measure up in security to stimulate the corporate market.

Security is a critical issue in this realm, as shown in *Figure 1-5*, but wireless networks still lack a number of the controls that businesses see as fundamental to their operations.

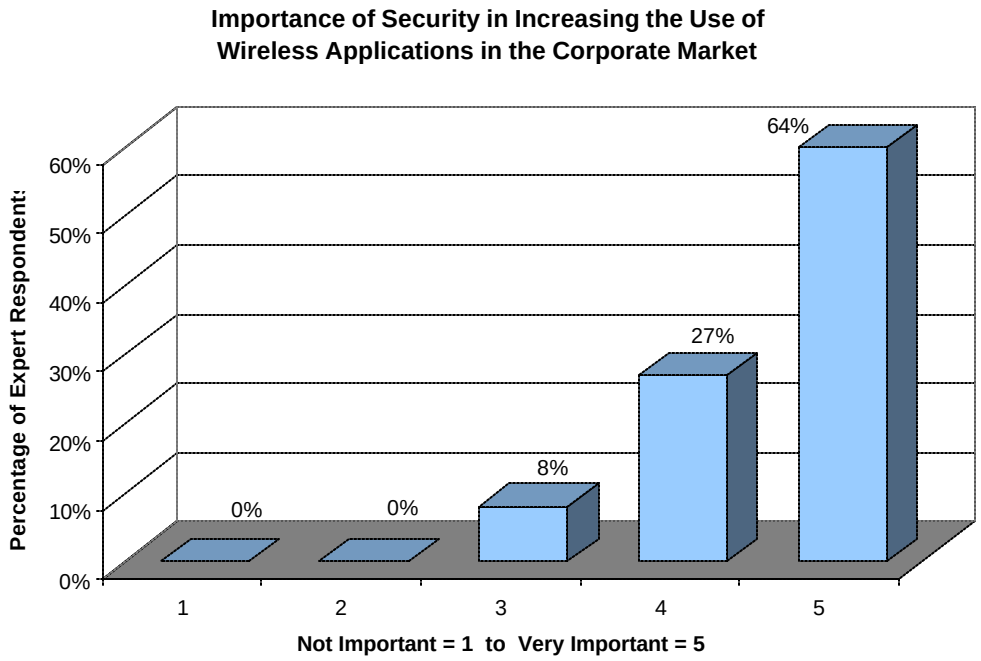

Figure 1-5

Wireless Access in the Corporate Market: Near-Term Outlook

Even in most developed markets for mobile services, the business sector is lagging behind consumer services (see *Figure 1-6*). Accordingly, the TOR wireless experts estimate that the mobilization of advanced back-end systems will not likely occur until after 2005. This is a more sober assessment than that of some analysts who anticipate that the infrastructure to mobilize enterprises will be in place within the next three years.[5] In the current economic climate, caution about technology investments will undoubtedly affect adoption rates. However, the TOR wireless experts also cite bandwidth as the key issue in need of resolution before mobile data services can expand.

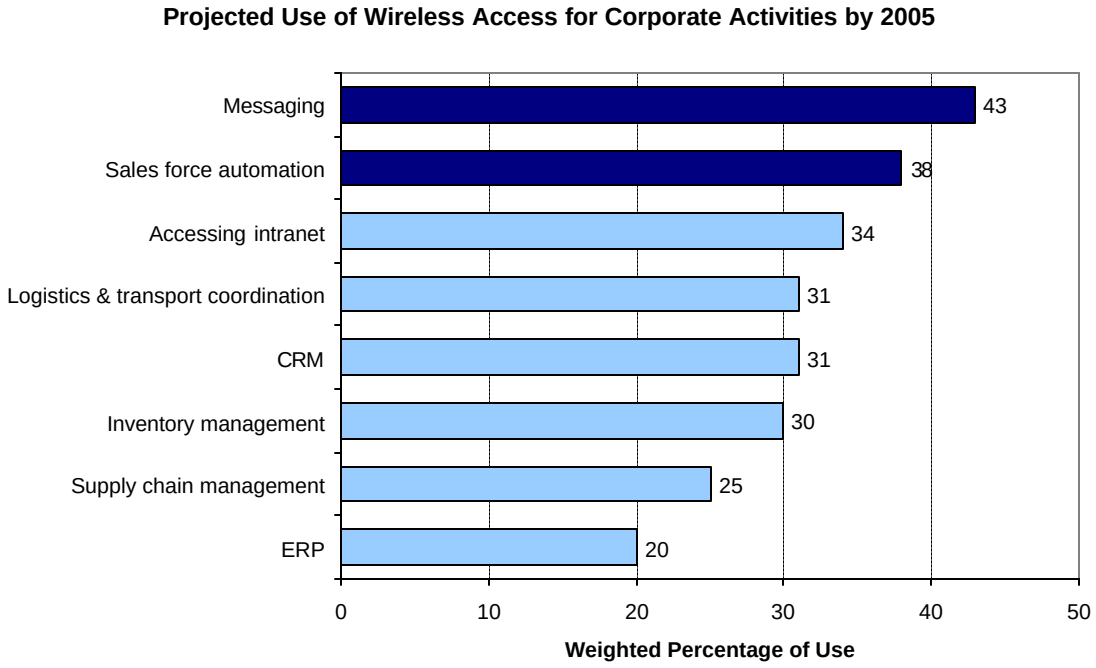

Figure 1-6

[5] Datamonitor notes that most companies are undergoing belt-tightening at the moment but that, despite this, mobile infrastructure spending will increase in the next few years, most notably after 2003 due to technological improvements, falling solution costs, and a more evident ROI. Datamonitor, "Mobile Enterprise Infrastructure: The cost of going mobile," February 2002, p. 97.

The First Step: Simple Voice and Text Messaging Services

The TOR wireless experts are optimistic that mobile messaging will be deployed in the corporate market within the next three years (see *Figure 1-7*).

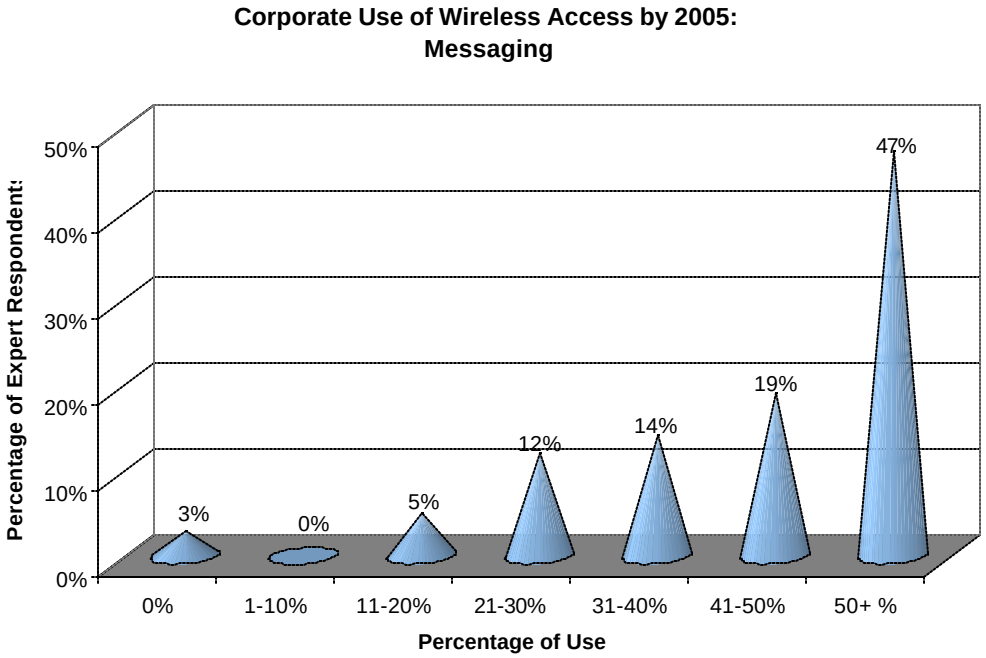

Figure 1-7

A natural evolution to more advanced mobile services can be inferred from the TOR wireless experts' responses. Given the current economic stagnation, companies are less inclined to extend their systems to wireless access. Thus, mobile e-mail and SMS capabilities are the most likely applications to develop initially.

CONNECTIVITY: THE DEVICES

What Do Users Want?

Above all else, consumers want mobile devices that are easy to use (see *Figure 1-8*). The attractiveness and personalization options of handhelds are much less valued qualities.

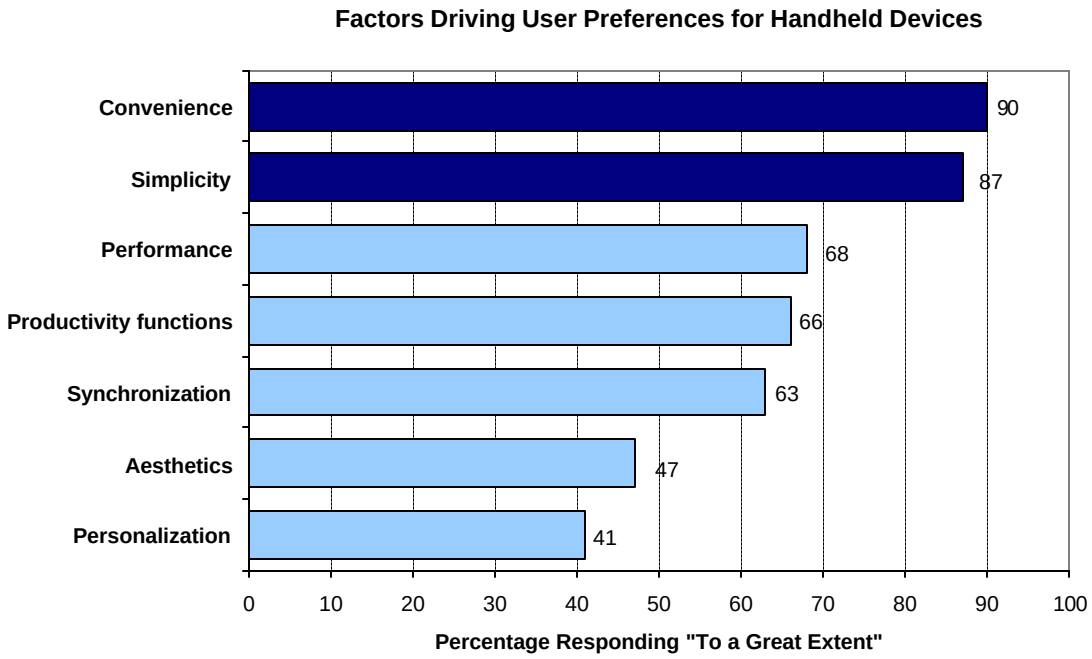

Figure 1-8

Convenience and simplicity are key features that customers value in their mobile devices.

While personalized ring tones and overall aesthetics are appreciated in markets such as Japan and Europe, this is not the case in the United States, where the cell phone is generally regarded as a tool rather than a toy.

CONCLUSIONS: GETTING TO WIRELESS BROADBAND

Connectivity: "Bit-Pipe or Value-Added Service Provider?"

Although most recent discussion in the industry has focused on content, the TOR wireless experts are also concerned with the underlying technologies, including the operation of network equipment as well as handset manufacturing. Even more significant are the social and contextual considerations that must be factored into the offering of services that meet customers' needs for convenience and simplicity. These needs may vary in line with time and space differences, population density, and transport preferences.

Devices

The TOR wireless experts recognize the need for new mobile devices that are easy to use and functional. Consumers will not be compelled to access the wireless Internet unless their interface is simple and convenient.

Content: Still a Disconnect for Commerce

"Realistic" best describes the TOR wireless experts' views of the emerging mobile wireless Internet. Along the path to interactive services, customer satisfaction with simple communication services must be attended to. The initial markets in the corporate and residential markets will focus on messaging and voice-based services. Next, sales-force connectivity will emerge in the corporate market, while in the customer market, services that help make life easier and more convenient will be most suitable, especially in the North American market.

Mobile Commerce: Current State of the Wireless Market in the United States, Asia, and Europe

Clearly, the United States is pursuing a gradual transition to 3G services, while South Korea and Japan, among other countries, are moving more rapidly. The varying trajectories that are currently evident arise from complex influences that include technological conditions, firm strategies, as well as the cultural, economic, and regulatory contexts of different markets.

Emerging Markets

The big story of the last year has clearly been Asia's enthusiasm for mobile voice and data. Pockets of activity in Japan and South Korea have roused hope for the viability of wireless data in other markets.

The TOR wireless experts predict continued growth for voice services in developing economies, including China, South America, and Eastern Europe. Less consensus exists around the adoption of m-commerce, either in the consumer space or in the B2B arena. This sentiment confirms the experts' views that specific types of services will be successful but that many of the products and services that have been proposed cannot be sold profitably via a mobile device.

The TOR wireless experts put forth a realistic vision of the path toward wireless data services, citing the groundwork that must first be established before markets will emerge. Service quality and performance are still key considerations, given that voice remains the killer app. New applications and services will likely evolve from the voice environment. Thus, getting to wireless broadband requires close attention to the behavior of wireless users in the present. Given their mobility, customers using wireless voice will display different behaviors than wireline callers. As a result, wireless players must think about interactive services from a new perspective. Learning about the social factors and customer requirements in the wireless world is the work that must be done in the meantime before wireless broadband is unveiled.

There are challenges and opportunities for devices, applications, and infrastructure. The pockets of growth observed in South Korea, Japan, and elsewhere provide clues, but understanding the applicability of these various success stories requires careful consideration of other markets, such as the United States.

Operators should anticipate an evolutionary take-up of m-commerce applications. Initially, enterprises will use mobile e-mail, messaging, and sales-force automation applications but will wait until they can justify the cost and effort of implementing more advanced applications such as ERP, which require higher-speed transmission and heavier integration with corporate systems.

Creating Connections through Partnerships

The TOR wireless experts believe that the success of the mobile Internet will rest on the growth of long-term relationships between a diverse set of players, each of whom contributes to the complex value chain that will define mobile broadband. The management and cultivation of these partner webs will be vital to the growth of the industry.

Overall, the TOR wireless experts believe that a large market exists for mobile wireless services, though technological issues remain in terms of network deployment, along with questions about standards, spectrum, and interoperability. Attractive pricing of services will also be a challenge and require careful calibration of investment in high-speed services.

Services that cut across the swath of customer profiles offer the most reasonable chance of producing revenues. In the U.S. market, this suggests the development of wireless services that will improve the convenience of consumers' everyday lives.