



Technology: Mobile Internet United States

Mobile Internet Primer

Portfolio Manager's Summary

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Mobile Internet Primer (Part I)—an explosion of opportunities.

The mobile Internet is a land grab and everybody wants in.

Companies are competing for customer mindshare and a larger share of future mobile commerce revenues. Winners will offer a personalized, easy-to-use platform with rich content.

Operators and portals are battling over who will own the mobile customer

While the winners are unclear, much will depend on who is best positioned in the minds of customers today and who can provide the optimal user platform that is deep in content, yet personalized and easy to use. Initially, the relative penetration of mobile phones versus PCs with Internet access will help determine whether operators or portals have an upper hand.

Cross-platform scale will determine the long-term winners on the consumer side

Tomorrow's mobile Internet will include a proliferation of applications and devices that will all be linked to the Internet via IP protocol. Achieving scale across multiple devices and connectivity platforms (wireless, narrowband, and broadband) will determine the winners.

Early opportunities exist in the enterprise and software infrastructure sectors

The need to manage mobile workforces has created demand for access to the corporate intranet as well as sales force automation tools. Personalized applications and location-based services will play a large role in the success of future applications built on 2.5G and 3G technologies. Software and service providers will be key to helping businesses become m-enabled while focusing on their core competencies. Companies will outsource functions such as mobile server hosting, content and application development, and fulfillment because of limited internal human resources and economies of scale in these new technology areas.

New personal appliances will vie to be primary mobile portals

The new Internet-enabled personal appliance will soon increase mindshare with end users. Both wired and wireless portals will need to fulfill user expectations of seamless convenience across multiple platforms on both types of networks. The challenge of providing compelling content on a small, mobile screen is sufficiently different from that of the large-screen tethered e-Commerce world. Cross-industry co-opetition will play a larger role and will potentially require new approaches and business models.

Despite its long-term promise, today's mobile Internet faces some grim realities

The mobile Internet must overcome significant hurdles to achieve mass-market adoption. Mobile Internet users are faced with high prices, slow access speeds, limited content, entrenched pricing/distribution models and disparate global standards. The mobile Internet is not yet ready for many of its optimal uses because of wireless device limitations, including short battery life, and the challenges of deploying location-based technology, voice recognition and proximity-based networking. Finally, changes in consumer behavior and adoption may take longer than expected.

Market estimates

The overall market estimates for data access revenues, m-Commerce and advertising are still unclear. All three of these are driven by eventual customer adoption. How quickly and to what extent customers adopt the mobile Internet are lurking questions, especially in light of today's slow data transmission speeds, incompatible global standards, limited functionality and lack of available content. However, early signs are encouraging. NTT DoCoMo's i-Mode service in Japan, one of the first widely deployed, Internet-standards based services, has exploded in popularity; over eight million subscribers have signed up since February 1999, making it the fastest-growing Internet access provider anywhere. We believe that as global technology standards converge toward 2.5G and 3G solutions in 2001-2005, and customers harness the capabilities of the mobile Internet, we will see mass-market adoption. Our wireless analysts expect mobile Internet subscriber penetration in the US to rise to 113 million subscribers, or 55% of mobile voice subscribers, by 2005 and to 223 million or 80% by 2009. Based on their estimates, this translates to \$18.5 billion of data access revenues, \$2.4 billion of m-Commerce, and \$1.2 billion of advertising revenues in 2005.

The m-Commerce opportunity

Today, m-Commerce represents a significant opportunity for companies to increase revenues, improve customer service and build their brand. In order to capitalize on the m-Commerce opportunity, companies need to realize that m-Commerce cannot be treated simply as an extension of their e-Commerce strategies. Instead, companies must consider m-Commerce as a highly personalized, easy-to-use, transaction-oriented, and location-specific service. **Furthermore, companies should continually update their m-Commerce platforms to leverage future 2.5G and 3G technologies.**

Technology drivers and implications for operators and Internet companies

Today, technology changes are increasingly governed by Metcalfe's law that states that the value of a network increases as the square of the number of users on the network. Metcalfe's law helps explain the proliferation of Internet content: Each user of the network contributes a squared value to the content providers as well as to the other users on the network. In Japan and Europe, we have already seen early signs of viral growth and the formation of communities in the new medium.

Given the short business cycles in today's mobile Internet environment, telecom operators and Internet companies need to move quickly to establish their brands. As with the wired Internet, early successful movers in the mobile Internet stand to garner the largest customer mindshare. Partnering with other companies to quickly fill the gaps in areas outside their expertise will be necessary for companies to strengthen their mobile Internet platforms and achieve market share.

Near-term growth prospects and gating factors

Many key factors indicate that the mobile Internet is well positioned for significant near-term growth. Primary indicators are the significant investments being made by both operators and venture capitalists. A 3G spectrum auction earlier this year in the UK raised £22.5 billion for the UK government. It is estimated that a single US national license to be auctioned in September could cost up to \$25 billion. Venture capitalists

and private investors also see the opportunity. According to Venture Source, venture capitalists invested over \$800 million in wireless companies in the first quarter alone.

However, other factors indicate the grim realities of today's mobile Internet. The mobile Internet must overcome significant hurdles to achieve mass market adoption. Today's mobile Internet users are faced with high prices, slow access speeds, limited mobile-ready content, and disparate global standards for Internet information access. Furthermore, there is no clear evidence that mobile phones and other devices will be accepted by the market as a channel for Internet access.

Company positioning: The battle is just beginning

Companies have seen the benefits captured by the early Internet pioneers like Yahoo! and AOL and they do not want to miss the opportunity this time around. Network operators and service providers, hardware and software infrastructure providers, and content providers and portals are fighting for positioning along the mobile value chain. While m-Commerce leaders have yet to emerge for the mobile platform, all companies are looking to share in the m-Commerce revenues.

The mobile Internet of today will likely develop along a similar path as the narrowband Internet evolution from 1994 to 1999. First, operators, service providers and hardware manufacturers are building the mobile Internet foundation by building out their base stations, reconfiguring their phones and devices, and adding fresh spectrum. Second, the software infrastructure and content companies are providing improved functionality and information access with new applications and operating systems. The last stage of the evolution will bring m-Commerce companies that will need the hardware and software infrastructure in place before commencing with monetary transactions.

The prices in this report are based on the market close of July 12, 2000.

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LL: Latin America Recommended List

TB: Trading Buy

MO: Market Outperformer

MP: Market Performer

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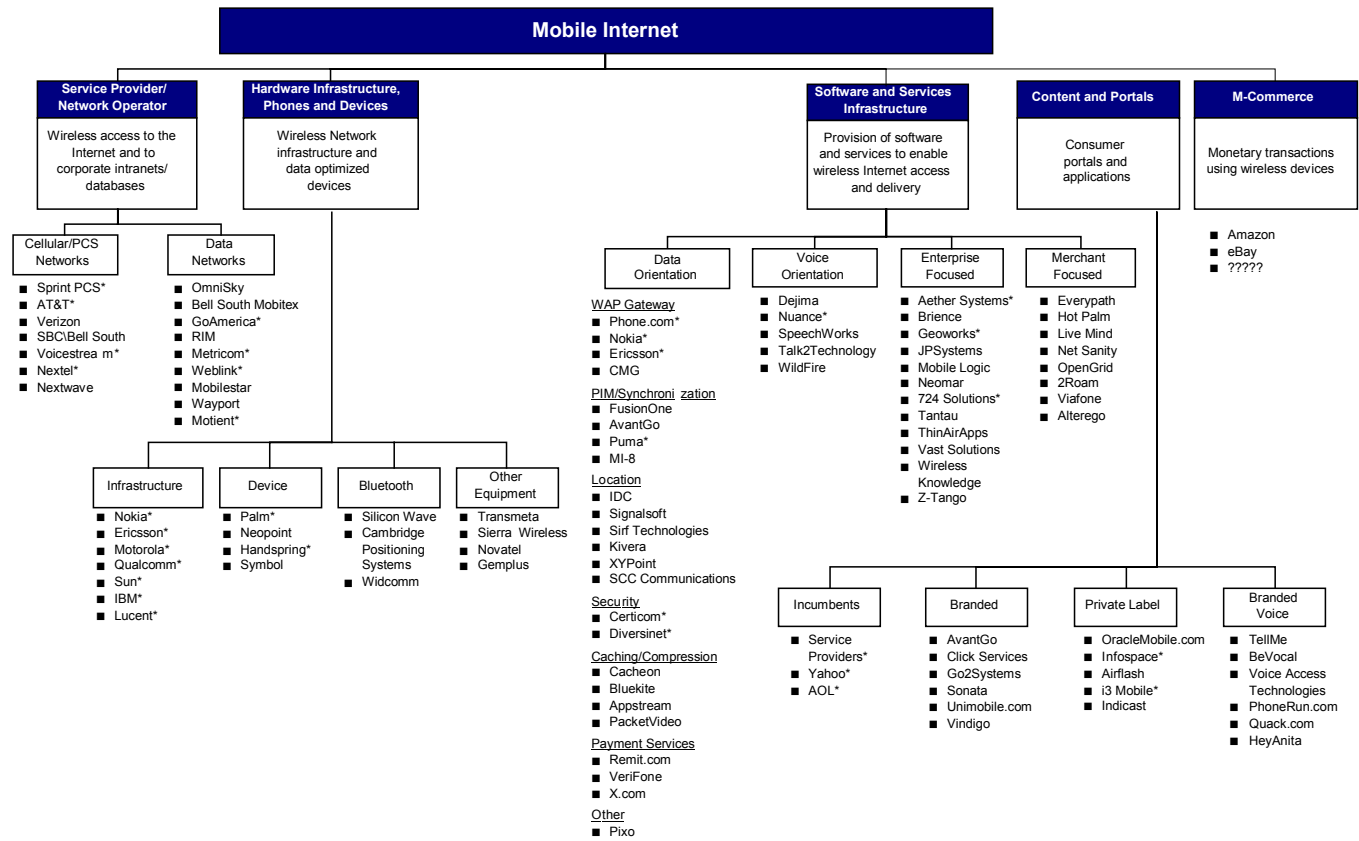
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The mobile Internet landscape



* Denotes public company

Source: GS Research.