MindAscent: Mobile and Wireless Technology Predictions

Wireless and mobile technologies are becoming commonplace. Applications will emerge to meet the needs of a more stable market, but will be slow to catch on. Integration and standards are the keys to fast adoption.

The foundation of wireless technology continues to stabilize, enabling the market to mount a broad expansion into front-line computing: that is, the segment of business that is most customer-facing and most mobile. New and compelling applications will emerge for consumers and enterprises. Devices have better screens and longer battery lives, while applications are more wireless-aware. Networks are maturing, with faster wireless data speeds and better interoperability, creating a seamless solution. Application design is improving; but developers are finding it difficult to understand which design models will spur usage. Enterprises are focusing on e-mail, but also deploying wireless LANs (WLANs) and special applications for departmental use.

Prediction: Devices Will Continue to Be Less Expensive and More Integrated

Device progress will not plateau in 2004. Terminal technology will continue to advance as manufacturing costs drop below $50 per unit. Integration of high-end capabilities will increase to the level that personal digital assistants (PDAs) enjoy. We expect functional convergence — application commonality across physical designs — and physical divergence to increase for PDAs and phones. Experimentation on device form factors has become so aggressive that some new devices have become difficult to use.

The most interesting category in 2004 will be smartphones. Not only are device manufacturers competing to supply the devices, but operating systems providers— one of which is Microsoft — are competing to dominate the software platform across the manufacturers. PDA vendors must react to the smartphone phenomenon by choosing either to migrate or extend to that form factor, or continue to offer a separate phone connected to the PDA via Bluetooth. Wireless e-mail is dominated by Research In Motion's (RIM) BlackBerry, especially in the North American market, but smartphones and new wireless PDAs may attract new buyers away from RIM. More powerful terminals will allow the use of instant messaging and wireless e-mail applications. These applications could overtake the business use of Short Message Service (SMS) because of their interoperability with Windows and other platforms outside the operator networks.

We expect one of the Chinese manufacturers to break into the top 10 list of terminal manufacturers, but Nokia will retain its lead because of its prowess in the distribution channel, its brand and its "workhorse" terminals (that is, straightforward designs that have appealed to large market segments). Operators will continue to support third-tier manufacturers through co-branding or to establish their own brand on the device more prominently. Terminals will continue to be closely aligned with, and locked into, each operator, giving users less flexibility to move terminals among operators.

Prediction: Wireless WAN Pricing and Interoperability Will Stabilize as the Technology Matures

Mobile data services covering basic wireless WAN transport have finally established a viable platform on which to build consumer and enterprise applications. The basic capability to deliver IP access over wide geographic areas covering more than 90 percent of the population is maturing, and prices and interoperability will stabilize during 2004. Only e-mail, picture messaging and SMS are sure to increase wireless data traffic, but operators are aggressively seeking other mass-market applications, with limited success.

Unified wireless messaging clients on handsets that offer e-mail, SMS, multimedia messaging service (MMS) and instant messaging will become more prevalent. Users may start to move away from SMS for business due to e-mail and Instant Messenger's greater interoperability properties.

W-CDMA and other advanced systems, like high-speed wireless, have struggled to become established based on their original justification for deployment — wireless data. Instead, they will be deployed in small pockets to improve voice capacity in high-density areas — a particular problem in Europe. Global networks will never again be upgraded all at once. Instead, areas with high demands for capacity will be upgraded. Higher-end handsets will be able to access different networks through multimode and multiband radios and thus will provide better performance. Lower-end handsets will be tied to a specific technology level and will experience less consistent network access quality — for example, dropped calls. As a result, operators may begin to charge users according to quality of service to recoup the costs of the advanced networks. Alternative uses of wide-area wireless, like fixed wireless, will continue to struggle, especially as a roadband substitute. Wireless broadband will emerge, but will face challenges in the most lucrative, high-density areas from incumbent wired vendors that are geared to hold onto territory through price reductions and aggressive marketing. Few are willing to invest in broadband substitutes when the market is weak outside those highly populated areas adequately covered by wire and while money to invest remains tight.

Wireless WANs will be complemented by Wireless Fidelity (Wi-Fi) "hot spots" using 802.11 b technology. The number of hot spots and devices capable of accessing them is growing. All major wireless service providers have partnered or deployed their own wireless LAN services already.

Network managers need to look at their network architectures more broadly as the options expand to include wireless WAN, WLAN and wireless personal-area networks. For enterprises, managing costs will become more complex. IT organizations will have to investigate integrators or managed service providers that can consolidate several communications options. As more networks accessible to individuals and enterprises emerge, the case for centralized management will become more compelling.

Integrated connectivity must be supplemented by integrating applications like voice over IP (VoIP) and security. As more access is granted through public networks, application security can no longer be based on the "walled garden" approach — where a user is granted privileges by being inside a security zone.

Software platforms from competing operating system providers — including Microsoft, Symbian and PalmSource — will remain fragmented, making development difficult. Microsoft will use its dominance of many enterprise environments to consolidate its business appeal. As a result, Microsoft will attract more well-known manufacturers, overcoming one of its earlier obstacles toward adoption. By contrast, the competitive environments will mostly tout Java as an alternative to Microsoft. They will succeed in consumer markets, where open-source technology will appeal. But because enterprises will value more controlled platforms, Java will struggle in the enterprise market. Other key technologies — XML, XHTML and VXML — have not yet developed far enough for use with wireless projects.

Prediction: Weak Standards Will Hamper Wireless Technology for Consumers

Consumer applications will operate faster because wide-area wireless voice and data systems will stabilize and network choices widen. Developers and operators are struggling to move away from formats that worked with PCs and find designs that accommodate multichannel approaches. A circuitous route to better designs is likely due to the obstinance of the operators regarding alternative approaches. In addition, many applications are closely linked to specific network operator technologies, preventing developers from targeting across multiple markets. Operators are not providing much leadership, so new approaches will develop slowly.

Lower prices for Bluetooth and 802.11 chips will enable them to be used in more consumer products. Manufacturers of domestic networking products are working toward creating wireless backbones to carry data, video and voice traffic by producing more wireless-enabled products. These remain experimental because the standards that could make them mature, high-volume products are still elusive. The intransigence of the Bluetooth Special Interest Group over interoperability certification to ensure that Bluetooth products are compatible will continue to confuse Bluetooth users, but it will not stop the deployment of the technology. Technology using the 802.15.4/ZigBee standard will help automate machines, but integral design will take years due to long product development cycle times.

Prediction: Corporate Mobile Applications Will Experience Slow Adoption, but Picture Messaging Will Spread Widely

Mobile applications range from low-level applications that provide a basic service on which to build higher functions, to those aimed at a broad range of users across the organization to the more typical, departmental functions, which have a highly targeted return on investment. Most of the applications due out in 2004 will come from small vendors. In the long term, some of these will fail, so buyers must be careful when purchasing applications. Larger application vendors, like Siebel and SAP, have active mobile endeavors but continue to use a design model that simplistically attempts to squeeze notebook functionality onto a small handheld. This model must surely be changed to drive any sort of adoption.

Popular applications for wireless data tend to be those where users are employing the device while standing or walking and where information is time-critical. Examples include sales, field service, government forms completion and inventory applications. Enterprise use of wireless e-mail will increase, fueled by the importance of e-mail as a crude workflow system. Location services will begin to emerge as a useful capability that is engaged in a long, slow rollout. Software-based “push to talk” services, which can be used to offer instant-messaging-style functions for voice messaging, will likely fail to achieve broad adoption due to poor performance.

MMS will be the big consumer application hit of 2004, with picture messaging following the success of SMS. The increasing number of camera phones will continue to boost growth. Success with MMS will encourage operators to expand into business applications. Operators will find success in business applications only in Asia/Pacific, where organizations rely more frequently on operators. Operators in other regions will flounder because sales and support staff are poorly trained and infrastructures cannot deliver the more costly, consistent service that enterprises demand. Operators will control the wireless relationship with enterprises, but their incompetence will cause frustration. It will be several years before operators cede control and go back to selling simple network services, offloading the enterprise support burden to those more experienced in such matters.

Prediction: Wireless LANs Will Become Integrated Into the Wired Network Infrastructure

The Institute of Electrical and Electronics Engineers (IEEE) will approve several pending standards, adding a broader set of interoperable wireless features. In particular, 802.11i will improve the security of WLANs. Enterprises that have so far relied on 802.11b will begin to move to 802.11a/g in 2H04, but 802.11a/g will not outship 802.11b for several years. Many products will offer 802.11g as a free component, but we do not recommend it for enterprise use. When 802.11b and 802.11g clients share common access, performance degrades. Instead, higher-bandwidth applications should move to 802.11a.

New switch architectures will affect wired switching, causing a move toward a universal switching model. Improvements in switches will usher in a period of innovation. Enterprises may be willing

to shun the safe haven of an all-Cisco environment and instead opt for alternative vendors with more innovative technology. Cisco will remain dominant, but will continue to be “middle of the pack” technologically and cost more than its rivals. WLAN switch startup vendors will struggle as incumbent wired vendors add equivalent technology faster than expected.

WLAN applications will start to extend beyond simple Ethernet connectivity. Vendors will first attempt to blend wireless VoIP into the WLAN infrastructure. Dedicated WLAN handsets tied to a specific vendor’s VoIP solution will continue to launch, as well as experimental units from mainstream wireless handset vendors. Yet adoption will be slow. VoIP technology suffers from both a lack of system interoperability standards and Wi-Fi-certified standards relating to quality of service needs. Handset sales are encumbered because each implementation is unique.

Bottom Line: Mobile and wireless technologies are essential in any enterprise planning scenario, both to address internal efficiencies and to increase customer satisfaction and revenue. Operators should see continued growth in wireless applications, although most revenue will come from simple applications like MMS for photography and messaging. It will remain difficult to justify building new networks because consumer usage patterns are too uncertain. To fuel innovation, operators must provide stability in their networks, choices based on standards and application services while simultaneously lessening control over how the market evolves. In the end, innovation in applications will justify greater investment in infrastructure and encourage enterprises to rely on the technology.