

THE CHANGING WIRELESS WORLD— WHAT YOU NEED TO KNOW

INTRODUCTION

For many businesspeople, the term “mobile computing” doesn’t just mean notebooks with the capabilities of desktop computers. Mobile computing has evolved beyond the laptop and is being adopted within industrial handheld computers. These devices pack the punch of a souped up notebook with the added advantage of being extremely rugged. In fact, “ruggedized” mobile computers are being installed by the thousands in harsh industrial environments such as retail sales floors, in trucks and on forklifts.

The ability to use technologies such as wireless e-mail, wireless data transfer, the Internet and global positioning systems in a rugged mobile computer is creating entirely new levels of interest in these devices. Wireless mobile computing solutions have been developed for specific industries such as beverage route sales, package and parcel pick up and utility dispatching.

Companies that are embracing wireless technological advancements in non-traditional areas are reaping benefits including improved customer service and reduced operating expenses. Being able to respond to customer requests instantly with real-time dispatching to the nearest service person dramatically improves a company’s level of service and image with its customers. Imagine being told that a service person will respond to your inquiry between 4 p.m. and 5 p.m. tomorrow – and the promise comes with a money back guarantee. And that’s what many cable TV companies are now doing with real-time dispatch systems.

Mobile computers also allow users real time access to critical data for management decisions, reduce travel time to and from jobs, eliminate redundant entering of paper-based data, and increase the number of jobs and functions performed during a single shift. Of course, all these improvements benefit a company’s bottom line. If done properly, an investment in mobile computers can be recovered in as little as five months.

This article examines some of the considerations and decisions to be made when making wireless and mobile computing purchasing decisions for non-traditional businesses.

APPLICATION SOFTWARE CONSIDERATIONS

Choosing software applications is the starting point for any mobile computing project. First, users must define what the software should do for their operation – what is its purpose? Then, it is critical to fully investigate the capabilities of the current enterprise setup and confirm that the operations the chosen application software needs to perform do indeed function properly within that system. The new application software certainly shouldn’t create more problems than it will solve.

The implications and potential effects of software functionality can be far reaching and should be taken into careful consideration before any purchases or installations. Some details to consider include:

- the enterprise platforms with which your users will interface
- the development environment under which your software will be created
- the size and operating power of your mobile computer
- the operating system that will run the software on your mobile computer
- the wireless communications hardware and software that will enable your software to communicate with headquarters
- the level of dependency the software will have on the network. Will it require much real-time interactivity with your system?
- the complexity in making your mobile system work with your enterprise. Don't underestimate the cost – both labor and financial – of integrating a mobile application.

In today's open systems environment, there is no need to commit to proprietary operating systems and application software programs. Many open development environments will work with industrial mobile computers. In addition, many companies offer base packages designed specifically for manufacturing, distribution and service industries. Find a vendor with credentialed experience in the areas to be automated. That vendor will help to determine whether their base program will work as is, or require some customization in order to fulfill the company's needs.

Both the functionality expected from a new software application and the hardware platform on which it runs (Palm, Linux, Windows CE or Pocket PC) will have an impact on mobile computer configurations. For example, if a Pentium processor is required to run the application, a mobile computer with sufficient memory will be needed to support that platform. Of course, this will affect the cost of the solution as well. Middleware also may be necessary to connect the application to the company's enterprise system. Again, understanding and choosing the right application is critical, not only so that it will perform the required tasks but also to manage the overall cost of going mobile. Cost projections should include the mobile computers, plus integration work, ongoing maintenance, etc.

WIRELESS COMMUNICATIONS TECHNOLOGIES

Significant technological advances continue to be made in the area of wireless communications. Wireless networks can be installed within the enterprise, known as wireless local area networks or WLANs) or outside the enterprise, known as wireless wide area networks or WWANs.

Wireless Local Area Network Technologies

Wireless LANs continue to increase in popularity, with market researcher IDC forecasting the worldwide WLAN semiconductor market to grow at an annualized rate of 13% to \$1.1 billion in 2007. Wireless LANs are commonly found in warehouses, on manufacturing floors as well as in corporate offices. Valued for their ability to mobilize workers and enable materials tracking, WLANs offer high-speed wireless data transfer practically anywhere within the enterprise, in real time and with no cost for the use of "airtime."

Potential purchasers of WLAN equipment face various considerations before making buying decisions, including the network coverage and data rates needed within their system as well as networking standards. Almost all mobile applications today lend themselves to deployment of an 802.11 standard WLAN infrastructure.

Many applications and devices support the 802.11b standard, which operates in the 2.4 GHz frequency range at an 11 Mbps data rate. Although 802.11b is much more widely implemented than the newer 802.11g and 802.11a technologies, it won't be long before these other technologies meet or exceed them in popularity. 802.11g offers a higher data rate connection than 802.11b but still operates in the same 2.4 GHz band. 802.11g equipment is fully backward compatible with 802.11b devices and therefore usually is a safe investment.

The 802.11a standard, which operates in the 5 GHz frequency range, has its advantages as well. The standard has eight channels at 54 Mbps, versus three with 802.11b or 802.11g. These extra channels make for easier site deployment of access points. However, the coverage that 802.11a offers is less than that of 802.11g and especially 802.11b.

Application and client devices determine the 802.11 requirements of the access point. To ensure maximum flexibility and investment protection, purchasers should choose access points that support multiple radio technologies simultaneously and that can interact with client devices using any of the 802.11 standards. Additionally, look for access points that can be upgraded as future standards are released.

Wide Area Wireless Technologies

WAN technology enables mobile workers to stay connected with the home office and with their customers outside the range of the company's Local Area Network – an important competitive advantage. Although most industries are seeing benefit from the technology, WAN applications that specifically address the field sales, route accounting and field service industries have experienced dramatic growth in the past five years.

In order to play in the wide area wireless market, mobile computer manufacturers must produce and offer devices that can communicate with wide area data carriers like AT&T Wireless, Sprint PCS, T-Mobile, and Verizon Wireless. In the United States, almost all major carriers now offer both voice and data transmission to network subscribers.

AT&T Wireless and T-Mobile use the Global System for Mobile Communications (GSM), which is very popular throughout the world. GSM is a switched service commonly used for voice and occasionally data, transmitted via modem device. General Packet Radio Service (GPRS) is a wireless packet data transmission technology that provides mobile data service with consistent throughput speeds of up to 30 Kbps. AT&T Wireless recently upped the ante by upgrading their network to EDGE, the next step in GSM data transmission technology, offering consistent data speeds of over 100 Kbps. EDGE is in its infancy, and most device providers will not be able to offer integrated EDGE until mid-2005.

Sprint's and Verizon's networks are based on Qualcomm's CDMA technology, which provides voice and data capabilities using IS95 and 1xRTT services 1x, as it is abbreviated, with consistent data speeds of over 50Kbps.

Verizon has embarked upon the next generation of 1xRTT called 1xEVDO, a technology that will increase data speeds over 300Kbps. This upgrade has just begun and will not be completed until the end of 2005. And in the not-so-distant future, wireless carriers will offer even faster and

more reliable data and voice transmission technologies -- such as Universal Mobile Telecommunications System (UMTS) -- that will far exceed the needs of most current mobile data applications.

THE MOBILE COMPUTER

As discussed earlier, both software and communication requirements will determine your mobile computers' configuration. However, when evaluating mobile computers, a number of details also must be considered. These include performance, weight, ease of use, battery life/power management, availability of peripherals (scanners, printers, docking system), ability/ease to upgrade, cost to upgrade, scalability and the existence of a touchscreen.

Companies operating in industrial and harsh commercial environments should consider implementing ruggedized mobile computers to lower the cost of owning mobile devices. Ruggedized mobile computers are designed and built specifically to operate under challenging conditions -- enduring particulates and liquids, exposure to extreme temperatures, drops to concrete and interference from other radios. Able to withstand these extremes on a daily basis, ruggedized computers last much longer, have lower failure rates and therefore have a much longer replacement cycle than commercial grade devices.

SYSTEMS INTEGRATION

When discussed in the context of a mobile computing system, integration can be divided into two areas. The first area is integration at the applications level. Consideration must be given to how the software application and the various hardware and peripherals selected will work together. Will the handheld computer work with the wireless modem? Can the software and radio network withstand the shock of the handheld computer shutting down to conserve battery power in the middle of a wireless data transfer? Will the user be able to switch from wireless data transfer to a dial-up modem connection without major headaches?

On a larger scale, when evaluating mobile computing needs it is essential that the solution implemented can communicate with the existing computer system or the system to which you are migrating. This is the challenge of systems integration at the enterprise level. For example, companies often must integrate a wireless handheld solution into complex and mission-critical enterprise resource planning systems such as SAP.

SUMMING UP

Once the need for a wireless and mobile computing solution has been determined, a return on investment (ROI) analysis is in order. An accurate/detailed ROI analysis will require a company to commit a certain level of dollars to the project. For example, in a warehouse scenario -- where significant savings can be captured with wireless technology -- a site survey must be performed to define the physical environment in which the system will need to operate.

As non-traditional areas of business explore the costs and benefits of implementing wireless technology, each of the areas discussed above -- applications software, wireless LAN and WAN communications options, mobile computers and the integration and interoperability of each of these components -- should be carefully weighed, with all the options considered before the investment is made.

Choosing the right vendors and implementation partners is key to getting the most out of your investment in wireless networking.