INTRODUCTION

The proliferation of intelligent devices, the Internet and mobile and wireless computing technologies are presenting new opportunities for organisations to seamlessly extend all of their electronic business information through the new Internet-based systems to anywhere where transactions occur.

The mobile and wireless computing provides a comprehensive technology platform to drive the markets for e-commerce solutions. Using these technologies, telecommuters, field salesman, remote offices and small businesses can access information remotely from desktops and laptops. These technologies also empower hand-held devices, already used for tracking personal appointments and contacts, to provide access to enterprise information. Intelligent appliances not only allow organisations to collect information remotely but also facilitate the automation of business management functions. Stock trading from mobile phones, distribution of ERP business processes, inventory management and price adjustments, are examples of how these technologies are enabling e-commerce anywhere.

WIRELESS INFORMATION ACCESS DEVICES

There is an explosion in the variety of wireless access equipment ranging from PDAs, mobile phones, modem-equipped hand-held and laptop computers.

IDC forecasts that Windows CE and palm-top will dominate the hand-held market in the future. Hand-held devices will grow dramatically in terms of the unit shipments and the significance as functional tools for enterprises in many areas of activity and commerce. The value of shipments of hand-held companions in Hong Kong and PRC, which includes PDAs, PC companions, and personal companions, are expected to increase from approximately US$9.3 million in 1997 to approximately US$385.6 million in 2004, representing a CAGR of 70.3% over the same period. IDC expects that the development of new software that enables the hand-held devices to be implemented as corporate enterprise tools and extends the mobile worker's environment will stimulate and drive the growth of the hand-held market.

TECHNOLOGICAL DEVELOPMENTS ENABLING CONVERGENCE OF THE INTERNET AND WIRELESS DEVICES

As the number of wireless hand-held devices designed to access the Internet increases, there is a serious need for faster and better wireless communications technologies. The emergence of high-speed wireless data access technologies and the wireless Internet access technologies have significantly improved the delivery of data from the Internet to wireless devices.

High Speed Wireless Data Access Technologies

GPRS refers to a high-speed packet data technology which provides extremely capable and flexible mobile communications. It will support, inter alia, the widely used Internet protocol. With GPRS, a user's connection to the Internet is always open, which means that mobile terminal device users such as mobile phones and modem-equipped PDAs will have the same network characteristics that are currently employed by private networks. Data will be able to be transmitted to PDAs, mobile phones and other wireless devices at rates of over 100 kbps, allowing all existing Internet applications to operate smoothly without even the need to dial up a separate ISP.

GPRS has a huge advantage from a software perspective. Today, wireless middleware is often required to allow slow speed mobile clients to work fast networks for applications such as e-mail, databases, groupware or Internet access. With GPRS, wireless middleware will often be unnecessary, and thus it should be easier to deploy wireless solutions than ever before.

Wireless Internet Access Technology

Apart from GPRS, the publication of the WAP has also significantly improved the delivery of data from the Internet to wireless devices. WAP is an open, global specification that empowers mobile users with wireless devices to easily access and interact with information and services instantly. WAP was designed to work within the constraints of hand-held wireless devices: a limited memory and CPU size, small, monochrome screens, low bandwidth, and erratic connection. WAP allows users access to Internet websites written in WML. WML websites minimise graphics and certain other functions, so as to accommodate the limited screen size and functionality of mobile devices.

By complying with WAP specifications, mobile phone manufacturers, network operators, content providers and application developers can provide Internet-based products and services that are interoperable. For end-users, WAP technology brings easy, secure access to relevant Internet/Intranet information and other services through mobile phones, pagers or other wireless devices.

Broadband channel is a high-speed, high capacity transmission channel with the ability to carry video, voice and data simultaneously. Multiple mobile device users can access data simultaneously. The WAP and GPRS have enabled the delivery of data from the Internet to mobile phones or other wireless devices in a cost-effective manner.

MOBILE AND WIRELESS COMPUTING-BASED BUSINESS APPLICATIONS

While constructing the right wireless infrastructure is a necessary enabler of the new environment, mobile and wireless computing will be truly realised only when application and computing services required for working while away from the office are provided over the mobile network. A number of vertical, niche applications of mobile computing are already available, including vehicle dispatch and routing, inventory and package tracking, and on-line transaction processing.

Portable PC and hand-held devices are increasingly important for an enterprise's field operations and remote operational data management. These devices are used for data sharing and operational functions such as sales force automation, sales inventory, pricing, order processing, parts inventory and service scheduling. In addition to operational and transactional functions, portable PC and hand-held devices with the integration to a central corporate database could be used to provide business intelligence such as customer profile information, customer history, geographic or seasonal market information, and other strategic information on a timely basis. The business intelligence achieved by applying the mobile and wireless computing technologies could greatly enhance the effectiveness of the enterprises. Moreover, with the integration to the enterprise's central service database, service history of a given customer or product could be accessed through portable PC and hand-held devices by the service professionals. If the service professional or field personnel demonstrates a solid understanding of the customer's problems and issues, a better customer relationship could be achieved.

In addition, there has been a trend to provide and receive enterprise information directly through mobile phones. Mobile phones are becoming ubiquitous and fairly simple to use. Also, it is now possible to access information on the Internet through mobile phones. WAP provides a uniform technology platform with consistent content formats for delivering the Internet and Intranet-based information and services to digital mobile phones and other wireless devices. WAP creates new business opportunities for enterprises by providing a new channel for existing services and the possibility of offering new services that can reach customers anywhere and anytime.

Mobile and wireless computing technologies make enterprise information more immediately accessible and useful.