

MOBILE COMPUTER DEVICES

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Mobile computer devices—including laptop computers, notebook computers, tablet computers, PDAs, smartphones, and portable data terminals—are now in the hands of hundreds of millions of people worldwide. The proliferation of mobile computer devices, and the number of places where they can be used, will increase the number of public library patrons who enter library facilities carrying a mobile computer device and who expect to be able to use it to access information.

While the most widely accepted term for a computer device that is both portable and wireless is a “mobile computer device;” the term “mobile” is sometimes limited to devices that can be used while moving, as opposed to portable computers, which are only practical for use while in a stationary position. In this TechNote, the broader meaning of “mobile” is used.

A cellular telephone is not a mobile computer device unless it includes a Web browser and has the capacity to download and manipulate files. When that is the case, the line between a cellular phone and a smart phone is blurred.

While mobility is the greatest advantage of mobile computer devices over desktop computers, there are some drawbacks:

- Most can only be used for a few hours before recharging
- The reliance on wireless networks means that they are less secure than desktop machines that use the electric grid and wired networks
- Screens are much smaller than those used with desktop computers
- The lack of full-size keyboards slows data entry

Before discussing the applications for mobile computer devices in libraries, it is necessary to describe the various types of such devices.

Types of Mobile Computer Devices

There are six major types of mobile computer devices: laptop computers, notebook computers, tablet computers, PDAs, smartphones, and portable data terminals. The first three are often called “portable” computers and the second three are often called “hand-held” computers. Each is briefly discussed in the following paragraphs.

Laptop Computers

Laptop computers, sometimes called “desktop replacement PCs,” offer desktop PC performance in a mobile environment. They have been widely available in North America since 2002. The typical laptop has a 14 to 17 inch screen; internal DVD-ROM or DVD-RW drive; large full-featured keyboard; integrated modem, network, Bluetooth, and Wi-Fi capabilities; high quality integrated audio and speaker system; three or more hours of batter life, low battery consumption; and the capability to be upgraded. Despite their power, they weigh only three to twelve pounds each. Many laptops have not only a built-in keyboard, but also a touchpad or pointing stick for input. A mouse can usually be attached. Despite these advantages of laptop computers, desktop PCs continue to be very popular because they are more durable and less costly to own over a period of several years..

Notebook Computers

Notebook computers are lightweight computers that have a very thin profile; 12 to 14-inch screen; no internal DVD or CD system, no internal floppy drive; limited graphics capabilities; integrated modem and network connection; small keyboard; low power consumption; and four or more hours of battery life. Upgradeability is usually limited. The

typical notebook computers weigh around 1.5 to three pounds. While sometimes not differentiated from a laptop computer, the former is larger, more powerful, and much closer to a desktop PC.

Tablet PCs

Tablet computers are slate-shaped mobile computers equipped with a touch screen or graphics tablet/screen hybrid. This allows the user to operate the computer with a stylus, digital pen, or fingertip, instead of a keyboard or a mouse. However, an external keyboard or mouse can be attached. The stylus also can be used to type on a pen-based key layout. Some tablet PCs also support voice recognition. The screen is usually small, often as little as eight inches. Tablets offer half the processor speed and memory of notebook computers, but the resolution is comparable and the weight is less than half that of notebook computers.

PDA's

While PDA's (Personal Digital Assistants) have been among the most popular type of hand-held mobile computer devices since 2000, initially they were primarily used for keeping track of schedules, maintaining directories of names and addresses, and accessing e-mail. Only since 2003 have processor speeds and memories increased to the point where it is practical to include a Web browser, cellular telephone, and fax capabilities. This eliminates the need to carry a separate cell phone. Cell phone manufacturers have responded with "smartphones," devices that include a Web browser.

Typical features of a PDA are a touch screen for entering data, a memory card slot for data storage, and Bluetooth and/or Wi-Fi support. Data entry is usually done using a virtual keyboard, where a keyboard is shown on the touch screen so that input can be done by tapping the letters with a fingernail or stylus. RIM's popular BlackBerry PDA has not only a touch screen, but a full keyboard and scroll wheels to facilitate data entry and navigation. The Palm

Treo is also a PDA.

The term “Pocket PC” is one given to PDAs that use the Microsoft Windows mobile operating system.

Smartphones

Smartphones are a compromise between a PDA and a cellular phone, with a focus on the cellular phone part. A smartphone allows a user to install programs, store information, and undertake e-mail; but Web access is limited. There are no industry standards for defining what is a smartphone, therefore, any mobile device that has more than basic cellphone capability may be offered for sale as a smartphone. Apple’s iPhone and Google’s 3G have so many features similar to those of PDA’s that some reviewers have classified them as PDA’s.

Portable data terminals

Portable data terminals are devices that can be used to enter or retrieve data via wireless transmission. Data entry can be done by keyboard or by reading of barcodes. Their major application has been inventorying. Portable data terminals frequently run wireless device management software that allows them to interact with a database or software application hosted on a server.

Wireless Technology

All of the foregoing devices can be manufactured with an “embedded” wireless networking chip; however, only since 2005 has it been common for manufacturers to include such chips. In fact, many manufacturers have now integrated 3-way wireless capability: Wi-Fi, Bluetooth, and GSM/GPRS. This makes them true mobile computer devices.

Recent estimates place the number of North American locations at which the users of mobile computer devices are able to access a wireless LAN at more than three million, including coffee shops, hotels, airports, college campuses, and libraries.

For information on wireless LANs, see PLA's TechNote on that subject.

Smartphones do not rely on IEEE 802.11 networks, but on ITU 2.5G and 3G networks. The ITU standard-based networks are wide area cellular telephone networks that have evolved to incorporate high-speed internet access and video telephony. IEEE 802.11 networks are short-range, high-bandwidth networks primarily developed for data.

Related Technologies

Two other mobile technologies which incorporate a computer are eBook readers and MP3 players. They are far more limited in the applications they support; therefore, they are not included in this TechNote.

The Applications

Increasingly, mobile computer devices offer a broad range of capabilities: database access, Web browsing, word processing, and e-mail. The reasons why a library patron might choose to use his/her mobile computer device rather than a desktop supplied by a library are:

- o No need to wait for a library desktop device to become available
- o Greater familiarity with the personally owned device
- o Ability to access information from anywhere in a library, including the stacks
- o Ability to download information and incorporate it into existing files
- o Speed and ease of taking the information away from a library

Accessing a library's patron access catalog, online reference services, and the Web are

not the only applications for mobile computer devices. For example, they can also be used for location independent reference assistance. Many libraries now offer virtual reference to users of mobile computers. Rather than coming to the reference desk, a user can interact with a reference librarian from within or without the library.

Given the proliferation of mobile computer devices, hundreds of libraries have installed wireless LANs in at least some areas of their facilities--generally in the reference areas. They report moderate use by patrons carrying laptop and notebook computers, but have not yet seen much of the other types of mobile computer devices. The notebook and laptop computers appear to be used for almost all of the same applications as desktop computers. One of the reasons PDA's and other small-screen mobile computer devices are less popular than laptop and notebook computers is that much online information is not formatted for small screens. It is also slower to retrieve and store large quantities of information. .

Many public libraries have not only installed wireless LANs to provide access from patrons' own mobile devices, but have also made library owned laptop or notebook computers available to patrons. The few that have made PDAs available, have found that the latest models appear to be too complex for patrons to use without instruction. Providing the instruction has been burdensome for library staff. However, smartphones that have an identifiable operating system are generally capable of a broader range of applications than those that do not. Among the more widely used operating systems are Symbian, Windows Mobile, Rim BlackBerry, iPhone OS, Linux, and Palm OS.

One portable data terminal application for libraries is as a backup circulation device; another is as an inventorying device. Potentially, they can be used for electronic shelf reading as they can interact with a database in real time using a wireless LAN.

Prepared September 26, 2008