

INTERACTIVE SESSION: TECHNOLOGY

NEW TO THE TOUCH

When Steve Jobs first demonstrated “the pinch”—the two-finger gesture for zooming in and out of photos and Web pages on the iPhone, he not only shook up the mobile phone industry—the entire digital world took notice. The Apple iPhone’s multitouch features dramatized new ways of using touch to interact with software and devices.

Touch interfaces are not new. People use them every day to get money from ATMs or to check into flights at airport kiosks. Academic and commercial researchers have been working on multitouch technology for years. What Apple did was to make multitouch more exciting and relevant, popularizing it just as it did in the 1980s with the mouse and the graphical user interface. (These had also been invented elsewhere.)

Multitouch interfaces are potentially more versatile than single-touch interfaces. They allow you to use one or more fingers to perform special gestures that manipulate lists or objects on a screen without moving a mouse, pressing buttons, turning scroll wheels, or striking keys. They take different actions depending on how many fingers they detect and which gestures a user performs. Multitouch gestures are easier to remember than commands because they are based on ingrained human movements that do not have to be learned, scientists say.

The iPhone’s Multi-Touch display and software lets you control everything using only your fingers. A panel underneath the display’s glass cover senses your touch using electrical fields. It then transmits that information to a LCD screen below it. Special software recognizes multiple simultaneous touch points, (as opposed to the single-touch screen, which recognizes only one touch point.) You can quickly move back and forth through a series of Web pages or photos by “swiping,” or placing three fingers on the screen and moving them rapidly sideways. By pinching the image, you can shrink or expand a photo.

Apple has made a concerted effort to provide multitouch features in all of its product categories, but many other consumer technology companies have adopted multitouch for some of their products. Synaptics, a leading supplier of touchpads for laptop makers who compete with Apple, has announced that it is incorporating several multitouch features into its touchpads.

Microsoft’s Windows 7 operating system sports multitouch features: When you pair Windows 7 with a touch-screen PC, you can browse online newspapers, flick through photo albums, and shuffle files and folders using nothing but your fingers. To zoom in on something on the screen of a multitouch-compatible PC, you would place two fingers on the screen and spread them apart. To right-click a file, touch it with one finger and tap the screen with a second.

A number of Microsoft Windows PCs have touch screens, with a few Windows laptops emulating some of the multitouch features of Apple computers and handhelds. Microsoft’s Surface computer runs on Windows 7 and lets its business customers use multitouch in a table-top display. Customers of hotels, casinos, and retail stores will be able to use multitouch finger gestures to move around digital objects such as photos, to play games, and to browse through product options. The Dell Latitude XT tablet PC uses multitouch, which is helpful to people who can’t grasp a mouse and want the functionality of a traditional PC. They can use a finger or a stylus instead. The Android operating system for smartphones has native support for multi-touch, and handsets such as the HTC Desire, Nexus One, and the Motorola Droid have this capability.

Hewlett-Packard (HP) now has laptops and desktops that use touch technology. Its TouchSmart computer lets you use two fingers at once to manipulate images on the screen or to make on-screen gestures designating specific commands without using cursors or scroll bars. To move an object, you touch it with a finger and drag it to its new location. Sliding your finger up and down or sideways smoothly scrolls the display.

The TouchSmart makes it possible for home users to engage in a new type of casual computing—putting on music while preparing dinner, quickly searching for directions before leaving the house, or leaving written, video, or audio memos for family members. Both consumers and businesses have found other uses as well. According to Alan Reed, HP’s vice president and general manager for Business Desktops, “There is untapped potential for touch technology in the business marketplace to engage users in a way that has never been done before.”

Chicago's O'Hare Airport integrated a group of TouchSmart PCs into "Explore Chicago" tourist kiosks, allowing visitors to check out a virtual Visitor's Center. TouchSmart computing helped an autistic student to speak to and communicate with others for the first time in the 14 years of his life. Without using the TouchSmart PC's wireless keyboard and mouse, users can hold video chats with remote workers through a built-in Webcam and microphone, access e-mail and the Internet, and manage contacts, calendar items, and photos.

Touch-enabled PCs could also appeal to elementary schools seeking an easy-to-use computer for students in early grades, or a wall-mountable information kiosk-type device for parents and visitors. Customers might use touch to place orders with a retailer, conduct virtual video service calls, or to teach or utilize social networking for business.

It's too early to know if the new multitouch interface will ever be as popular as the mouse-driven graphical user interface. Although putting ones fingers on the screen is the ultimate measure of "cool" in the cell phone market, a "killer application" for touch on the PC has not yet emerged. But it's already evident that touch has real advantages on devices where a mouse isn't possible or convenient to use, or the decades-old interface of menus and folders is too cumbersome.

Sources: Claire Cain Miller, "To Win Over Today's Users, Gadgets Have to be Touchable," *The New York Times*, September 1, 2010; Katherine Boehret, "Apple Adds Touches to Its Mac Desktops," *The Wall Street Journal*, August 4, 2010; Ashlee Vance, "Tech Industry Catches Its Breath," *The New York Times*, February 17, 2010; Kathy Sandler, "The Future of Touch," *The Wall Street Journal*, June 2, 2009; Suzanne Robitaille, "Multitouch to the Rescue?" Suite101.com, January 22, 2009; and Eric Lai, "HP Aims TouchSmart Desktop PC at Businesses," *Computerworld*, August 1, 2009.

CASE STUDY QUESTIONS

1. What problems does multitouch technology solve?
2. What are the advantages and disadvantages of a multitouch interface? How useful is it? Explain.
3. Describe three business applications that would benefit from a multitouch interface.
4. What management, organization, and technology issues must be addressed if you or your business was considering systems and computers with multitouch interfaces?

MIS IN ACTION

1. Describe what you would do differently on your PC if it had multitouch capabilities. How much difference would multitouch make in the way you use your computer?

DATA MANAGEMENT AND STORAGE

Enterprise database management software is responsible for organizing and managing the firm's data so that they can be efficiently accessed and used. Chapter 6 describes this software in detail. The leading database software providers are IBM (DB2), Oracle, Microsoft (SQL Server), and Sybase (Adaptive Server Enterprise), which supply more than 90 percent of the U.S. database software marketplace. MySQL is a Linux open source relational database product now owned by Oracle Corporation.

The physical data storage market is dominated by EMC Corporation for large-scale systems, and a small number of PC hard disk manufacturers led by Seagate, Maxtor, and Western Digital.

Digital information is estimated to be growing at 1.2 zettabytes a year. All the tweets, blogs, videos, e-mails, and Facebook postings as well as traditional corporate data add up in 2010 to several thousand Libraries of Congress (EMC Corporation, 2010).

With the amount of new digital information in the world growing so rapidly, the market for digital data storage devices has been growing at more than 15 percent annually over the last five years. In addition to traditional

disk arrays and tape libraries, large firms are turning to network-based storage technologies. **Storage area networks (SANs)** connect multiple storage devices on a separate high-speed network dedicated to storage. The SAN creates a large central pool of storage that can be rapidly accessed and shared by multiple servers.

NETWORKING/TELECOMMUNICATIONS PLATFORMS

U.S. firms spend \$100 billion a year on networking and telecommunications hardware and a huge \$700 billion on networking services (consisting mainly of telecommunications and telephone company charges for voice lines and Internet access; these are not included in this discussion). Chapter 7 is devoted to an in-depth description of the enterprise networking environment, including the Internet. Windows Server is predominantly used as a local area network operating system, followed by Linux and Unix. Large enterprise wide area networks primarily use some variant of Unix. Most local area networks, as well as wide area enterprise networks, use the TCP/IP protocol suite as a standard (see Chapter 7).

The leading networking hardware providers are Cisco, Alcatel-Lucent, Nortel, and Juniper Networks. Telecommunications platforms are typically provided by telecommunications/telephone services companies that offer voice and data connectivity, wide area networking, wireless services, and Internet access. Leading telecommunications service vendors include AT&T and Verizon (see the Chapter 3 opening case). This market is exploding with new providers of cellular wireless, high-speed Internet, and Internet telephone services.

INTERNET PLATFORMS

Internet platforms overlap with, and must relate to, the firm's general networking infrastructure and hardware and software platforms. U.S. firms spent an estimated \$40 billion annually on Internet-related infrastructure. These expenditures were for hardware, software, and management services to support a firm's Web site, including Web hosting services, routers, and cabling or wireless equipment. A **Web hosting service** maintains a large Web server, or series of servers, and provides fee-paying subscribers with space to maintain their Web sites.

The Internet revolution created a veritable explosion in server computers, with many firms collecting thousands of small servers to run their Internet operations. Since then there has been a steady push toward server consolidation, reducing the number of server computers by increasing the size and power of each. The Internet hardware server market has become increasingly concentrated in the hands of IBM, Dell, and HP/Compaq, as prices have fallen dramatically.

The major Web software application development tools and suites are supplied by Microsoft (Microsoft Expression Web, SharePoint Designer, and the Microsoft .NET family of development tools); Oracle-Sun (Sun's Java is the most widely used tool for developing interactive Web applications on both the server and client sides); and a host of independent software developers, including Adobe (Flash and text tools like Acrobat), and Real Media (media software). Chapter 7 describes the components of the firm's Internet platform in greater detail.