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Touch Language for Windows 8

Because the main thrust of Windows 8 is to optimize Windows for touch-screen devices, the Windows developers needed to agree on a set of touch interactions they would use when programming Windows 8.

If you're using Windows 8 on a touch-screen device, you may want to learn the gestures shown in Figure 5.21.

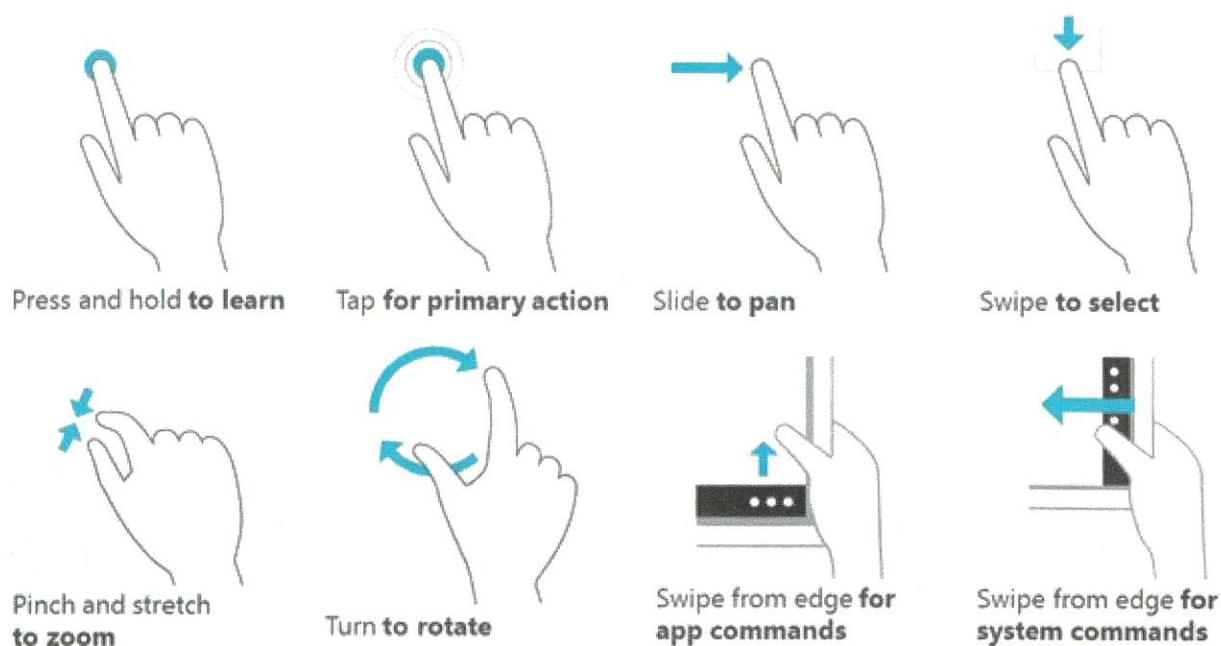


FIGURE 5.21 Windows 8 Touch Gestures

still leaving the other app you had running visible, with each one taking up half the screen. You can resize the apps as necessary to allow one to take up more screen space than the other. Depending on your screen resolution, you may be able to display up to four apps at the same time using snap.

How do I close a Windows 8 app? When Windows 8 apps aren't displayed on the screen, Windows will suspend them temporarily so they don't use much memory or power. Therefore, theoretically, you don't ever need to shut down Windows 8 apps. However, most people prefer not to have endless apps running, and it may be inconvenient to scroll through a huge list of running apps to find the one you want. To close a Windows 8 app from within the app, press

Alt+F4. Alternatively, you can move your cursor to the top of the screen until the title bar displays, then click the close button (X). Right-clicking on a thumbnail of the app on the switch list also allows you to close an app, as does swiping from the top of the screen to the bottom with your finger.

How does the Mac user interface compare with Windows 8? Although the OS X and the Windows operating systems aren't compatible, they're extremely similar in terms of functionality. For example, as is the case with Windows, OS X programs appear in resizable windows and use menus and icons. However, instead of the Start screen, OS X features a Dock with icons on the bottom for your



FIGURE 5.22 OS X Yosemite continues Apple's goal of making a seamless OS experience no matter what device you are using. (*Apple, Inc.*)

most popular programs (see Figure 5.22). Yosemite, the latest version of OS X, features tight integration between OS X and portable devices running iOS 8. Apple wants to make transferring data and tasks from one device to another seamless.

Is a Linux user interface similar to OS X and Windows? Different distros of Linux feature different user interfaces. But most of them, like Ubuntu (see Figure 5.23), are based on familiar Windows and OS X paradigms, such as using icons to launch programs and having apps run in a window environment. ■

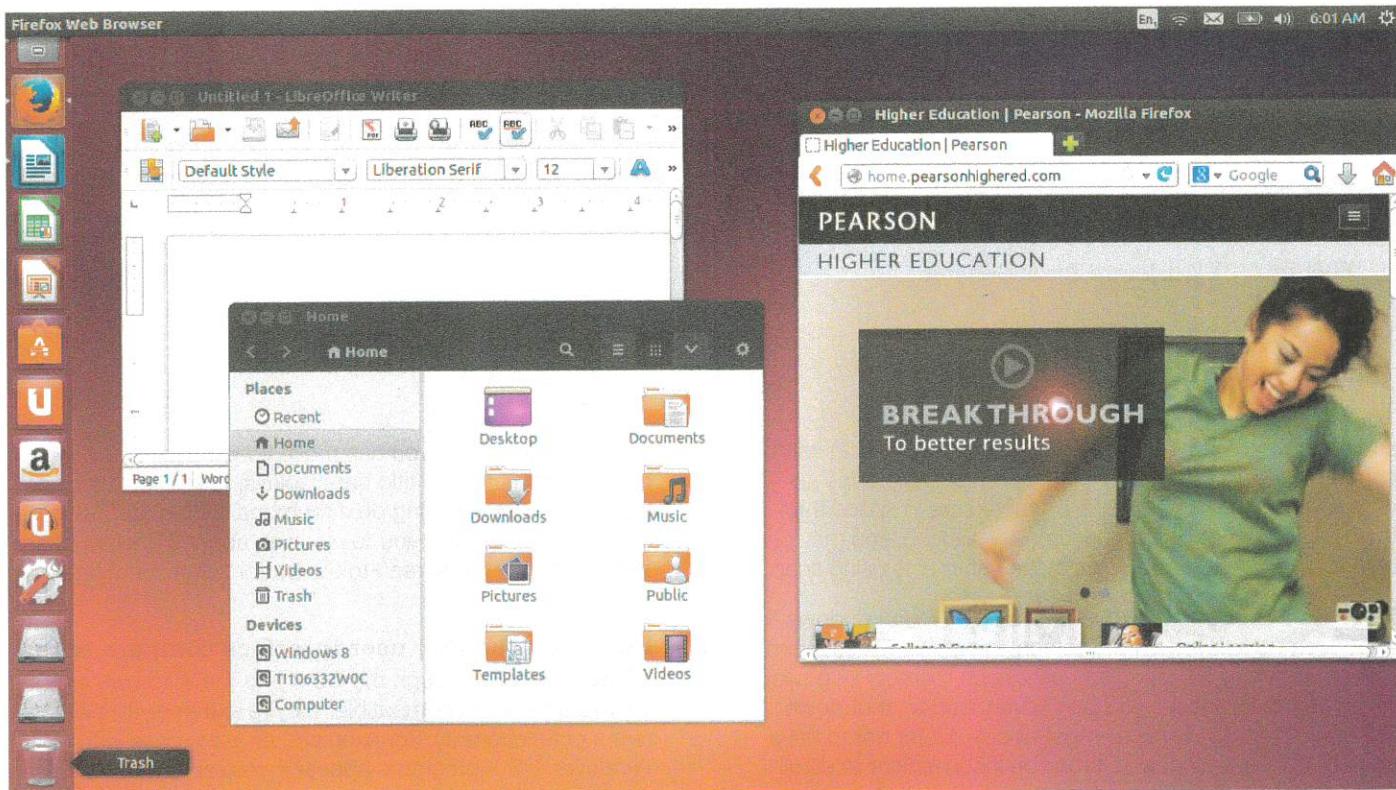


FIGURE 5.23 The Ubuntu Linux user interface resembles the Windows desktop. (*Mozilla, Firefox*)

trends in IT

Open Source Software: Why Isn't Everyone Using Linux?

Proprietary software such as Microsoft Windows and Apple's OS X is developed by corporations and sold for profit. This means that the **source code**, the actual lines of instructional code that make the program work, is not accessible to the general public. Without being able to access the source code, it's difficult for a user to modify the software or see exactly how the program author constructed various parts of the OS.

Restricting access to the source code protects companies from having their programming ideas stolen, and it prevents customers from using modified versions of the software. However, in the late 1980s, computer specialists became concerned that large software companies (such as Microsoft) were

controlling a large portion of market share and driving out competitors. They also felt that proprietary software was too expensive and contained too many bugs (errors).

These people felt that software should be developed without a profit motive and distributed with its source code free for all to see. The theory was that if many computer specialists examined, improved, and changed the source code, a more full-featured, bug-free product would result. Hence, the open source movement was born.

So, if an OS such as Linux is free and relatively bug-free, why does Windows, which users must

pay for, have such a huge market share? One reason is that corporations and individuals have grown accustomed to one thing that proprietary software makers can provide: technical support. It's almost impossible to provide technical support for open source software because anyone can freely modify it; thus, there is no specific developer

to take responsibility for technical support. Similarly, corporations have been reluctant to install open source software extensively because of the cost of the internal staff of programmers that must support it.

Companies such as Red Hat, Ubuntu, and Xandros have been combating this problem. Red Hat offers a free,

open source OS called Fedora (see Figure 5.24). In addition, Red Hat has modified the original Linux source code and markets a version, Red Hat Enterprise Linux, as a proprietary program. Fedora is the testing ground for what eventually goes into this proprietary program. Red Hat Enterprise Linux comes in versions for servers and desktops. Purchasers of Red Hat Enterprise Linux receive a warranty and technical support. Packaging open source software in this manner has made its use much more attractive to businesses. As a result, many web servers are hosted on computers running Linux.

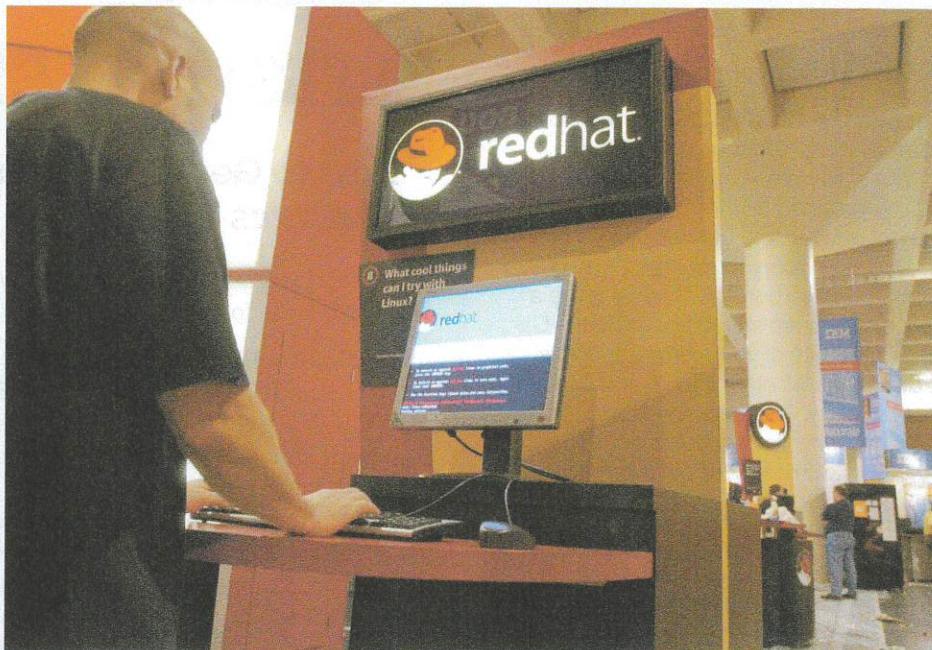


FIGURE 5.24 Companies like Red Hat provide free or low-cost Linux software, such as Fedora, but technical support is often not available (or not free). (Paul Sakuma/AP Images)



organizing your computer: FILE MANAGEMENT

So far we've discussed how the OS manages the processor, memory, storage, and devices, and how it provides a way for applications and users to interact with the computer. An additional function of the OS is to enable **file management**, which provides an organizational structure to your computer's contents. In this section, we discuss how you can use this organizational structure to make your computer more organized and efficient.

Organizing Your Files

How does the OS organize files? Windows organizes the contents of your computer in a hierarchical **directory** structure composed of **drives**, **libraries**, **folders**, **subfolders**, and **files**. The hard drive, represented as the C: drive, is where you permanently store most of your files. Each additional storage drive (optical drive, flash drive, or external hard drive) is given a unique letter (D, E, F, and so on). The C: drive is like a large filing cabinet in which all files are stored. As such, the C: drive is the top of the filing structure of your computer and is referred to as the **root directory**. All other folders and files are organized within the root directory. There are areas in the root directory that the OS has filled with files and folders holding special OS files. The programs within these files help run the computer and generally shouldn't be accessed.

What exactly are files and folders? In an OS, a **file** is a collection of program instructions or data that is stored and treated as a single unit. Files can be generated from an application such as a Word document or an Excel workbook. In addition, files can represent an entire application, a web page, a set of sounds, or an image. Files can be stored on the hard drive, a flash drive, online, or on any other permanent storage medium. As the number of files you save increases, it becomes more important to keep them organized in folders and libraries. A **folder** is a collection of files.

How does the library work? In Windows, a **library** gathers categories of files from different locations and displays them as if they were all saved in a single folder, regardless of where they are physically stored. For example, you might have pictures stored all over your computer, including your external hard drive. Rather than looking through each separate location to view your pictures, you can access all of them more easily by looking in the Pictures library. There are four default libraries: Documents, Music, Pictures, and Videos.

How can I easily locate and see the contents of my computer? In Windows, **File Explorer** (previously called Windows Explorer) is the main tool for finding, viewing, and managing the contents of your computer. It shows the location and contents of every drive, folder, and file. As illustrated in Figure 5.25, File Explorer is divided into two panes, or sections:

1. The *navigation pane* on the left shows the contents of your computer. It displays commonly accessed areas, organized by Favorites and Libraries (Documents, Music, Pictures, and Videos).
2. When you select a Favorite, Library, drive, or Homegroup, the files and folders of that particular area are displayed in the *details pane* on the right.

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How to Get the Most from Windows Libraries

To get the most out of using Windows libraries, consider the following tips:

- **Display libraries:** In Windows 8.1, Libraries are not displayed by default in File Explorer. To display Libraries, right-click on a blank space in the Navigation Pane and select *Show libraries* from the shortcut menu.
- **Add a new library:** To add a new library (such as one for your games), open File Explorer. In the Navigation Pane on the left side of the window, right-click on Libraries, click New, and then click Library. Type in a name for the new library. To add new locations to the library, open the new library, and click on Include a Folder.
- **Share or collaborate with libraries:** Say you have pictures saved on your laptop, your dad's desktop, and your mom's laptop. As long as all three computers are on the same Homegroup network, you can share each other's libraries by right-clicking the library name, pointing to Share With, and then clicking one of the two Homegroup options, depending on whether you want to allow editing privileges to those with whom you're sharing the library.
- **Create a backup library:** Do you store important data in a variety of folders on your computer? Even though it's best to back up your entire system, you might only need to back up specific folders. In that case, create a new library and call it "Backup." Add the folders you want to ensure are backed up to the library, and then point your backup software to that library.

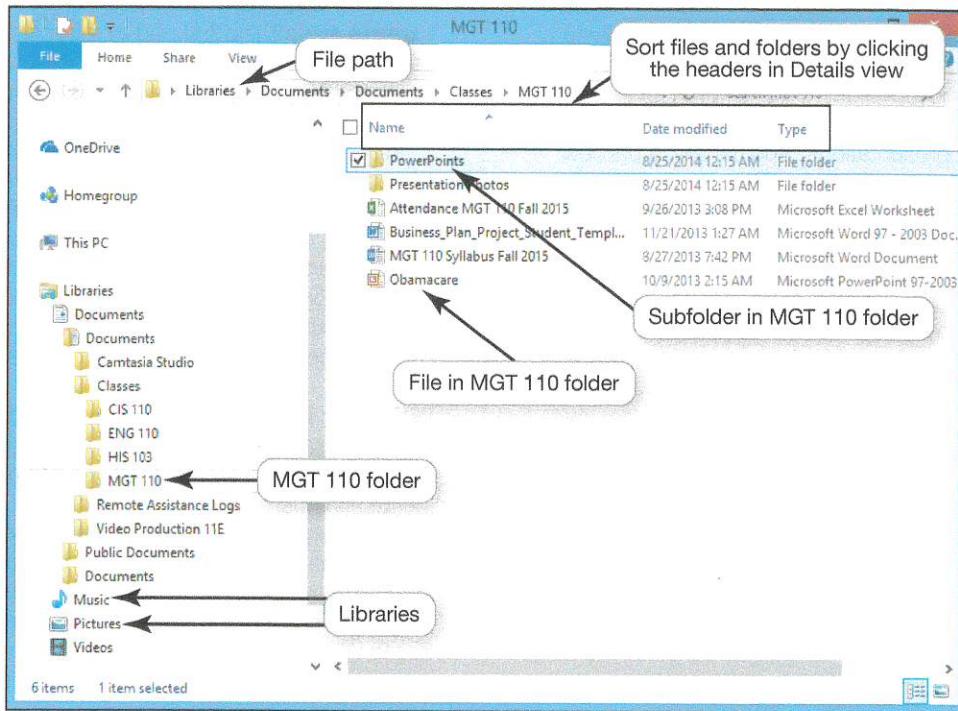


FIGURE 5.25 File Explorer lets you see the contents of your computer.
> Right-click on the Start button to display the menu, and then select **File Explorer**.

What are some tips on how best to organize my files? Creating folders is the key to organizing files because folders keep related documents together. For example, you might create one folder called “Classes” to hold your class work. Inside the “Classes” folder, you could create subfolders for each of your classes (such as ENG 110 and MGT 110). Inside each of those subfolders, you could create further subfolders for each class’s assignments, homework, and so on.

Grouping related files into folders makes it easier for you to identify and find files. Which would be easier—going to the MGT 110 folder to find a file or searching through the hundreds of individual files in the Documents library hoping to find the right one? Grouping files in a folder also allows you to



SOUND BYTE File Management

In this Sound Byte, you’ll examine the features of file management and maintenance. You’ll learn the various methods of creating folders, how to turn a group of unorganized files into an organized system of folders with related files, and how to maintain your file system.

move files more efficiently, so you can quickly transfer critical files needing frequent backup, for instance.

Viewing and Sorting Files and Folders

Are there different ways I can view and sort my files and folders? When you open any folder in File Explorer, the ribbon at the top displays a View tab. Clicking on the View tab offers you different ways to view the folders and files. In some views, the folders are displayed as *Live Icons*. Live Icons allows you to preview the actual contents of a specific file or folder without actually opening the file. Live Icons can be displayed in a variety of views. Here are the two most useful views for students:

1. Details view: This is the most interactive view. As shown in Figure 5.25, files and folders are displayed in list form, and the additional file information is displayed in columns alongside the name of the file. You can sort and display the contents of the folder by any of the column headings, so you can sort the contents alphabetically by name or type, or hierarchically by date last modified or file size. Right-click the column heading area to modify the display of columns.

2. Large Icons view: As shown in Figure 5.26, Large Icons view shows the contents of folders as small images. Large Icons view is the best view to use if your folder contains picture files because you can see a few images peeking out of the folder. It's also good to use if your folder contains PowerPoint presentations because the title slide of the presentation will display, making it easier for you to distinguish among presentations. Additionally, a preview pane is available in this view. The preview pane lets you view the first page of the selected document without having to open it.

What's the best way to search for a file? In Windows 8, the Search app is the best way to search for files and the contents of folders. The Search app searches through your hard drive or other storage devices (DVD or flash drive) to locate files and folders that match the criteria you provide. Your search can be based on part of the name of the file or folder or just a word or phrase in it. You can also search for a file type by representing the file name as an asterisk (called a wildcard character) and typing the file extension (such as “*.xlsx” to search for Excel files). You access the Search app from the Charms bar or from File Explorer. OS X has a similar feature called Spotlight. Make sure to change the search option from Everywhere to Files (at the top of the Search panel) or you'll also see a list of web pages that match your search term.

Naming Files

Are there special rules I have to follow when I name files?

The first part of a file, or the **file name**, is generally the name you assign to the file when you save it. For example, “bioreport” may be the name you assign a report you have completed for a biology class.

In a Windows application, an **extension**, or **file type**, follows the file name and a period or dot (.). Like a last name, this extension identifies what kind of family of files the file belongs to, or which application should be used to read the file. For example, if “bioreport” is a spreadsheet created in Microsoft Excel 2013, it has an .xlsx extension, and its name is “bioreport.xlsx.” Figure 5.27 lists some common file extensions and the types of documents they indicate.

Why is it important to know the file extension?

When you save a file created in most applications running under the Windows OS, you don't need to add the extension to the file name; it is added automatically for you. Mac and Linux operating systems don't require file extensions. This is because the information as to the type of application the computer should use to open the file is stored inside the file itself. However, if you're using the Mac or Linux OS and will be sending files to Windows users, you should add an extension to your file name so that Windows can more easily open your files.

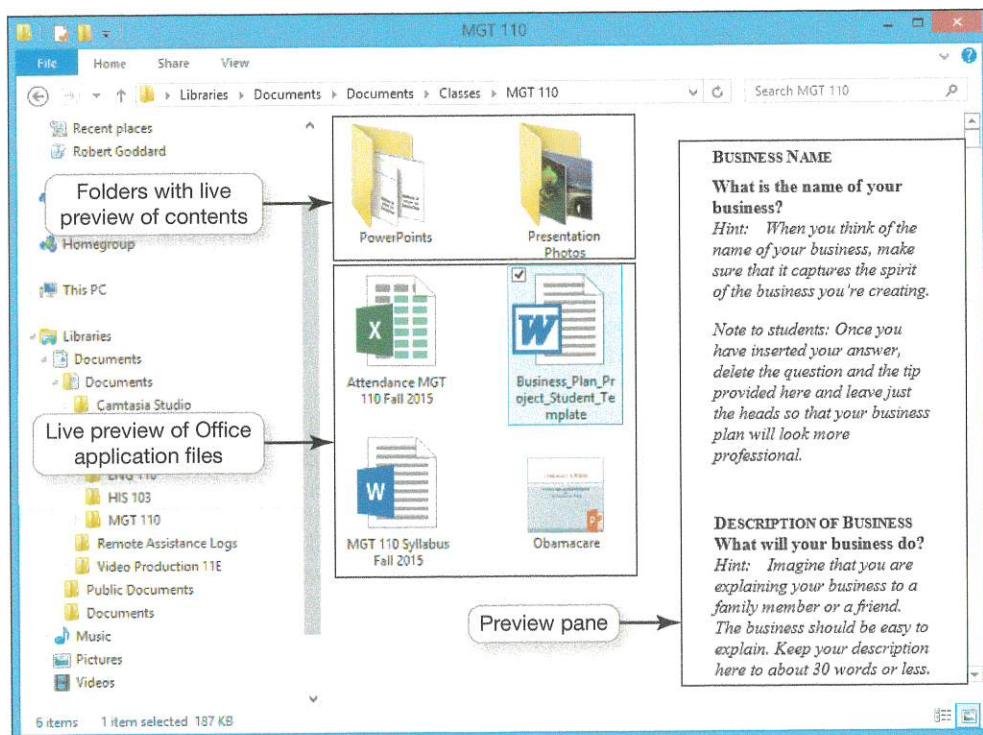


FIGURE 5.26 The Large Icons view is a good way to display the contents of files and folders. The Preview pane on the right lets you see the first page of your document without first opening it.

> To access Large Icons view, click the **View** tab from the ribbon in File Explorer, and then select **Large Icons** view. To access the Preview pane, click that icon on the View tab of the ribbon.

FIGURE 5.27

| EXTENSION | TYPE OF DOCUMENT | APPLICATION |
|---------------|---|--|
| .docx | Word processing document | Microsoft Word 2007 and later |
| .xlsx | Workbook | Microsoft Excel 2007 and later |
| .accdb | Database | Microsoft Access 2007 and later |
| .pptx | Presentation | Microsoft PowerPoint 2007 and later |
| .pdf | Portable Document Format | Adobe Acrobat or Adobe Reader |
| .rtf | Text (Rich Text Format) | Any program that can read text documents |
| .txt | Text | Any program that can read text documents |
| .htm or .html | HyperText Markup Language (HTML) for a web page | Any program that can read HTML |
| .jpg | Joint Photographic Experts Group (JPEG) image | Most programs capable of displaying images |
| .zip | Compressed file | Various file compression programs |

Have you ever been sent a file by e-mail and couldn't open it? Most likely, that was because your computer didn't have the program needed to open the file. Sometimes, similar programs that you already have installed can be used to open the file, so it's helpful to know what the file extension is. Sites such as FILEExt (fileext.com) can help you identify the source program.

Are there things I shouldn't do when naming my files? Each OS has its own naming conventions, or rules, which are listed in Figure 5.28. Beyond those conventions, it's important that you name your files so that you can easily identify them. File names can have as many as 255 characters, so don't be afraid to use as many characters as you need. A file name such as "BIO 101 Research Paper First Draft.docx" makes it very clear what that file contains.

Keep in mind, however, that all files must be uniquely identified, unless you save them in different folders or in different locations. Therefore, although files may share the same file name (such as "bioreport.docx" or "bioreport.xlsx") or share the same extension ("bioreport.xlsx" or "budget.xlsx"), no two

files stored in the same folder can share *both* the same file name and the same extension.

How can I tell where my files are saved? When you save a file for the first time, you give the file a name and designate where you want to save it. For easy reference, the OS includes libraries where files are saved unless you specify otherwise. In Windows, the default libraries are Documents for files, Music for audio files, Pictures for graphics files, and Videos for video files.

You can determine the location of a file by its **file path**. The file path starts with the drive in which the file is located and includes all folders, subfolders (if any), the file name, and the extension. For example, if you were saving a picture of Andrew Carnegie for a term paper for a U.S. History course, the file path might be C:\Documents\HIS182\Term Paper\Illustrations\ACarnegie.jpg.

As shown in Figure 5.29, "C:" is the drive on which the file is stored (in this case, the hard drive), and "Documents" is the file's primary folder. "HIS182," "Term Paper," and "Illustrations" are successive subfolders within the "Documents" main folder. Last comes the file name, "ACarnegie," separated from the file extension (in this case, ".jpg") by a period. The backslash characters (\), used by Windows, are referred to as **path separators**. OS X files use a colon (:), whereas UNIX and Linux files use the forward slash (/) as the path separator.

FIGURE 5.28

| | OS X | WINDOWS |
|------------------------------------|----------------------------|---------------------------|
| File and folder name length | As many as 255 characters* | As many as 255 characters |
| Case sensitive? | Yes | No |
| Forbidden characters | Colon (:) | " / \ * ? <> : |
| File extensions needed? | No | Yes |

*Note: Although OS X supports file names with as many as 255 characters, many applications running on OS X still support only file names with a maximum of 31 characters.



ACTIVE HELPDESK Organizing Your Computer: File Management

In this Active Helpdesk, you'll play the role of a helpdesk staffer, fielding questions about the desktop, window features, and how the OS helps keep the computer organized.



FIGURE 5.29 Understanding File Paths

Working with Files

How can I move and copy files? Once you've located your file with File Explorer, you can perform many other file-management actions such as opening, copying, moving, renaming, and deleting files. You open a file by double-clicking the file from its storage location. You can copy a file to another location using the Copy command. To move a file from one location to another, use the Cut command. You can access both of these commands easily by right-clicking on a file's name, which displays a shortcut menu.

Where do deleted files go? The **Recycle Bin** is a folder on the desktop, represented by an icon that looks like a recycling bin, where files deleted from the hard drive reside until you permanently purge them from your system. Unfortunately, files deleted from other drives don't go to the Recycle Bin but are deleted from the system immediately. In addition, files stored in the cloud are not cycled through the Recycle Bin. When you delete a file from a thumb drive or a network drive, consider it gone forever!

Mac systems have something similar to the Recycle Bin, called Trash, which is represented by a wastebasket icon. To

delete files on a Mac, drag the files to the Trash icon.

How do I permanently delete files from my system? Files placed in the Recycle Bin or the Trash remain in the system until they're permanently deleted. To delete files from the Recycle Bin permanently, select Empty Recycle Bin after right-clicking the desktop icon. On Macs, select Empty Trash from the Finder menu in OS X.

What happens if I need to recover a deleted file?

Getting a file back after the Trash has been emptied still may be possible using one of two methods:

- File History is a Windows 8 utility that automatically backs up files (see page 196 for a further explanation of File History) and saves previous versions of files to a designated drive (such as an external hard drive). If you're using File History, you can restore previously deleted files or even previous versions of files you've changed.
 - When the Trash is emptied, only the reference to the file is deleted permanently, so the OS has no easy way to find the file. The file data actually remains on the hard drive until it's written over by another file. You may be able to use a program such as FarStone's RestoreIT or Norton Online Backup to try to retrieve files you think you've permanently deleted. These programs reveal files that are still intact on the hard drive and help you recover them.
- This is how they do it on CS! ■

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Save Files in the Cloud Right from Your Apps

When you sign up for a Windows account, you automatically get free storage on OneDrive, Microsoft's cloud storage site. Taking advantage of this free storage space helps ensure that you have files available to you whenever you need them and have access to the Internet.

Fortunately, it's easy to save files to OneDrive in Windows 8. When you use the Save As command in an application, OneDrive shows up as a location (see Figure 5.30) to which you can save files (assuming you're connected to the Internet). So instead of saving your research paper to the Documents folder on your C: drive, save it to a folder called Documents on OneDrive. Initially there won't be any folders in your OneDrive account, but just create any that you need. Using OneDrive will ensure the availability of your files when you need them.

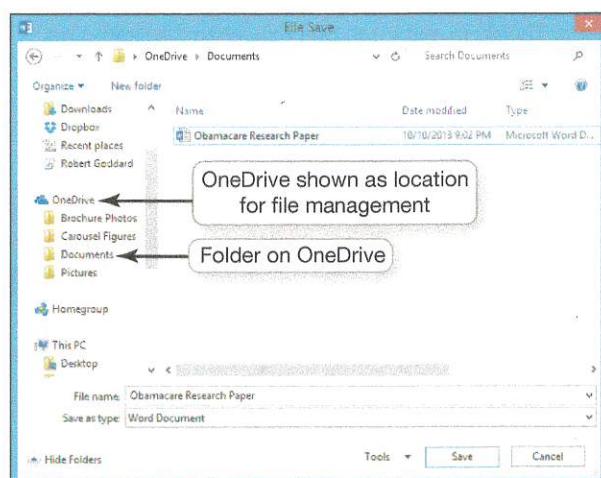


FIGURE 5.30 OneDrive appears as a location in which you can create folders and save files.



utility PROGRAMS

The main component of system software is the OS. However, *utility programs*—small applications that perform special functions on the computer—are also an essential part of system software. Utility programs come in three flavors:

1. Those that are included with the OS (such as System Restore)
2. Those sold as stand-alone programs (such as Norton antivirus)
3. Those offered as freeware (such as anti-malware software like Ad-Aware from Lavasoft)

Figure 5.31 lists some of the various types of utility programs available within the Windows OS as well as some alternatives available as stand-alone programs. In general, the basic utilities designed to manage and tune your computer hardware are incorporated into the OS. The stand-alone utility programs typically offer more features or an easier user interface for backup, security, diagnostic, or recovery functions. For some Windows programs, like Task Manager and Resource Monitor, no good stand-alone alternatives exist.

Display Utilities

How can I change the appearance of my Start screen and desktop? You can personalize the Start screen and the lock screen (the screen that forces you to enter a password to resume using your computer) to suit your tastes.

To do so, display the Charms bar, select Settings, and then choose Personalize. This provides you with access to personalization options such as changing pictures, colors, and backgrounds. This also provides you with access to the features you need to change the appearance of your desktop if you access the Charms bar from that screen.

The Programs and Features Utility

What's the correct way to add new programs to my system? When you download Windows 8 apps from the Windows Store, they automatically install on your computer. If you install non-Windows 8 programs, the program usually automatically runs a *wizard* that walks you through the installation process. If a wizard doesn't start automatically, open the Control Panel, click Programs, then click Programs and Features. This prompts the OS to look for the setup program of the new software, and it starts the installation wizard.



ACTIVE HELPDESK

Using Utility Programs

In this Active Helpdesk, you'll play the role of a helpdesk staffer, fielding questions about the utility programs included in system software and what these programs do.

FIGURE 5.31

Utility Programs Available Within Windows and as Stand-Alone Programs

| WINDOWS UTILITY PROGRAM | STAND-ALONE ALTERNATIVES | WHAT IT DOES |
|-----------------------------------|---|--|
| File Explorer File Compression | WinZip, StuffIt | Reduces file size |
| Disk Cleanup | McAfee Total Protection | Removes unnecessary files from your hard drive |
| Error-Checking | SeaTools (free download from seagate.com) | Checks your hard drive for unnecessary or damaged files |
| Task Manager and Resource Monitor | None | Displays performance measures for processes; provides information on programs and processes running on your computer |
| Disk Defragmenter | Norton Utilities, iDefrag | Rearranges files on your hard drive to allow for faster access of files |
| System Restore | FarStone RestoreIT, Acronis True Image | Restores your system to a previous, stable state |
| File History, File Recovery | Acronis True Image, Norton Online Backup | Backs up important files, makes a complete mirror image of your current computer setup |

In this section, we explore many of the utility programs you'll find installed on a Windows 8 OS. Unless otherwise noted, you can find Windows utilities in the Control Panel. We'll discuss antivirus and personal firewall utility programs in Chapter 9.

File Compression Utilities

Why would I want to use a file compression utility? File compression makes a large file more compact, making it easier and faster for you to send large attachments by e-mail, upload them to the web, or save them onto a disc. As shown in Figure 5.32, Windows has a built-in **file compression utility** that takes out redundancies in a file (zips it) to reduce the file size. You can also obtain several stand-alone freeware and shareware programs, such as WinZip (for Windows) and StuffIt (for Windows or Mac), to compress your files.

How does file compression work? Most compression programs look for repeated patterns of letters and replace these patterns with a shorter placeholder. The repeated patterns and the associated placeholder are cataloged and stored temporarily in a separate file called the *dictionary*. For example,

in the following sentence, you can easily see the repeated patterns of letters.

The rain in Spain falls mainly on the plain.

Although this example contains obvious repeated patterns (*ain* and *the*), in a large document, the repeated patterns may be more complex. The compression program's algorithm (a set of instructions designed to complete a solution in a step-by-step manner) therefore runs through the file several times to determine the optimal repeated patterns needed to obtain the greatest compression.



SOUND BYTE

File Compression

In this Sound Byte, you'll learn about the advantages of file compression and how to use Windows to compress and decompress files. This Sound Byte also teaches you how to find and install file compression shareware programs.

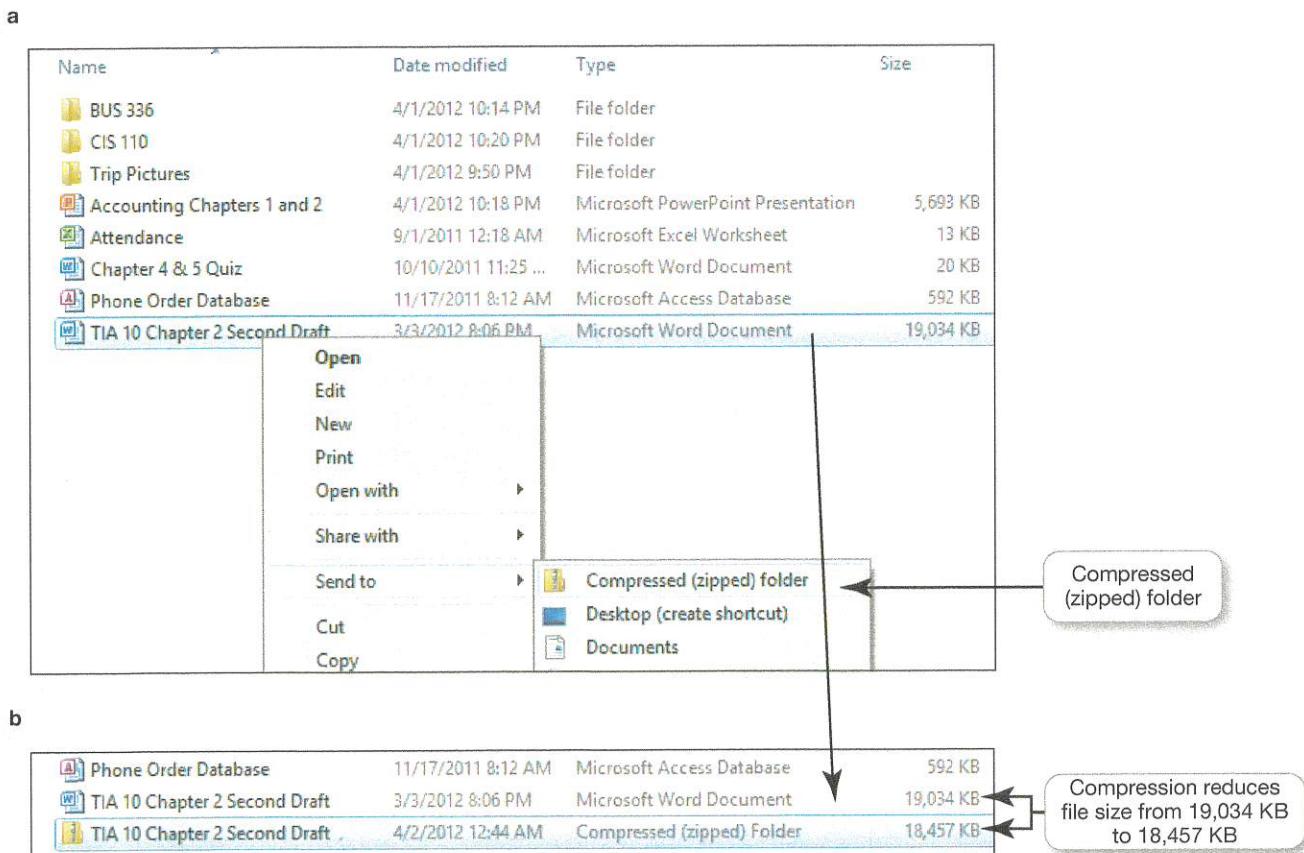


FIGURE 5.32 (a) File compression is a built-in utility of the Windows OS. (b) Compressing the Word document reduces the file size from 19,034 KB to 18,457 KB.

> To access the Windows file compression utility, right-click the file or folder that you want to compress, select **Send to** from the shortcut menu, and then select **Compressed (zipped) folder**.

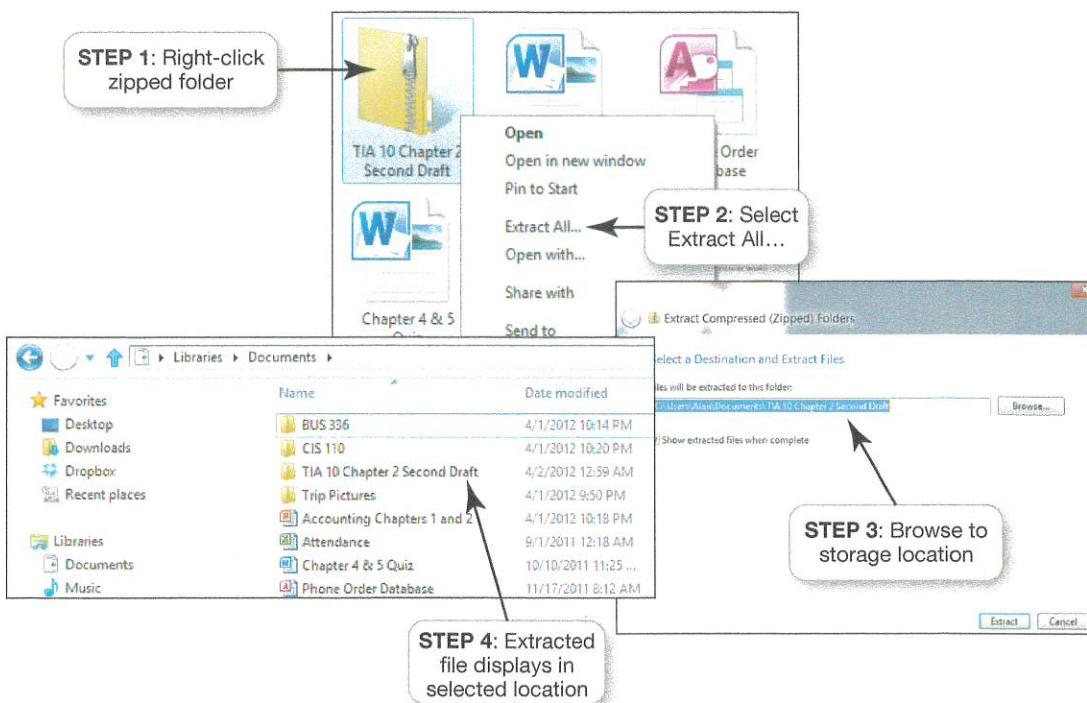


FIGURE 5.33 The Extraction Wizard in Windows makes unzipping compressed folders and files easy.

How effective are file compression programs?

Current compression programs can reduce text files by 50% or more, depending on the file. However, some files, such as PDF files, already contain a form of compression, so they don't need to be compressed further. Image files such as JPEG, GIF, and PNG files discard small variations in color that the human eye might not pick up. Likewise, MP3 files permanently discard sounds that the human ear can't hear. These graphic and audio files don't need further compression.

How do I decompress a file I've compressed? When you want to restore the file to its original state, you need to *decompress* the file. Generally, the program you used to compress the file can decompress the file as well (see Figure 5.33).

System Maintenance Utilities

What utilities can make my system work faster?

Disk Cleanup is a Windows utility that removes unnecessary files from your hard drive. These include files that have accumulated in the Recycle Bin as well as temporary files—files created by Windows to store data temporarily while a program is running. Windows usually deletes these temporary files when you exit the program, but sometimes it forgets to do this or doesn't have time because your system freezes or incurs a problem that prevents you from properly exiting a program.

Disk Cleanup also removes temporary Internet files (web pages stored on your hard drive for quick viewing) as well as offline web pages (pages stored on your computer so you can view them without being connected to the Internet). If not deleted periodically, these unnecessary files can slow down your computer.

How can I control which files Disk Cleanup deletes?

When you run Disk Cleanup, the program scans your hard drive to determine which folders have files that can be deleted and calculates the amount of hard drive space that will be freed up by doing so. You check off which type of files you would like to delete, as shown in Figure 5.34.

How can I diagnose potential errors or damage on my hard drive? Error-checking

is a Windows utility that checks for lost files and fragments as well as physical errors on your hard drive. Lost files and fragments of files occur as you save, resave, move, delete, and copy files on your hard drive. Sometimes the system becomes confused, leaving references on the **file allocation table**, or **FAT** (an index of all sector numbers in a table), to files that no longer exist or have been moved. Physical errors on the hard drive occur when the mechanism that reads the hard drive's data (which is stored as 1s or 0s) can no longer determine whether the area holds a 1 or a 0. These areas are called *bad sectors*. Sometimes Error-checking can recover the lost data, but more often, it deletes the files that are taking up space.

Error-checking also makes a note of any bad sectors so that the system won't use them again to store data. To locate Error-checking in Windows 8.1, display File Explorer, right-click the disk you want to diagnose, select Properties, and select the Tools tab. On Macs, you can use the Disk Utility to test and repair disks. Disk Utility is located in the Utilities subfolder in the Applications folder on your hard drive.

How can I check on a program that's stopped running?

If a program has stopped working, you can use the Windows **Task Manager** utility (see Figure 5.35) to check on the program or to exit the nonresponsive program.

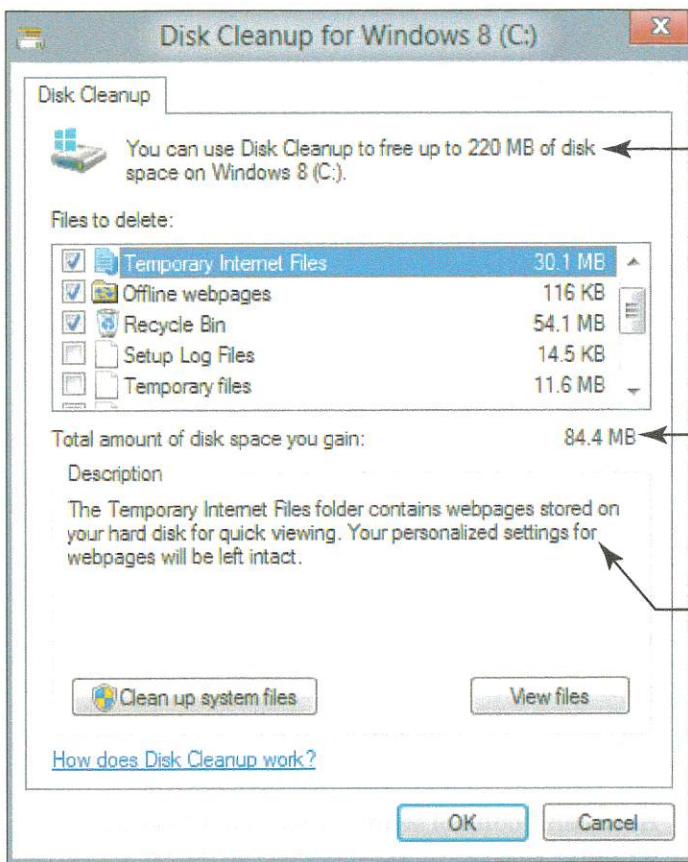


FIGURE 5.34 Using Disk Cleanup will help free space on your hard drive.
 > Disk Cleanup is accessed by displaying File Explorer, right-clicking on the disk you wish to clean, selecting Properties from the shortcut menu, and then clicking the Disk Cleanup button on the General tab.

In Windows 8.1, the Processes tab of Task Manager lists all the programs you're using and indicates their status. “Not responding” will be shown next to a program that stopped improperly. If the status section is blank (Figure 5.35), then the program is working normally. You can terminate programs that aren't responding by right-clicking the app name and selecting End Task from the shortcut menu.

System Restore and Backup Utilities

Is there an undo command for the system? Suppose you've just installed a new software program and your computer freezes. After rebooting the computer, when you try to start the application, the system freezes once again. You uninstall the new program, but your computer continues to freeze after rebooting. What can you do now?

SOUND BYTE Hard Disk Anatomy

In this Sound Byte, you'll watch a series of animations that show various aspects of a hard drive, including the anatomy of a hard drive, how a computer reads and writes data to a hard drive, and the fragmenting and defragmenting of a hard drive.

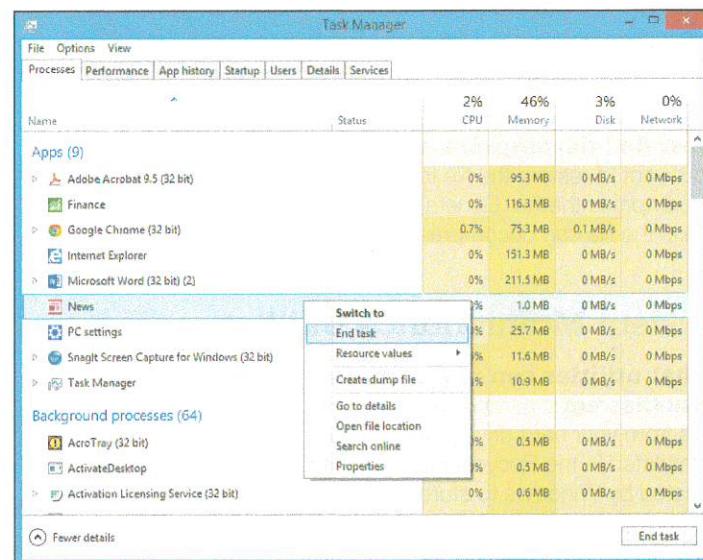


FIGURE 5.35 You can use Windows 8.1 Task Manager to close nonresponsive programs.
 > Task Manager is accessed by holding down **Ctrl**, **Alt**, and **Del** or by right-clicking on the taskbar at the bottom of the desktop.

DIG DEEPER

How Disk Defragmenter Utilities Work

Disk defragmenting programs group together related pieces of files on the hard drive, allowing the OS to work more efficiently. To understand how disk defragmenter utilities work, you first need to understand the basics of how a hard disk drive stores files. A hard disk drive is composed of several platters, or round, thin plates of metal, covered with a special magnetic coating that records the data. The platters are about 3.5 inches in diameter and are stacked onto a spindle. There are usually two or three platters in any hard disk drive, with data stored on one or both sides. Data is recorded on hard disks in concentric circles called **tracks**. Each track is further broken down into pie-shaped wedges, each called a **sector** (see Figure 5.36). The data is further identified by **clusters**, which are the smallest segments within the sectors.

When you want to save (or write) a file, the bits that make up your file are recorded onto one or more clusters of the drive. To keep track of which clusters hold which files, the drive also stores an index of all sector numbers in a table. To save a file, the computer looks in the table for clusters that aren't already being used. It then records the file information on those clusters. When you open (or read) a file, the computer searches through the table for the clusters that hold the desired file and reads that file. Similarly, when you delete a file, you're actually not deleting the file itself but rather the reference in the table to the file.

So, how does a disk become fragmented? When only part of an older file is deleted, the deleted section of the file creates a gap in the sector of the disk where the data was originally stored. In the same way, when new information is added to an older file, there may not be

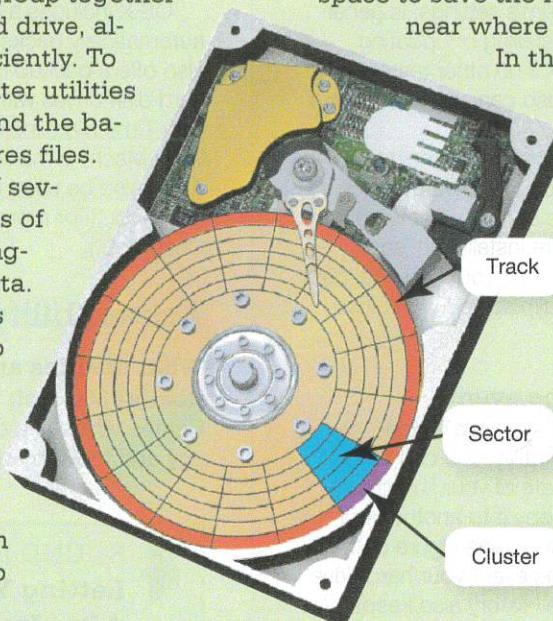


FIGURE 5.36 On a hard disk platter, data is recorded onto tracks, which are further divided into sectors and clusters.

space to save the new information sequentially near where the file was originally saved.

In that case, the system writes the added part of the file to the next available location on the disk, and a reference is made in the table as to the location of this file fragment. Over time, as files are saved, deleted, and modified, the bits of information for various files fall out of order and the disk becomes fragmented.

Disk fragmentation is a problem because the OS isn't as efficient when a disk is fragmented. It takes longer to locate a whole file because more of the disk must be searched for the various pieces, slowing down your computer.

Defragmenting tools take the hard drive through a defragmentation process in which pieces of files scattered over the disk are placed together and arranged sequentially on it.

Also, any unused portions of clusters that were too small to save data in before are grouped, increasing the available storage space on the disk. Figure 5.37 shows before and after shots of a fragmented disk that has gone through the defragmentation process.

The disk defragmentation utility in Windows 8 is set by default to automatically defragment the hard drive on a regular basis. Macs don't have a defragmentation utility built into the system. Those users who feel the need to defragment their Mac can use iDefrag, an external program from Coriolis Systems.

For more about hard disks and defragmenting, check out the Sound Byte "Hard Disk Anatomy."

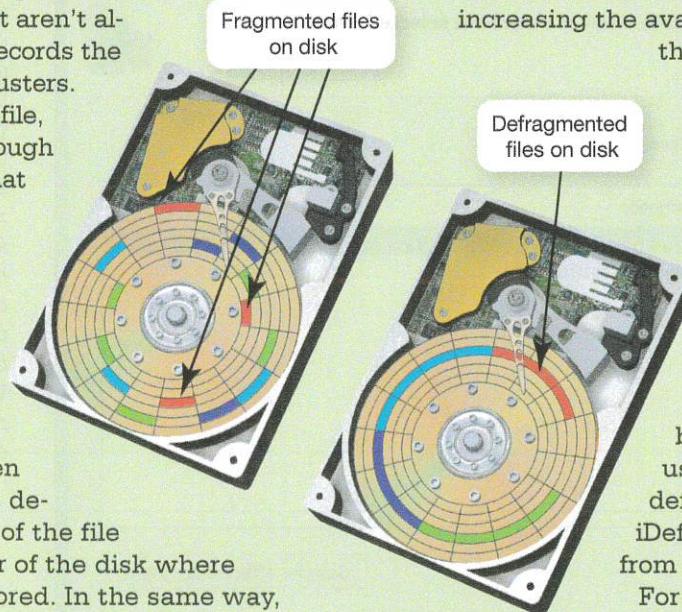


FIGURE 5.37 Defragmenting the hard drive arranges file fragments so that they are located next to each other. This makes the hard drive run more efficiently.

Windows has a utility called **System Restore** that lets you roll your system settings back to a specific date when everything was working properly. A **system restore point**, which is a snapshot of your entire system's settings, is generated prior to certain events, such as installing or updating software, or automatically once a week if no other restore points were created in that time. You also can create a restore point manually at any time.

Should problems occur, if the computer was running just fine before you installed new software or a hardware device, you could restore your computer to the settings that were in effect before the software or hardware installation (see Figure 5.38). System Restore doesn't affect your personal data files (such as Word documents or e-mail), so you won't lose changes made to these files.

How can I protect my data in the event

something malfunctions in my system? When you use the Windows 8.1 **File History** utility, you can have Windows automatically create a duplicate of your libraries, desktop, contacts, and favorites and copy it to another storage device, such as an external hard drive (see Figure 5.39). A backup copy protects your data in the event your hard drive fails or files are accidentally erased. File History also keeps copies of different versions of your files. This means that if you need to go back to the second draft of your history term paper, even though you are now on your fifth draft, File History should allow you to recover it. File History needs to be turned on by the user and requires an external hard drive (or network drive) that is always connected to the computer to function.

Windows 8 also includes recovery tools that allow you to complete backups of your entire system (system image) that you can later restore in the event of a major hard drive crash.

OS X includes a backup utility called Time Machine that automatically backs up your files to a specified location. Apple also offers backup hardware called Time Capsules, which are hard disk drives with wireless connectivity, designed to work with Time Machine and record your backup data. Because Time Machine makes a complete image copy of your system, it can also be used to recover your system in the case of a fatal error. (For more information on backing up your files, see Chapter 9.)

Accessibility Utilities

What utilities are designed for users with special needs? Microsoft Windows includes an Ease of Access Center, which is a centralized location for assistive technology and tools to adjust accessibility settings. In the Ease of

SOUND BYTE

Letting Your Computer Clean Up After Itself

In this Sound Byte, you'll learn how to use the various maintenance utilities within the OS. You'll also learn why maintenance tasks should be done on a routine basis to make your system more efficient.

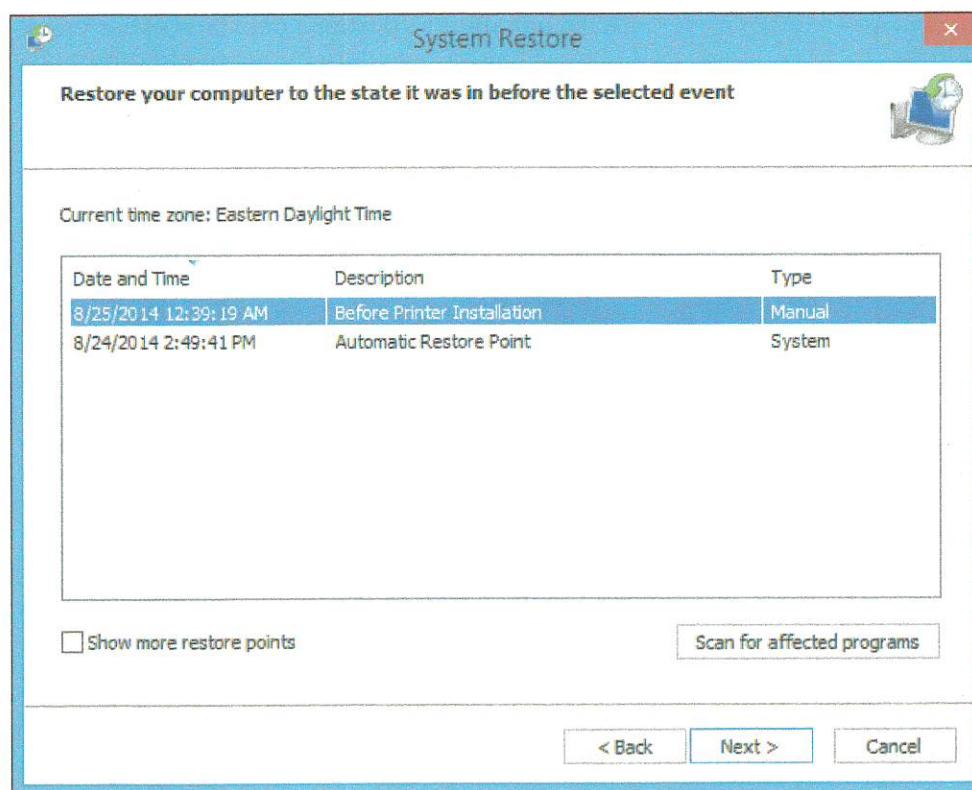


FIGURE 5.38 This System Restore Wizard shows both a restore point set manually by a user and one that was created automatically by Windows before a backup was run. Setting a restore point is good practice before installing any hardware or software.

> The System Restore Wizard is found by right-clicking the Start button, choosing System, selecting the System Protection link, and then clicking the System Restore button. The System Restore Wizard appears, with the restore points shown on the second page of the Wizard.

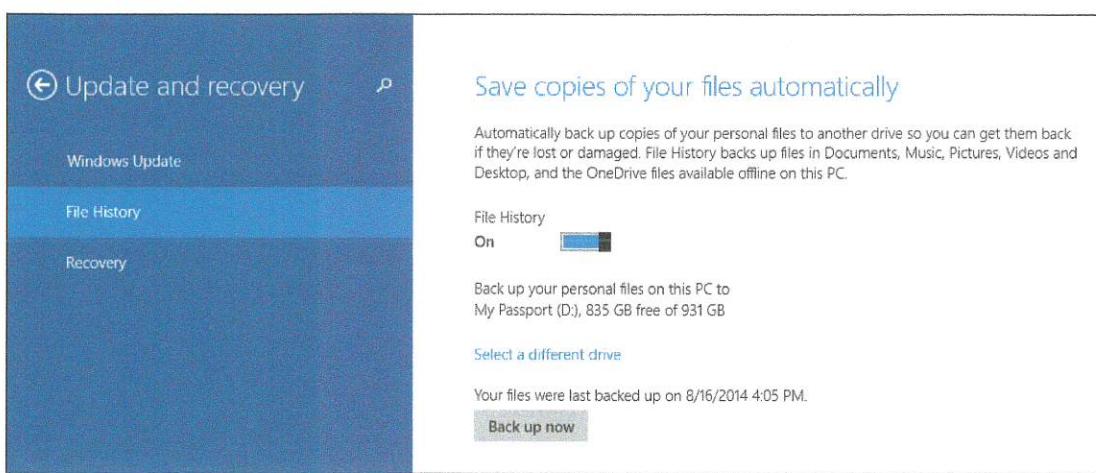


FIGURE 5.39 Windows 8.1
File History set up to back up files to an external hard drive.

>To access *File History*, display the Charms bar, choose **Settings**, select **Change PC settings**, choose **Update and recovery**, and then select **File History**.

Access Center, which is accessible from the Control Panel, you can find the tools to help users with disabilities, shown in Figure 5.40. The tools shown in the figure are just a sampling of the available tools. If you're not sure where to start or what settings might help, a questionnaire asks you about routine tasks and provides a personalized recommendation for settings that will help you better use your computer.

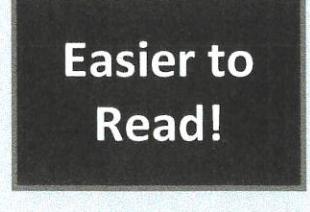
Whether you use Windows, OS X, Linux, or another operating system, a fully featured OS is available to meet your

needs. As long as you keep the operating system updated and regularly use the available utilities to fine-tune your system, you should experience little trouble from your OS. ■

Before moving on to the Chapter Review:

- Watch Replay Video 5.2 .
- Then check your understanding of what you've learned so far.

FIGURE 5.40

| Windows Ease of Access Tools | | |
|---|---|--|
| MAGNIFIER | NARRATOR | |
| <ul style="list-style-type: none"> Creates a separate window that displays a magnified portion of the screen  | <ul style="list-style-type: none"> Reads what is on screen Can read the contents of a window, menu options, or text you have typed  | |
| SPEECH RECOGNITION | ON-SCREEN KEYBOARD | HIGH CONTRAST |
| <ul style="list-style-type: none"> Allows you to dictate text and control your computer by voice  | <ul style="list-style-type: none"> Allows you to type with a pointing device  | <ul style="list-style-type: none"> Color schemes invert screen colors for vision-impaired individuals  |

Imagery Majestic/Fotolia; Anatoly Maslennikov/Fotolia; Gilles Lougassi/Fotolia)

>The Ease of Access Center is found by accessing the Control Panel and clicking **Ease of Access**.

check your understanding// review & practice

For a quick review to see what you've learned so far, answer the following questions. Visit pearsonhighered.com/techinaction to check your answers.

multiple choice

1. Which of the following is NOT considered to be a utility program?
 - a. Internet Explorer
 - b. Disk Cleanup
 - c. Task Manager
 - d. System Restore
2. The process of adding a Windows 8 app to the Start screen is known as
 - a. clipping.
 - b. visualizing.
 - c. pinning.
 - d. screening.
3. The Windows app used for locating files and folders is
 - a. Disk Manager.
 - b. Finder.
 - c. File Explorer.
 - d. Library Explorer.
4. Which of the following is NOT a common file name extension?
 - a. .docx
 - b. .jpg
 - c. .pptx
 - d. .zipped
5. The _____ utility can free up space on the hard drive.
 - a. Task Manager
 - b. Disk Cleanup
 - c. System Refresh
 - d. File Explorer

To take an autograded version of this review, please go to the companion website at pearsonhighered.com/techinaction, or go your MyITLab course.

Continue 

5 Chapter Review

summary //



Operating System Fundamentals

1. What software is included in system software?

- System software is the set of software programs that helps run the computer and coordinates instructions between application software and hardware devices. It consists of the operating system (OS) and utility programs.
- The OS controls how your computer system functions.
- Utility programs are programs that perform general housekeeping tasks for the computer, such as system maintenance and file compression.

2. What are the different kinds of operating systems?

- There are many different kinds of operating systems.
- Real-time operating systems (RTOSs) require no user intervention.
- A multiuser operating system (network operating system) provides access to a computer system by more than one user at a time.
- Smartphones have their own specific operating systems, which allow the user to multitask.
- Tablets use operating systems that allow interaction with touch-screen interfaces.
- Gaming consoles use operating systems developed specifically for those particular devices.

3. What are the most common operating systems?

- Microsoft Windows is the most popular OS. The most recent release is Windows 8.1.
- Another popular OS is the Mac OS, which is designed to work on Apple computers.
- Linux is an open source OS based on UNIX and designed primarily for use on personal computers.



What the Operating System Does

4. How does the operating system provide a means for users to interact with the computer?

- The OS provides a user interface that enables users to interact with the computer.
- Most OSs today use a graphical user interface (GUI). Common features of GUIs include windows, menus, and icons.

5. How does the operating system help manage resources such as the processor, memory, storage, hardware, and peripheral devices?

- When the OS allows you to perform more than one task at a time, it is multitasking. To provide for seamless multitasking, the OS controls the timing of the events on which the processor works.
- As the OS coordinates the activities of the processor, it uses RAM as a temporary storage area for instructions and data the processor needs. The OS is therefore responsible for coordinating the space allocations in RAM to ensure that there is enough space for the waiting instructions and data. If there isn't sufficient space in RAM for all the data and instructions, then the OS allocates the least necessary files to temporary storage on the hard drive, called *virtual memory*.
- The OS manages storage by providing a file-management system that keeps track of the names and locations of files and programs.
- Programs called *device drivers* facilitate communication between devices attached to the computer and the OS.

6. How does the operating system interact with application software?

- All software applications need to interact with the CPU. For programs to work with the CPU, they must contain code that the CPU recognizes.
- Rather than having the same blocks of code appear in each application, the OS includes the blocks of code to which software applications refer. These blocks of code are called *application programming interfaces* (APIs).



The Boot Process: Starting Your Computer

7. How does the operating system help the computer start up?

- When you start your computer, it runs through a special process called the *boot process*.
- The boot process consists of four basic steps: (1) The basic input/output system (BIOS) is activated when the user powers on the CPU. (2) In the POST check, the BIOS verifies that all attached devices are in place. (3) The OS is loaded into RAM. (4) Configuration and customization settings are checked.



The Windows Interface

8. What are the main features of the Windows interface?

- In Windows 8, the Start screen provides your first interaction with the OS and with access to your computer's apps, tools, and commonly used programs.
- The Windows 8 interface is designed for touch-screen devices.
- Windows 8 apps run full screen and feature commands hidden in app bars.
- Non-Windows 8 programs run on the desktop.



Organizing Your Computer: File Management

9. How does the operating system help me keep my computer organized?

- The OS allows you to organize the contents of your computer in a hierarchical structure of directories that includes files, folders, libraries, and drives.

- File Explorer helps you manage your files and folders by showing the location and contents of every drive, folder, and file on your computer.
- Creating folders is the key to organizing files.



Utility Programs

10. What utility programs are included in system software and what do they do?

- Some utility programs are incorporated into the OS; others are sold as stand-alone off-the-shelf programs.
- Common Windows utilities include those that enable you to adjust your display, add or remove programs, compress files, clean unnecessary files off your system, check for lost files and errors, restore your system to an earlier setting, back up your files, and check on programs that have stopped running.

Be sure to check out the companion website for additional materials to help you review and learn, including a Tech Bytes Weekly newsletter—pearsonhighered.com/technaction. And don't forget the Replay Videos .

key terms //

| | | | | | |
|---|-----|---|-----|-----------------------|-----|
| app bars | 178 | file path | 187 | Refresh your PC | 173 |
| application programming interface (API) | 171 | folder | 184 | registry | 173 |
| application software | 160 | graphical user interface (GUI) | 162 | root directory | 184 |
| authentication | 173 | interrupt | 167 | sector | 193 |
| basic input/output system (BIOS) | 172 | interrupt handler | 167 | source code | 183 |
| boot process | 172 | kernel (supervisor program) | 173 | spooler | 167 |
| charms | 179 | library | 184 | Start screen | 178 |
| cluster | 193 | Linux | 163 | swap file (page file) | 168 |
| command-driven interface | 166 | Mac OS | 162 | system files | 173 |
| device driver | 169 | menu-driven interface | 166 | System Restore | 194 |
| directory | 184 | Microsoft account | 173 | system restore point | 194 |
| Disk Cleanup | 191 | multitask | 161 | system software | 160 |
| Disk defragmenting | 193 | multiuser operating system (network operating system) | 161 | taskbar | 180 |
| distributions (distros) | 163 | operating system (OS) | 160 | Task Manager | 191 |
| Error-checking | 191 | paging | 168 | thrashing | 168 |
| event | 167 | path separator | 187 | track | 193 |
| extension (file type) | 186 | pinning | 179 | UNIX | 161 |
| file | 184 | platform | 164 | user interface | 160 |
| file allocation table (FAT) | 191 | Plug and Play (PnP) | 169 | utility program | 160 |
| file compression utility | 190 | power-on self-test (POST) | 173 | virtual memory | 168 |
| File Explorer | 184 | preemptive multitasking | 167 | Windows | 162 |
| File History | 194 | real-time operating system (RTOS) | 161 | Windows 8 | 162 |
| file management | 184 | Recycle Bin | 188 | Windows 8 apps | 178 |
| file name | 186 | | | Windows 8 interface | 178 |

chapter assessment // quiz

For a quick review to see what you've learned, answer the following questions. Submit the quiz as requested by your instructor. If you are using MyITLab, the quiz is also available there.

multiple choice

1. Which of the following is an OS that is NOT used on tablet computers?
 - a. iOS
 - b. BlackBerry
 - c. Android
 - d. Windows
2. Borrowing hard drive space to optimize RAM storage is known as
 - a. authentication.
 - b. virtual memory.
 - c. paging.
 - d. multitasking.
3. An example of an open source OS is
 - a. Windows.
 - b. OS X.
 - c. Linux.
 - d. DOS.
4. Which of the following is not considered an accessibility utility?
 - a. System Restore
 - b. Magnifier
 - c. Narrator
 - d. Speech Recognition
5. Apps specifically designed for Windows 8.1
 - a. run on the desktop.
 - b. run full screen.
 - c. can't be closed down once started.
 - d. use a large amount of RAM.
6. The Windows app used for file management is
 - a. Disk Manager.
 - b. Task Manager.
 - c. File Explorer.
 - d. Library Explorer.

true-false

1. Different versions of Linux are known as "distros."
2. The third step of the boot process is the power-on self-test (POST).
3. System restore points can only be created by Windows automatically on a regular schedule.
4. The Windows 8 desktop no longer includes the taskbar.

critical thinking

1. Protecting Embedded Systems

As more devices and appliances make use of RTOSs, the necessity of protecting them from hackers becomes increasingly critical. Developers are working to improve the security of the software and to safeguard communications between such devices. How concerned are you about the security of RTOSs in cars, smart homes, and wearable technology? Is enough being done to ensure the safety of these devices? What else could be done?

2. Ease of Access

Windows 8 and Mac OS X both include a number of features and utilities designed for users with special needs. Compare the offerings of each OS. Are there options offered by one OS that are not available in the other? Which OS do you think has the best selection? Can you think of any areas that have not been addressed by this assistive technology? Research software from third-party developers to see if there are other tools that would also be useful. Should these tools be included in the OS? Why or why not?

team time //

Choosing the Best OS

Problem

You're the owner of a technology consulting firm. Your current assignments include advising start-up clients on their technology requirements. The companies include a nonprofit social service organization, a small interior design firm, and a social media advertising agency. Obviously, one of the critical decisions for each company is the choice of OS.

Task

Recommend the appropriate OS for each company.

Process

1. Break up into teams that represent the three primary operating systems: Windows, Mac, or Linux.
2. As a team, research the pros and cons of your OS. What features does it have that would benefit each

company? What features does it not have that each company would need? Why would your OS be the appropriate (or inappropriate) choice for each company?

3. Develop a presentation that states your position with regard to your OS. Your presentation should have a recommendation and include facts to back it up.
4. As a class, decide which OS would be the best choice for each company.

Conclusion

Because the OS is the most critical piece of software in the computer system, the selection should not be taken lightly. The OS that is best for a nonprofit social service organization may not be best for an interior design firm. A social media advertising agency may have different needs altogether. It is important to make sure you consider all aspects of the work environment and the type of work being done to ensure a good fit.

ethics project //

OS Upgrades

In this exercise, you'll research and then role-play a complicated ethical situation. The role you play may or may not match your own personal beliefs, but your research and use of logic will enable you to represent whichever view is assigned. An arbitrator will watch and comment on both sides of the arguments, and together, the team will agree on an ethical solution.

Problem

Software developers spend millions of dollars developing new versions of their OS products. Developers argue that new OS versions are needed to meet consumer demands for popular features. Consumers, however, often resent the constant cycle of upgrades, which require them to learn the new features and pay for new software. Most schools feel they need to teach the current version of an OS but sometimes can't afford the upgrades.

Research Areas to Consider

- Windows 8 features vs. Windows 7 features
- Software licensing agreements
- Costs for Windows 8 upgrades
- Costs for adding touch-screens to existing desktop computers

Process

1. Divide the class into teams.
2. Research the areas cited above and devise a scenario in which a college is considering upgrading to Windows 8 from Windows 7 and needs to justify an increase in student fees to accomplish the upgrade.
3. Team members should write a summary that provides background information for their character—for example, representative of Microsoft, student, parent, teacher, or arbitrator—and that details their character's behaviors to set the stage for the role-playing event. Then, team members should create an outline to use during the role-playing event.
4. Team members should present their case to the class or submit a PowerPoint presentation for review by the rest of the class, along with the summary and resolution they developed.

Conclusion

As technology becomes ever more prevalent and integrated into our lives, more and more ethical dilemmas will present themselves. Being able to understand and evaluate both sides of the argument, while responding in a personally or socially ethical manner, will be an important skill.

Solve This

Mobile Operating Systems: Changing Market Share

Using Excel 2013, you will display the market share statistics of both mobile and desktop operating systems using line, column, and pie charts.

You will use the following skills as you complete this activity:

- | | |
|------------------------------------|----------------------|
| • Create a Line Chart | • Add Shape to Chart |
| • Create and Format a Pie Chart | • Insert Sparklines |
| • Create and Format a Column Chart | |

Instructions:

1. Open **TIA_Ch5_Start** and save as **TIA_Ch5_LastFirst**.
2. In cell B3 type **2011**. Create a line chart from the range A3:E9. Modify the chart as follows:
 - a. Add a title: **Change in Mobile OS Market Share 2011–2014**. *2011–2014* should be on a separate line. Change the font size of *2011–2014* to 10.
 - b. Move the chart to a separate worksheet. Rename the new worksheet **Line Chart**, and place after the Data worksheet.
 - c. Filter out the *Symbian and Others* data so only *Android*, *iOS*, *Windows*, and *Blackberry* data displays.
 - e. Add a **Line Callout 1** shape to the chart with the line pointing between the 2013 and 2014 Android data. Add text to the callout: **Looks like Android market share will surpass iOS market share in 2015.**

Hint: Line Callout 1 is in the Callouts section in the Insert Shape group on the FORMAT CHART TOOLS tab.

3. Create a pie chart from the ranges A3:A9 and E3:E9.

Hint: Use the CTRL button to select non-adjacent ranges. Modify the chart as follows:

- a. Add a title: **2014 Mobile OS Market Share**
- b. Use **Quick Layout 1** to add data % and Series data labels to each data point.
- c. Resize the chart so it fits in the range A14:H30.

4. Create a clustered column chart that compares just Android and iOS data for 2011–2014. Modify the chart as follows:

- a. Add a title: **Android vs. iOS Market Share**
- b. Format the chart with **Style 8**.
- c. Move the chart to a separate worksheet. Rename the new worksheet **Column Chart**, and place it after the *Line Chart* worksheet.

5. Add a **Line Sparkline** to cell F4 using the data in range B4:E4. Using the **Fill Handle**, copy the Sparkline to range F5:F9. Add a **High Point** to each Sparkline.

6. **Save** the document and submit based on your instructor's directions.

The ethical choices we make have a far-reaching impact on our lives. In this Technology in Focus feature, we examine how technology and ethics affect each other. We'll discuss several key issues related to technology and ethics, including the following:

- Social justice
- Intellectual property
- Privacy
- E-commerce
- Electronic communication
- Computer abuse

But first, let's get started by asking an important question: What is ethics?

What Is Ethics?

Ethics is the study of the general nature of morals and of the specific moral choices individuals make. Morals involve conforming to established or accepted ideas of right and wrong (as generally dictated by society) and are usually viewed as being black or white. Ethical issues often involve subtle distinctions, such as the difference between fairness and equity. Ethical principles are the guidelines you use to make decisions each day.

For example, say you stop to use a photocopier on campus. You discover a copy of the upcoming final exam for your psychology course that your teacher left behind. Do you give it back to your professor without looking at the questions? Do you share it with your friends so you can all get good grades on the final? Do you give a copy to your friend who really needs to pass the

course in order to prevent losing his or her financial aid?

Doesn't everyone have the same basic ethics?

There are many systems of ethical conduct. Figure 1 lists the five major ethical systems.

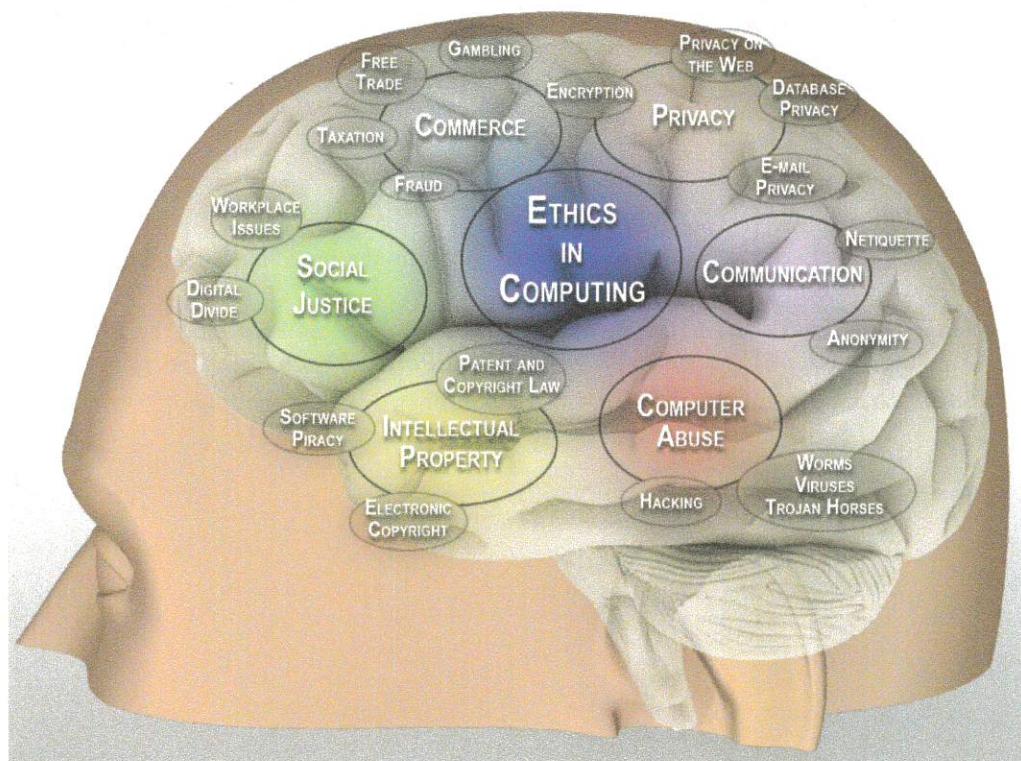


FIGURE 1

Systems of Ethics

| ETHICAL SYSTEM | BASIC TENETS | EXAMPLES |
|---|---|---|
| Relativism  | <ul style="list-style-type: none">No universal moral truthMoral principles dictated by cultural tastes and customs | Topless bathing is prevalent in Europe but generally banned on public beaches in the United States |
| Divine Command Theory  | <ul style="list-style-type: none">God is all-knowing and sets moral standardsConforming to God's law is right; breaking it is wrong | Christians believe in rules such as the Ten Commandments |
| Utilitarianism  | <ul style="list-style-type: none">Actions are judged solely by consequencesActions that generate greater happiness are judged to be better than actions that lead to unhappinessIndividual happiness is not important—consider the greater good | Using weapons of mass destruction ends a war sooner and therefore saves lives otherwise destroyed by conventional fighting |
| Virtue Ethics  | <ul style="list-style-type: none">Morals are internalStrive to be a person who behaves well spontaneously | A supervisor views the person who volunteered to clean up a park as a better person than the workers who are there because of court-ordered community service |
| Deontology (Duty-Based)  | <ul style="list-style-type: none">Focus on adherence to moral duties and rightsMorals should apply to everyone equally | Human rights (like freedom of religion) should be respected for all people because human rights should be applied universally |

(Solomin Andrey/Fotolia; Sergey Galusko/Fotolia; kentoh/Fotolia; Scanrail/Fotolia; Alexmilos/Fotolia; Scanrail/Fotolia)

Aren't laws meant to guide people's ethical actions?

Laws are formal, written standards designed to apply to everyone. Laws are enforced by government agencies and interpreted by the courts. However, it's impossible to pass laws that cover every possible behavior in which humans can engage. Therefore, ethics provide a general set of unwritten guidelines for people to follow.

Is unethical behavior the same as illegal behavior?

Unethical behavior isn't necessarily illegal. Take the death penalty. In many U.S. states, putting convicted criminals to death for certain crimes is legal. However, many people consider it unethical to execute a human for any reason.

Not all illegal behavior is unethical, though. Civil disobedience, which is manifested by intentionally refusing to obey certain laws, is used as a form of protest to effect change. Gandhi's nonviolent resistance to the British rule of India, which led to India's establishment as an independent country, is an example of civil disobedience.

Is it ever ethical for one country to control another country's people?

Note that there is also a difference between *unethical* behavior and *amoral* behavior:

- *Unethical behavior* can be defined as not conforming to a set of approved standards of behavior. For instance, using your phone to text message a test answer to your friend during an exam is unethical.
- *Amoral behavior* occurs when a person has no sense of right and wrong and no interest in the moral consequences of his or her actions, such as when a murderer shows no remorse for his or her crime.

Which system of ethics works best? There is no universal agreement on which is the best system of ethics. Most societies use a blend of different systems. Regardless of the ethical system of the society in which you live, all ethical decisions are greatly influenced by personal ethics.

Personal Ethics

What are personal ethics? Every day you say and do certain things, and each time, you're making decisions. As you choose your words and actions, you're following a set of **personal ethics**—a set of formal or informal ethical principles you use to make decisions in your life. Some people have a clear, well-defined set of principles they follow.

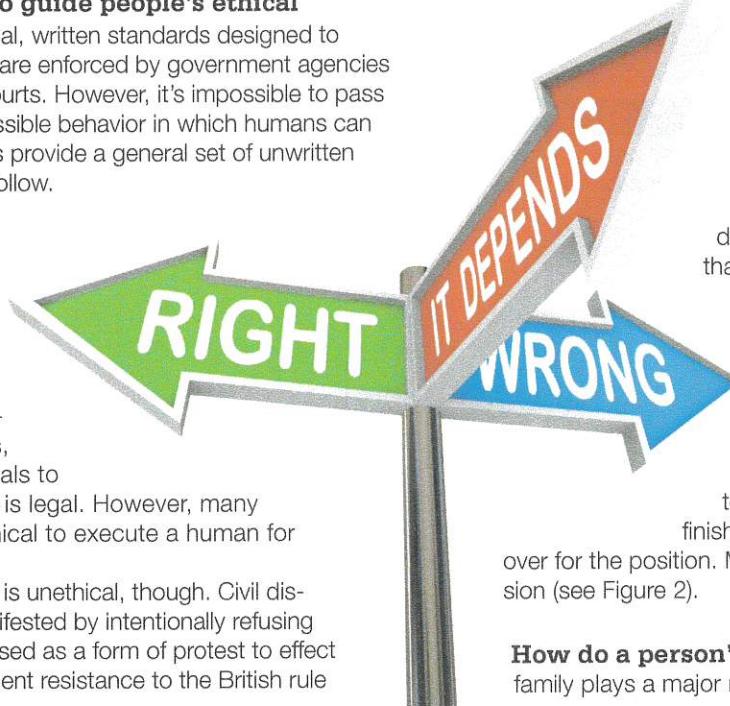


FIGURE 2 It would be nice if there were signposts to ethical conduct, but the issues are complex. (Ooncept/Shutterstock)

Others' ethics are inconsistent or are applied differently in different situations.

It can be challenging to adhere to your own ethical principles if the consequences of your decisions might lead to an unhappy result.

For example, to get the job of your dreams, should you say on your résumé that you've already finished your degree, even though you're still one credit short? Is this lying? Is such behavior justified in this setting? After all, you do intend to finish that last credit, and you would work really hard for this company if you were hired. If you tell the truth and state that you haven't finished college yet, you might be passed over for the position. Making this choice is an ethical decision (see Figure 2).

How do a person's ethics develop? Naturally, your family plays a major role in establishing the values you cherish in your own life, and these might include a cultural bias toward certain ethical positions (see Figure 3). Your religious affiliation is another major influence on your ethics because most religions have established codes of ethical conduct. How these sets of ethics interact with the values of the larger culture is often challenging. Issues such as abortion, the death penalty, and war often create conflict between personal ethical systems and the larger society's established legal-ethical system.

As you mature, your life experiences also affect your personal ethics. Does the behavior you see around you make sense within the ethical principles that your family, your church, or your first-grade teacher taught you? Has your experience led you to abandon some ethical rules and adopt others? Have you modified how and when you apply these laws of conduct depending on what's at stake?

What if I'm not sure what my personal ethics are?

When you have a clear idea of what values are important to you, it may be easier to handle situations in your life that demand ethical action. Follow these steps to help define a list of personal values:

1. **Describe yourself.** Write down words that describe who you are, based on how others view you. Would a friend describe you as honest, or helpful, or kind? These keywords will give you a hint as to the values and behaviors that are important to you.
2. **List the key principles you believe in.** Make a list of the key principles that influence your decisions. For example, would you be comfortable working in a lab that used animals for medical research? If not, is it because