

Discovering Computers 2016

Tools, Apps, Devices, and the Impact of Technology

Chapter 1

Introducing Today's Technologies



Objectives Overview

Differentiate among laptops, tablets, and servers

Describe the purpose and uses of smartphones, digital cameras, portable media players, e-book readers, and game devices

Describe the relationship between data and information

Briefly explain various input options

Differentiate the Internet from the web, and describe the relationship among the web, webpages, websites, and web servers

Explain the purpose of a browser, a search engine, and an online social network

Objectives Overview

Briefly describe digital security risks associated with viruses and other malware, privacy, your health, and the environment

Differentiate between an operating system and applications

Differentiate between wired and wireless technologies, and identify reasons individuals and businesses use networks

Discuss how society uses technology in education, retail, finance, entertainment, health care, travel, government, science, publishing, and manufacturing

Identify technology used by home users, small office/home office users, mobile users, power users, and enterprise users

OVERVIEW

本章為簡介，大多的名詞與概念將於後面章節作較深入的介紹

A World of Technology

- Because technology changes, you must keep up with the changes to remain digitally literate
- **Digital literacy** involves having a current knowledge and understanding of computers, mobile devices, the Internet, and related technologies



Technology is an integral part of life at school, home, and work.

A World of Computers

understanding of computers, mobile devices,
the Internet, and related technologies

- **Computer literacy(電腦素養)**
 - 又稱 **digital literacy**
 - 具備最新的電腦知識及了解電腦行動裝置網際網路等相關技術
- 決定電腦素養的要素隨科技而改變
- 需跟隨科技改變以保有電腦素養

computer literacy

作者	電腦素養的詮釋
Moursund (1976)	具備非技術和低技術之電腦能力之外，且能了解電腦的限制及能應用電腦於社會、職業及教育。
Rawitsch (1978)	能善加運用電腦軟硬體的功能及特性，成為解決問題的輔助工具。
Watt (1980)	包含電腦技能、知識、評估及之間的整合，另外個人能利用電腦於工作中，發揮其效能所具備的知識、技能及態度，且能具有生產力。
Luehrmann (1981)	操作電腦的能力及經驗，包括電腦硬體架構、軟體能力、電腦應用與社會倫理等。
Sinomson, Matt & Maurer (1987)	具有電腦認知、撰寫程式的能力、使用電腦應用程式的能力，三者間互為關係而不互斥。
MaSSound (1991)	電腦資訊時代，電腦素養技能為必備的基本能力，正如同聽、說、讀、寫的基本素養一般重要。
Paul (1994)	能利用電腦來獲取所需的資訊，解決問題，完成資料處理的工作。

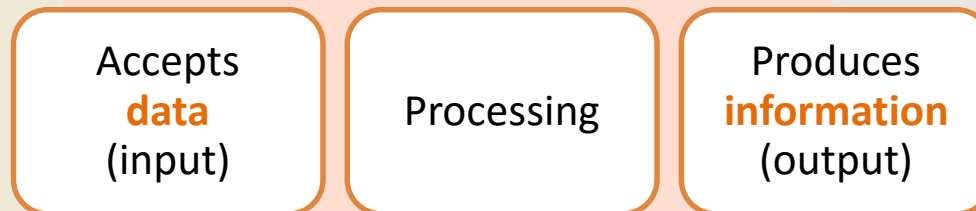
Computers

- A **computer** is an electronic device, operating under the control of instructions stored in its own memory, that can accept data(input), process the data according to specified rules, produce information(output), and store the information for future use.
是依據本身記憶體內的控制指令而運作的電子裝置
- A computer contains many electric, electronic, and mechanical components known as **hardware**

Computers

Information Processing Cycle

- Computer carry out process using **instructions**, which **are the steps that tell the computer how to perform a task**.
 - A Collection of related instructions organized for a common purpose is referred to as **software**.



Information Processing Cycle 資訊處理週期

Computers

- Type of personal computer 個人電腦分類
 - Laptop (notebook)
 - Tablet
 - Desktop and All-in-ones
 - Server





CONSIDER THIS

Which type of computer – laptop, tablet, or desktop – is best

Mobile and Game Devices

- Computing device small enough to hold in your hand
- Popular types of mobile devices are
 - Smartphone
 - Digital camera
 - Portable and digital media player
 - E-book reader
 - Wearable devices
 - Game device

Mobile and Game Devices

- Four popular type of messages that you can send with smartphones

Text
message

Picture
message

Video
message

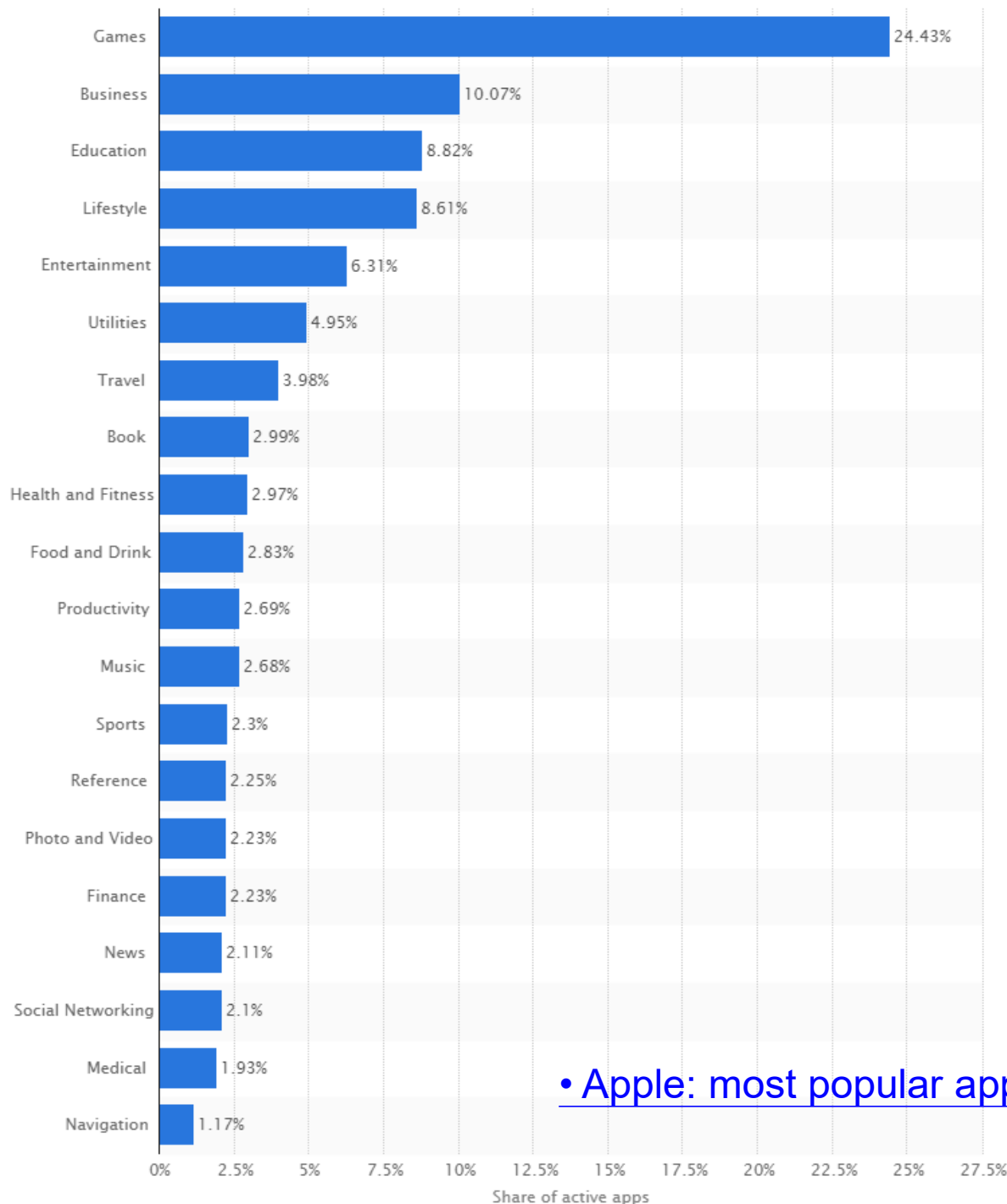
Voice
messages



INTERNET RESEARCH

What are some app stores?

Search for : popular app stores



- The statistic shows the most popular categories in the Apple App Store ranked share of active apps. In September 2016, business apps were the second-most popular category, with a share of 10.07 percent of active all apps being business apps. As of summer 2016, [more than 130 billion apps](#) were downloaded from the App Store.

• [Apple: most popular app store categories 2016 | Statistic](#)

Mobile and Game Devices

- A digital media player or streaming media player is a device, typically used in a home that streams digital media from a computer or network to television, projector, or some other entertainment device.



ipod

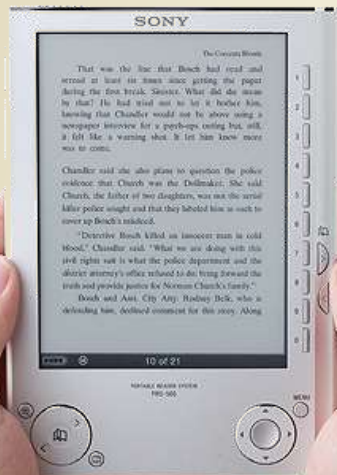


viewsonic-vmp70-digital-media-player

Mobile and Game Devices

E-book reader

- Touch screen



Wearable devices

- A wearable device or wearable is a small, mobile computing consumer device designed to be worn.
- Communicate with a mobile device or computer.
- Wearable device include activity trackers, smartwatches, and smartglasses.



數位匯流是大趨勢

digital convergence

- 數位匯流是四種傳統上相對獨立的產業的融合過程。
- 這四種傳統產業指的是IT產業（ Information Technology ）、電信產業（ Telecommunication ）、消費性電子產業（ Consumer Electronics ）、和娛樂產業（ Entertainment ）。
- 「數位匯流」通常被理解為傳統上相對獨立的三種業務—電信、網路和廣播電視的互相融合，而整個通訊、傳播及資訊之數位匯流，基本上包含法令之匯流、營運平台之匯流、傳輸平台之匯流、多元內容之匯流、數位終端之匯流以及應用服務之匯流。
- 國內數位匯流發展六大主軸分別為推動電信匯流服務、整備高速寬頻網路、加速電視數位化進程、建構新興視訊服務、促進通訊傳播產業升級、調和匯流法規環境。

何謂數位匯流



<http://www.tdcda.org.tw/>

Data and Information

- Computers process data (input) into information(output) and often store the data and resulting information for future use.

Data and Information

- **Data** is a collection of unprocessed items, which can include text, numbers, images, audio and video.
 - 訂購項目，單價，數量，收款金額
- **Information** conveys meaning and is useful to people.
 - 收據

The diagram illustrates the transformation of raw data into useful information through a series of processes. A large orange arrow points from the 'DATA' section to the 'INFORMATION' section, with a blue box labeled 'PROCESSES' containing the steps.

DATA

2 Medium Sodas	\$1.49 each
1 Small Turkey Sub	\$3.49 each
1 Caesar Salad	\$4.49 each
1 Bag of Chips	\$0.99 each
3 Cookies	\$0.39 each
Amount Received	\$20.00

PROCESSES

- 將每項商品的訂購數量乘以商品單價（例如 $2 \times 1.49 = 2.98$ ）算出每種商品的總價。
- 排列資料。
- 把所有商品的總價加總，算出顧客所採購的總價（13.12）。
- 以收到的金額減去採購總價，得出應該找錢給顧客的金額（ $20.00 - 13.12 = 6.88$ ）。

INFORMATION

Arrow Deli
10 Park Street
Maple River, DE 20393
(734) 555-2939

QTY	ITEM	TOTAL
2	Medium Sodas	2.98
1	Small Turkey Sub	3.49
1	Caesar Salad	4.49
1	Bag of Chips	0.99
3	Cookies	1.17
Total Due		13.12
Amount Received		20.00
Change		6.88

Thank You!

Data and Information

DATA (input)

2 Medium Sodas	\$1.49 each
1 Small Turkey Sub	\$3.49 each
1 Caesar Salad	\$4.49 each
1 Bag of Chips	\$0.99 each
3 Cookies	\$0.39 each
Amount Received	\$20.00

STORAGE and PROCESSES

- Stores entered data.
- Computes each item's total price by multiplying the quantity ordered by the item price (i.e., $2 * 1.49 = 2.98$).
- Organizes data.
- Sums all item total prices to determine order total due from customer (13.12).
- Calculates change due to customer by subtracting the order total from amount received ($20.00 - 13.12 = 6.88$).
- Stores resulting information.



INFORMATION (output)

Arrow Deli 10 Park Street Maple River, DE 20393 (734) 555-2939		
QTY	ITEM	TOTAL
2	Medium Sodas	2.98
1	Small Turkey Sub	3.49
1	Caesar Salad	4.49
1	Bag of Chips	0.99
3	Cookies	1.17
Total Due		13.12
Amount Received		20.00
Change		6.88
Thank You!		

Data and Information

- Input Device
 - Allows you to enter data and instructions into a computer

Keyboards

Pointing
Devices

Voice and
Video Input

Scanners

Data and Information

Input Device



desktop keyboard



laptop keyboard



on-screen keyboard



mini keyboard



virtual keyboard

- A keyboard contains keys you press to enter data and instructions into a computer or mobile device

Data and Information

Input Device

- A pointing device is an input device that allows a user to control a small symbol on the screen called a **pointer**
- Some mobile devices and computers enable you to speak data instructions using **voice input** and to capture live full-motion images using **video input**



Data and Information

Input Device

- A scanner is a **light-sensing** input device that converts printed text and images into a form the computer can process



Data and Information

Output Device

- An **output device** is any hardware component that conveys information from a computer or mobile device to one or more people
- A **printer** is an output device that produces text and graphics on a physical medium such as paper



Data and Information

Output Device

- A **3-D printer** can print solid objects, such as clothing, prosthetics, eyewear, implants, toys, parts, prototypes, and more



Data and Information

Output Device

- A **display** is an output device that visually conveys text, graphics, and video information



Data and Information

Output Device

- **Speakers** allow you to hear audio such as music, voice, and other sounds
- **Earbuds**
- **Headphones**



Data and Information

Memory and storage

Memory consists of electronic components that store instructions waiting to be executed and the data needed by those instructions

A computer keeps data, instructions, and information on a **storage media**

A **storage device** records (writes) and/or retrieves (reads) items to and from storage media

Data and Information

Memory and storage

See P16



Hard Disk



Solid-State
Drive



USB Flash Drive



Memory Card



Optical Disc

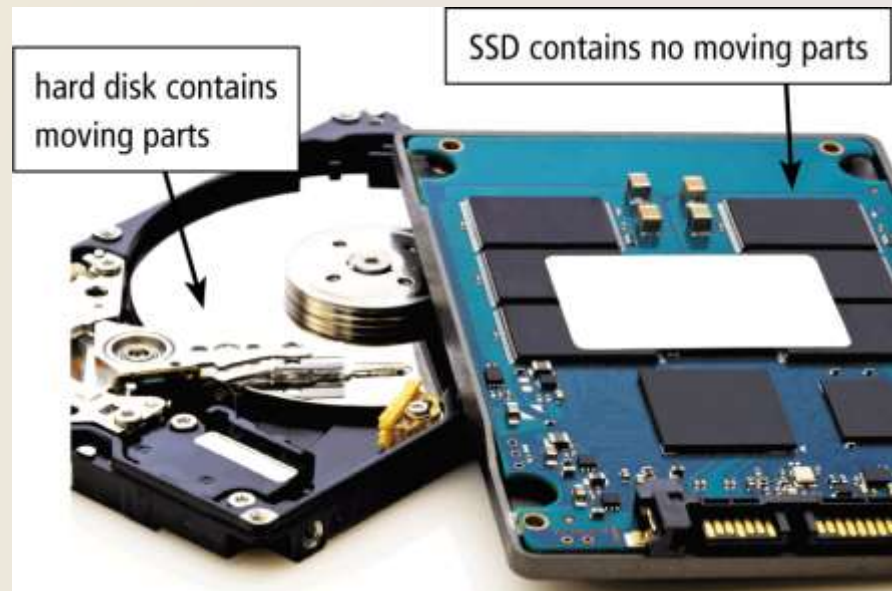


Cloud Storage

Data and Information

Memory and storage

- Solid-State Drives
 - Is a storage device that typically uses flash memory to store data, instructions, and information.
 - Flash memory contains no moving parts, making it more durable and shock resistant than other types of media.

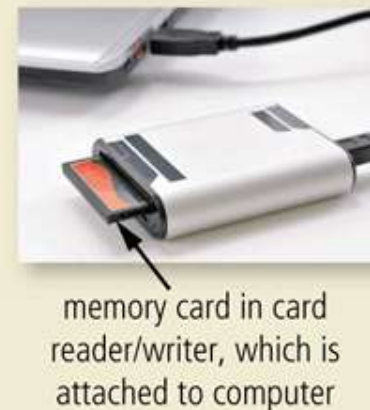
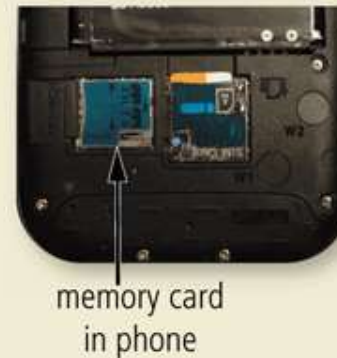


Data and Information

Memory and storage



- USB Flash Drives
- Memory Card



Data and Information

Memory and storage

- Optical Discs



- Cloud Storage

- Is an internet service that provides remote storage to computer users.



<http://www.justcloud.com/>

Data and Information

Memory and storage

- Backup
 - A backup is a duplicate of content on a storage medium that you can use in case the original is lost, damaged, or destroyed.

The Internet

- The **Internet** is a worldwide collection of networks that connects millions of businesses, government agencies, educational institutions, and individuals



The Internet

World Wide Web

- The **World Wide Web** (or web, for short) is a global library of information available to anyone connected to the Internet
 - The **web** consists of a worldwide collection of electronic documents, each of which is called a **webpage**
 - A **website** is a collection of related webpages
 - A **web server** is a computer that delivers requested webpages to your computer

The Internet

The screenshot shows the Newsradio 620 WTMJ Time Saver Traffic website. The navigation bar at the top includes links for Home, News, Weather, Sports, Traffic, What's On, Podcasts, Blogs, Events, Listener Club, Closings, Contact, and Photos. The main heading is "NEWSRADIO 620 WTMJ TIME SAVER TRAFFIC". Below this, there are social media links for Twitter (23) and Facebook (1), and a "SHARE" button. A "620 WTMJ NEWSRADIO LIVE STREAM" section features a "LISTEN NOW" button and the text "ON NOW: Brewers Extra Innings". A "TIMESAVER TRAFFIC" banner is sponsored by Great Midwest Bank and powered by traffic.com. The "traffic.com Milwaukee Area Traffic" section displays traffic conditions for WI-119 Westbound, I-794 Lake Pkwy Northbound, and I-794 Lake Pkwy Southbound, including jam factor and incident counts. A "TRAFFIC LINKS" section includes "CURRENT TRAFFIC CONDITIONS", "MAPS", and "HOT SPOTS". A "STORM TEAM 4" weather section for Milwaukee, WI (53201) shows the date Aug 21, 2012, and weather details: High: 74°, Low: 55°, Winds: SSW 7 MPH, 63% humidity. It also includes links for "Watch latest weather video", "7-Day Forecast", and "ALERTS".

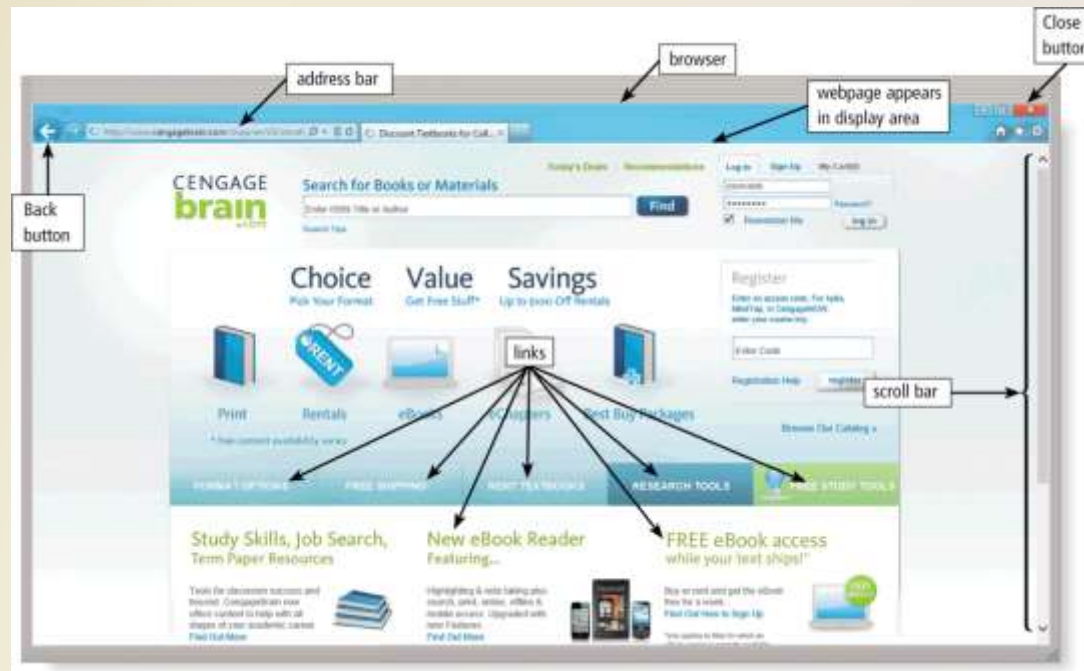
Annotations on the screenshot include:

- text**: Points to the "NEWSRADIO 620 WTMJ TIME SAVER TRAFFIC" heading.
- audio link**: Points to the "LISTEN NOW" button in the live stream section.
- graphics link**: Points to the "TIMESAVER TRAFFIC" banner.
- graphics**: Points to the "traffic.com Milwaukee Area Traffic" section.
- pointer on a link**: Points to the "MAPS" link in the "TRAFFIC LINKS" section.
- video link**: Points to the "Watch latest weather video" link in the weather section.
- text link**: Points to the "ALERTS" link in the weather section.

The Internet

Web browser

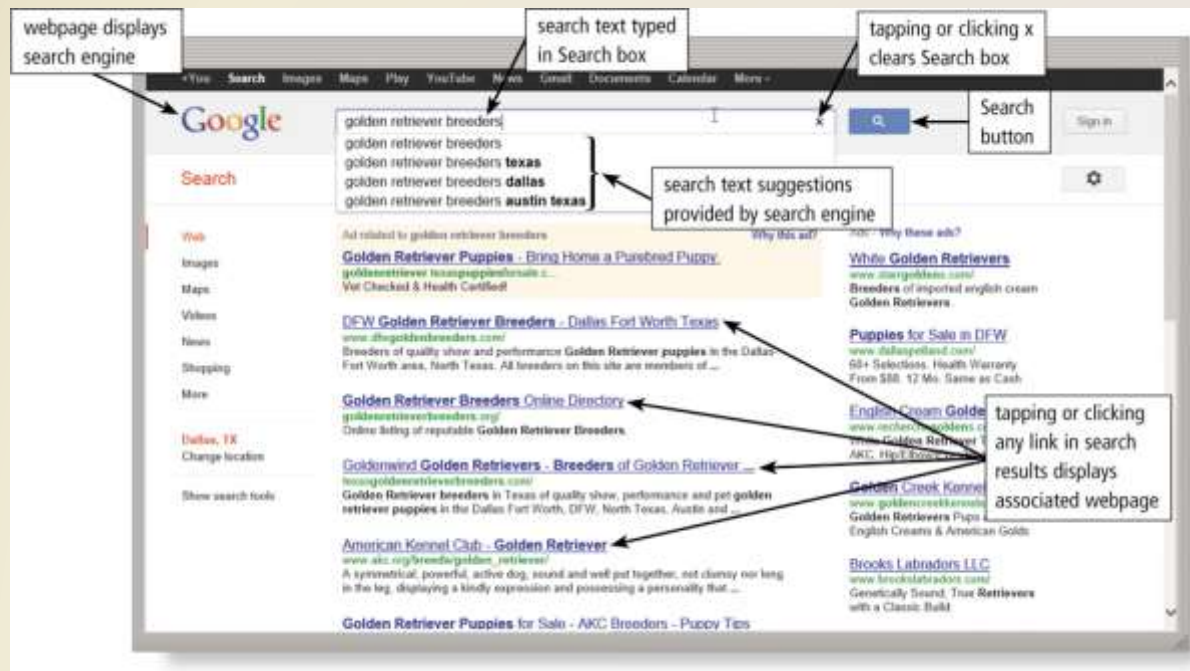
- A **browser** is software that enables users with an Internet connection to access and view webpages on a computer or mobile device



The Internet

Web searching

- A **search engine** is software that finds websites, webpages, images, videos, news, maps, and other information related to a specific topic



The Internet

online social network

- An **online social network** encourages members to share their interests, ideas, stories, photos, music, and videos with other registered users



The Internet

Internet Communications

- Instant messaging
- VoIP
- FTP

Digital Safety and Security

- It is important that users protect their computers and mobile devices

Viruses and
Other
Malware

Privacy

Health
Concerns

Environmental
Issues

Viruses and Other Malware

- **Malware**, short for malicious software, is software that acts without a user's knowledge and deliberately alters the computer's and mobile device's operations.
- Examples of malware include
 - viruses, worms, Trojan horses, rootkits, spyware, adware, and zombies. with malware.

Protection from Viruses and Other Malware

1. Use virus protection software.
2. Use a firewall.
3. Be suspicious of all unsolicited email attachments.
4. Disconnect your computer from the Internet.
5. Download software with caution.
6. Close spyware windows.
7. Before using any removable media, scan it for malware.
8. **Keep current.** Install the latest updates for your computer software. Stay informed about new virus alerts and virus hoaxes.
9. **Back up regularly.**



INTERNET RESEARCH

What are other techniques that deter
identity theft? 身份盜竊

Search for: **prevent identity theft**

Identity theft

- 描述一個平凡上班族因為身分被盜用而搞到身敗名裂。
- 他為了恢復信譽不得不採取極端手段，卻發現自己惹上了令人抓狂的大麻煩。
- 黛安娜永遠有用不完的錢，在奧蘭多近郊過得爽歪歪，只要是她看上的東西，這位敗家女王絕對刷卡不手軟。但問題只有一個：她用來敗家的信用卡其實屬於「山帝·畢格羅·派德森」，他人遠在丹佛，是個財務人員。這個無辜的倒楣鬼莫名其妙被控犯下了一連串罪狀，但卻投訴無門、抗議無效，因為警察沒空理他也無能為力。這樣的窘境逼得珊迪·畢格羅·派德森本尊走投無路，只好自己南下逮人。
- 珊迪只有一週的時間能抓住這個無孔不入盜用他個資的女騙子，不然他的生活就會變得一團糟。不管是連哄帶騙、賄賂收買或是使用蠻力，珊迪都要想辦法把她帶到2000哩遠的科羅拉多州，只是他沒想到要洗清自己的汙名竟會比登天還難。



Protecting your identity

- Identity theft is becoming far more common in our rapidly changing world. Identity thieves use key pieces of your personal information – such as your social insurance number, driver's licence number and/or credit card numbers – and use them along with your name, address and phone number to make purchases, take out loans or apply for credit cards. They may physically steal important documents, or they may find out your personal information in other ways, without your knowledge.
- The following strategies can help protect you from identity theft.
 - Be careful of sharing personal information
 - Use appropriate security measures
 - Check your statements for accuracy
 - Guard your cards, cheques and ID

Creating Strong Passwords

- **Personal information**

- Avoid using any part of your first or last name, your family members' names, phone number, street address, license plate number, Social Security number, or birth date.

- **Length**

- Use at least eight characters.

- **Difficulty**

- Use a variety of uppercase and lowercase letters, numbers, punctuation, and symbols. Select characters located on different parts of the keyboard, not the ones you commonly use or that are adjacent to each other. Criminals use software that converts common words to symbols, so changing the word, two, to the numeral, 2, or the word, and, to the ampersand symbol, &, is not likely to foil a thief.

Creating Strong Passwords

- **Modify**
 - Change the password frequently, at least every three months.
- **Variation**
 - Do not use the same password for all accounts. Once criminals have stolen a password, they attempt to use that password for other accounts they find on your computer or mobile device, especially banking websites.
- **Passphrase**
 - A **passphrase** (Similar to a password; several words separated by spaces.) , which is similar to a password, consists of several words separated by spaces. Security experts recommend misspelling a few of the word and adding several numerals.
 - For example the phrase, “Create a strong password,” could become the passphrase, “Creaet a strang pasword42.”

Creating Strong Passwords

- **Common sequences**
 - Avoid numbers or letters in easily recognized patterns, such as “asdfjkl;,” “12345678,” “09870987,” or “abcdefg.” Also, do not spell words backwards or use common abbreviations.
- **Test**
 - Use online tools to evaluate password strength.

Digital Safety and Security

- Health Concerns
 - 身體上的傷害
 - 行為上的影響
 - Technology addiction
電腦成癮
 - Technology overload
科技超載
- Environmental Issues
 - **e-waste**
 - 對生態環境的影響

Digital Safety and Security

- **Green computing** involves reducing the electricity consumed and environmental waste generated when using a computer
綠色運算包含減少使用電腦時消耗的電力和產生的環境廢棄物
- Strategies include:
 - Recycling 資源回收
 - Regulating manufacturing processes 規範製造過程
 - Extending the life of computers 延長電腦使用壽命
 - Immediately donating or properly disposing of replaced computers 把要淘汰的電腦立刻捐出或適當回收

How Can You Contribute to Green Computing?



**GREEN
COMPUTER**

How Can You Contribute to Green Computing?

1. Do not leave a computer or device running overnight.
2. Turn off your monitor, printer, and other devices when you are not using them.
3. Use energy efficient hardware.
4. Use paperless methods to communicate.
5. Recycle paper and buy recycled paper.
6. Recycle toner, computers, mobile devices, printers, and other devices.
7. Telecommute.
8. Use videoconferencing and VoIP for meetings.

Programs and Apps

- **Software**, also called a **program**, tells the computer what tasks to perform and how to perform them

軟體 又稱為程式，用來告訴電腦該做什麼，以及該怎麼做



System Software

- Operating system
- Utility program



Application Software

- Desktop app
- Web app
- Mobile app

Programs and Apps

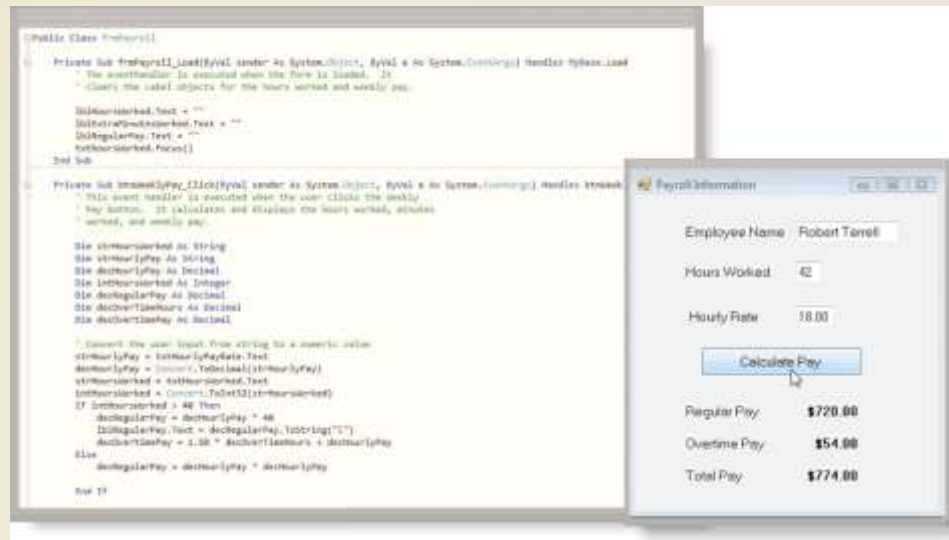
- system software
 - **Operating System (OS)** is a set of programs that coordinates all activities among computer hardware devices
作業系統是一組用來協調電腦硬體設備之間所有活動的程式
 - **Utility Programs** allow the user to perform maintenance-type tasks usually related to managing a computer, its devices or its programs
公用程式可讓使用者藉由它執行系統維護類型的工作，通常與管理電腦、周邊設備、或程式等有關

Programs and Apps

- **Installing** is the process of setting up software to work with the computer, printer, and other hardware
- Once installed, you can run an application so that you can interact with it
- You interact with a program or application through its user interface

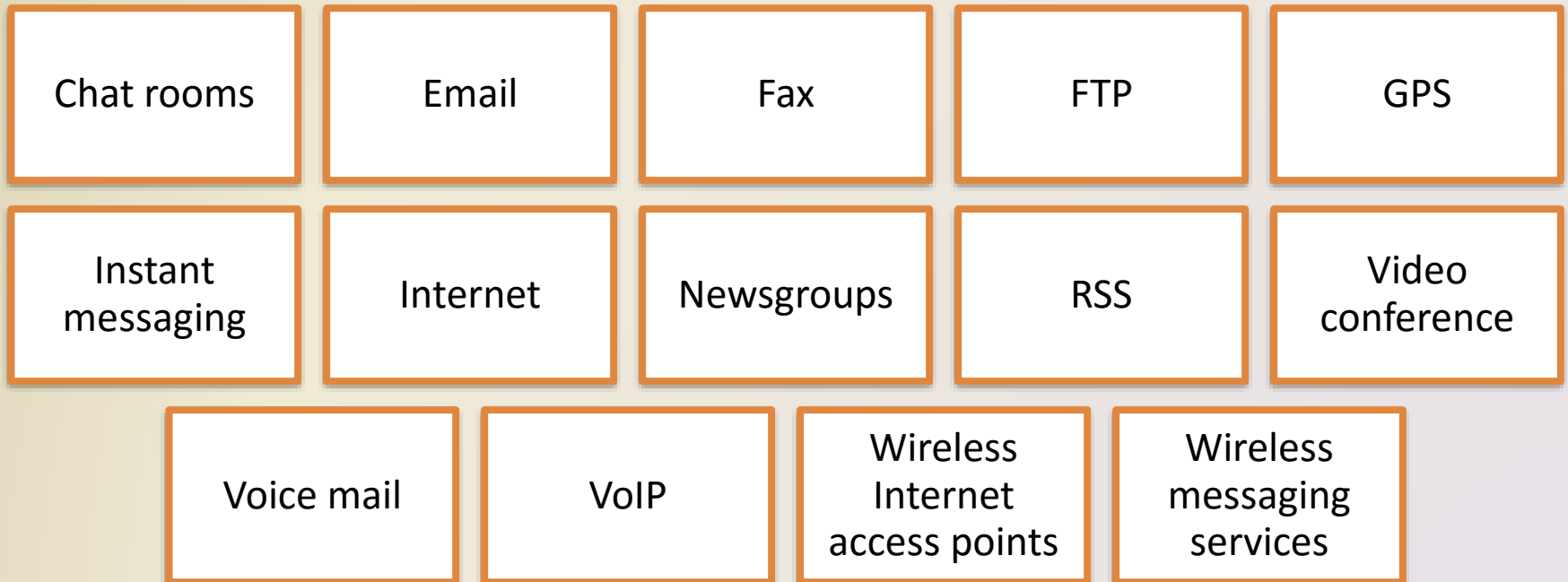
Programs and Apps

- A **software developer**, sometimes called an application developer or computer programmer, is someone who develops programs and apps or writes the instructions that direct the computer or mobile device to process data into information



Communications and Networks

- In the course of a day, it is likely you use, or use information generated by, one or more of these communications technologies



Communications and Networks

- A **communications device** is hardware capable of transferring items from computers and devices to transmission media and vice versa
種能夠讓電腦之間互相傳送及接收資料、指令、及資訊的硬體元件



Communications and Networks

- Communications occur over cables, telephone lines, cellular radio networks, satellites, and other transmission media

透過纜線、電話線、蜂巢式無線電網路、衛星、或其他傳輸媒介進行通訊傳遞

- Examples of wireless communications technologies include:

Wi-Fi

Bluetooth

Cellular radio
蜂巢式無線電

Cellular radio 蜂巢式無線電

- **蜂巢式無線電(Cellular Radio)**是一種移動的無線電話服務技術，它利用位在公眾通信系統上的接收器與發送器促使個人在汽車上或一般地面的交通工具上使用無線電話服務。
- 此種通訊服務能力與一般電話系統一樣，可與全球各地的電話網路系統用戶連接通話。
- 此種移動通訊服務，係藉著將區域畫分成許多小的地區或格(Cell)，每一小地區或小格，有其自己的傳送站，利用複雜的電腦技術，自動將呼叫者由一個無線電頻率移轉至另一個無線電頻率上，以擴充其行動電話服務。當呼叫者由一格移轉至另一格區域上，行動電話可攜帶在汽車上、或在家或辦公室或步行到街上時使用。
- 蜂巢式無線電這種型態的通訊技術基礎是由美國貝爾(Bell)實驗室所開發的、於1971年提交美國聯邦通信委員會 (Federal Communication Commission，簡稱 FCC) 認可。
- 一般的公眾電話系統方可由蜂巢式無線電來運作。

Communications and Networks

- What is a **communications device**(通訊設備)?
 - Hardware component that enables a computer to **send and receive** data, instructions, and information
種能夠讓電腦之間互相傳送及接收資料、指令、及資訊的硬體元件

Using Public Wi-Fi Hot Spots Safely

- **Avoid typing passwords and financial information.**
- **Sign out of websites.**
- **Disable your wireless connection.**
- **Do not leave the computer unattended.**
- **Beware of over-the-shoulder snoopers.**
 - The person sitting behind you may be watching or using a camera phone to record your keystrokes, read your email messages and social networking posts, and view your photos and videos.

Communications and Networks

- A **network** is a collection of computers and devices connected together via communications devices and transmission media

是指將一群電腦及裝置，透過通訊設備及傳輸媒體連線在一起（經常是以無線方式）的集合



Communications and Networks

- 使用網路的好處
 - 分享資源節省時間與金錢



Communications and Networks

Server 伺服器

- A server controls access to resources on a network
- 伺服器可控制對網路上資源的存取

Client 用戶端

- Clients, or workstations, request resources from the server
- 用戶端或工作站向伺服器要求資源



Communications and Networks

Home Networks

- Connect to the Internet
- Share a single high-speed Internet connection
- Access photos, music, videos, and other content
- Share devices
- Play multiplayer games
- Connect game consoles to the Internet
- Subscribe to and use VoIP

Business Networks

- Facilitate communications
- Share hardware
- Share data, information, and software

Uses of Technology in Society

Education

Government

Finance

Retail

Entertainment

Health Care

Travel

Science

Publishing

Manufacturing

Technology Users



Home User



Small/Home
Office User



Mobile User



Power User



Enterprise User

Technology Users



Home User家庭使用者

- Personal financial management
- Web access
- Communications
- Entertainment



Small Office/Home Office User

小型/家庭辦公使用者

- Look up information
- Send and receive e-mail messages
- Make telephone calls



Mobile User行動使用者

- Connect to other computers on a network or the Internet
- Transfer information
- Play video games
- Listen to music
- Watch movies

Examples of Computer Usage



Power User 高階使用者

- Work with multimedia
- Use industry-specific software



Enterprise User 企業使用者

- Communicate among employees
- Process high volumes of transactions
- Blog

Chapter Summary

Basic computer
concepts

Various methods
for input, output,
memory, and
storage

The Internet

Digital security and
safety risks and
precautions

Uses of technology
applications in
society