# CITW Review

# Chapter 1 The Internet

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

**A network of networks**

Users access the Internet for Communication, Health, News, Shopping, Education用户上网是为了交流、健康、新闻、购物、教育

**ARPANET**

(Advanced Research Projects Agency Network)

Internet originated as ARPANET in September 1969

Two main goals

1. To allow scientists at different locations to share information让科学家在不同的地方分享信息
2. To function if part of network were disabled 如果网络的一部分被禁用，它就会起作用

|  |  |
| --- | --- |
| Connecting to The Internet | |
| Wired connections | computers are physically attached via cable/wire to a communications device计算机通过电缆/电线与通信设备相连 |
| Wireless Connections | Computers without communications device use wireless modem or other communications device that enables wireless connectivity没有通信设备的计算机使用无线调制解调器或其他能够实现无线连接的通信设备 |
| Broadband宽带 | signals that use wide range of frequencies. It’s high-speed Internet access that is always on and faster than dial-up access使用广泛频率范围的信号。它是高速互联网接入，总是开着，而且比拨号上网快 |
| Internet Backbone骨干 | major carriers of network traffic on the Internet互联网上网络流量的主要载体 |
| Hotspot | wireless network that provides Internet connections to mobile computers and devices为移动计算机和设备提供因特网连接的无线网络 |

**Six steps for home user to visit internet:**

1. Send a request

2. A cable modern transfers the computer's digital signals to the cable television line in your house.现代电缆将计算机的数字信号传输到你家的有线电视线路。

3. Your request travels through cable television lines to a central cable system, which is shared by up to 500 homes in a neighbourhood. 您的请求将通过有线电视线路传输到一个中央有线系统，该系统由一个社区内多达500个家庭共享。

4. The central cable system sends your request over high-speed fiber-optic lines to the cable operator, who often is the ISP. 中央电缆系统通过高速光纤线路将您的请求发送给电缆运营商，后者通常是ISP。

5. ISP routes your request through the internet backbone to the destination server. ISP将您的请求通过互联网主干路由到目标服务器。

6.The server retrieves the requested webpage and sent it back through the internet backbone to your computer. 服务器检索所请求的网页，并通过互联网主干将其发送回您的计算机。

**IP Address and Domain Name**

IP (Internet Protocol) address - numbers that uniquely identify the location of each computer or device connected to the Internet or any other network唯一标识连接到Internet或任何其他网络的每台计算机或设备的位置的数字

Domain name域名**-** text-based name that corresponds to the IP address对应于IP地址的基于文本的名称

DNS (Domain Name Server) **-** translates domain name to its IP address (域名服务器)-翻译域名到它的IP地址

Uniform Resource Locator统一资源定位符

URL - Unique address for a webpage and also is a special form of individual address of a certain resource on the Internet. It can refer to the website, some particular document, or an image. URL—网页的唯一地址，也是Internet上某一资源的特定地址的一种特殊形式。它可以指的是网站，一些特定的文件，或图像。

**Hyperlink and HTTP**

Hyperlink – built-in connection to other documents, graphics, audio, video, webpages and websites超链接-内置连接到其他文件，图形，音频，视频，网页和网站

HTTP (Hypertext Transfer Protocol) - set of rules that defines how webpages transfer on the Internet. (超文本传输协议)——定义网页在互联网上如何传输的一组规则。

HTTPS (Hypertext Transfer Protocol Secure)- and indicates that information transmitted over HTTP is encrypted and secure.  (超文本传输安全协议)表示通过HTTP传输的信息是加密和安全的。

Internet Service Provider (ISP) – business that provides individuals and organizations access to the Internet互联网服务供应商(ISP) -提供个人和组织访问互联网的业务

**File Transfer Protocol**

FTP (File Transfer Protocol) - Internet standard that permits file uploading and downloading to and from other computers on the Internet FTP(文件传输协议)-允许文件上载和从因特网上的其他计算机下载的因特网标准

FTP server- computer that allows users to upload and/or download files using FTP允许用户使用FTP上传和/或下载文件的计算机

**Electronic Commerce（EC）**电子商务

Business transaction that occurs over the Internet发生在互联网上的商业交易

Other Internet Services

Internet messaging services互联网信息服务communications services that notify you when your contacts are online, allowing you to join a private chat room with them当您的联系人在线时通知您的通信服务，允许您与他们一起加入一个私人聊天室

Chat聊天 - real-time typed online conversationthat takes place on a computer or mobile device with other users在电脑或移动设备上与其他用户进行的实时在线对话

Chat room - website or application that permits users to chat with others who are online at the same time允许用户与同时在线的其他人聊天的网站或应用程序

Chat Client **-** program that connects you to a chat server将您连接到聊天服务器的程序

VoIP (Voice over IP)- enables users to speak to other users via their Internet connection使用户可以通过Internet连接与其他用户对话

Netiquette **-** code of acceptable Internet behavior users should follow while on the Internet用户上网时应遵守的网络行为规范

# Chapter 2: Computer Applications in Society

|  |  |
| --- | --- |
| **Education (traditional and modern-examples)** | |
| Traditional Learning system/ Model | Modern Learning System/Model |
| people learn from other people e.g. parents, teachers, employers using printed material like books, manuals人们向其他人学习，比如父母、老师、雇主，使用书籍、手册等印刷材料 | educators use computers to aid education. Schools and organizations equip labs and classrooms with computers教育工作者使用电脑来辅助教育。学校和组织为实验室和教室配备电脑 |

**Banking and Finance and examples**

Computers play a significant role in handling all of the world's money and used to manage finances电脑在处理世界上所有的钱和管理财务方面扮演着重要的角色

**Examples**：

Finance Software – Balance Cheque Books, Pay Bills, Track Personal Income and Expenses, Manage Investments and Evaluate Financial Plans财务软件-平衡支票簿，支付帐单，跟踪个人收入和费用，管理投资和评估财务计划

Online Banking – users can access account balances, pay bills, track monthly transactions from their bank’s computer right to their PCs网上银行-用户可以访问帐户余额，支付账单，跟踪每月的交易从银行的电脑权利到他们的个人电脑

Online Investing – buy and sell stocks and bonds without a broker在线投资——在没有经纪人的情况下买卖股票和债券

Digital currency - When depositing money in a bank it is stored as a digital record. A computer keeps track of how much money is in your account. 数字货币——当你把钱存入银行时，它会被存储为数字记录。电脑记录你的账户里有多少钱。

**Government and examples**

Government provides society with direction by making and administering policies 政府通过制定和管理政策为社会提供方向

Governments have Web sites to provide up-to-date information政府有网站提供最新的信息

**Examples**:

Services – Income tax, permits and licenses, parking tickets, report crimes, vehicle registration renewal服务-所得税，许可证和执照，停车罚单，举报犯罪，车辆登记续期

In the USA– computers are used to man 911 centers for medical emergencies, fire, police在美国，电脑被用于911急救中心，火灾，警察

E-Government improves efficiency and ICTs help improve efficiency in mass processing tasks and public administration operations. 电子政府提高效率，而资讯及通讯科技有助提高处理大量工作和公共行政运作的效率。

**Health Care and examples**

Most areas of health care use computers e.g. regular checkup, lab work, outpatient test, emergency surgery医疗保健的大部分领域都使用电脑，例如定期检查、实验室工作、门诊测试、紧急手术

Hospitals use computers and mobile devices to maintain and access patient records 医院使用计算机和移动设备来维护和访问患者记录

Computers monitor patients’ vital signs in hospitals, homes电脑监控病人在医院和家里的生命体征

Robots deliver medication to nurse stations in hospitals机器人把药物送到医院的护士站

Computers and computerized devices assist doctors, nurses, technicians with medical test计算机和计算机设备帮助医生、护士、技术人员进行医学测试

Doctors use the Web and medical software to assist with researching and diagnosing health conditions医生使用网络和医疗软件来帮助研究和诊断健康状况

Doctors use email to correspond with patients医生用电子邮件与病人通信

Surgeons implant computerized devices e.g. pacemakers allowing heart patients to live longer 外科医生植入计算机设备，如心脏起搏器，使心脏病人活得更长

Long distance health care: telemedicine and telesurgery远程医疗:远程医疗和远程手术

Telemedicine – Health care professionals in separate locations conduct live conferences on the computer远程医疗-在不同地点的卫生保健专业人员在计算机上进行实时会议

**Example:**

To discuss bone X-ray through live images from each doctor’s computer 通过每位医生电脑上的实时图像来讨论骨x线

Telesurgery – Called Remote Surgery远程手术——称为远程手术

Surgeon performs surgery on a patient not physically located in the same room as the surgeon外科医生为不在同一房间的病人做手术

Surgeons direct robots to perform surgery via computers connected to a high-speed network外科医生引导机器人通过连接到高速网络的计算机进行手术

**Science and examples**

All branches of science from biology to astronomy use computers to collect, analyze, model data从生物学到天文学的所有科学分支都使用计算机来收集、分析和建模数据

Breakthroughs in surgery, medicine and treatments often result from scientists’ use of computers外科、医学和治疗方面的突破往往是科学家使用计算机的结果

**Example:**

Tiny computers imitate functions of the central nervous system, retina, cochlear e.g. a cochlear implant aids a deaf person to hear微型计算机模拟中枢神经系统、视网膜、耳蜗的功能。例如，人工耳蜗帮助失聪的人听

Electrodes implanted in the brain stop Parkinson Disease’s tremors, cameras small enough to swallow, called camera pill, take pictures inside the body to detect polyps, cancer and abnormalities植入大脑的电极可以阻止帕金森氏症(Parkinson Disease)患者的震颤，这种摄像机体积小到可以吞咽，被称为“照相药丸”(camera pill)，可以在体内拍照，检测息肉、癌症和异常情况

Neural Network 神经网络 system that attempts to imitate human brain behavior. Scientists create neural networks by connecting thousands of processors similar to how brain neurons are connected. The capability of a PC to recognize spoken words is a direct result of scientific experimentation with neural networks 试图模仿人类大脑行为的系统。科学家通过连接数千个处理器来创建神经网络，就像大脑神经元是如何连接的一样。计算机识别口语单词的能力是神经网络科学实验的直接结果

**Publishing and examples出版和例子**

Publishing – process of making words available too public i.e. books, magazine, newspapers, film, video出版-使文字过于公开的过程，如书籍、杂志、报纸、电影、录像

Special software assist 特殊的软件帮助

* graphic designers to develop pages that include text, pictures, graphics•图形设计师开发包含文本、图片、图形的页面
* artists to compose songs•艺术家创作歌曲
* filmmakers in creating and editing films•电影制作人创作和编辑电影

**Examples:**

Adobe In Design, Microsoft Publisher, QuarkXPress, Serif Page Plus, and Scribus

**Embedded computer and examples**

Embedded computer- special-purpose computer that functions as a component in a larger product嵌入式计算机-特殊用途的计算机，作为一个更大的产品的一个组成部分

* Consumer electronics 消费类电子产品
* Home automation devices 家庭自动化设备
* Automobiles 汽车
* Process controllers and robotics 过程控制器和机器人
* Computer devices and office machines 计算机设备和办公设备

**Examples:**

1. Weather forecast – researchers envision an umbrella with embedded cell phone in the handle that will dial and download weather forecast 天气预报——研究人员设想一种雨伞，伞柄上嵌入手机，可以拨打和下载天气预报

The handle will glow green for good weather and flash red for imminent storms手柄在天气好的时候会发出绿光，在暴风雨即将来临的时候会发出红光

2. Wearing hidden embedded computers can help the elderly and people recovering from accidents and surgeries to monitor their walking stride and pace 佩戴隐藏的嵌入式电脑可以帮助老年人和从事故和手术中康复的人监测自己的行走步幅和速度

When steps are uneven, embedded computer will sound a warning to prevent a fall当台阶不平时，嵌入式计算机会发出警告，防止摔倒

3. Embedded computers woven into clothing can monitor heart and breathing rates嵌入衣服的电脑可以监测心脏和呼吸频率

# Chapter 3: Human Aspects of Computing

**Human Computer Interface (HCI)**

In daily life, we use and interact with various devices/ machines/systems to fulfill a task: 在日常生活中，我们使用各种设备/机器/系统来完成一项任务，并与之交互:

Computer, Mobile phones, Car, Vending Machine 电脑，手机，汽车，自动售货机

Human Computer Interface (HCI) 人机界面concerned with the design, evaluation and implementation of the interaction of computing systems for human use关注人类使用的计算系统的交互的设计、评价和实现

HCI

* Describes the interaction between a user and a computer描述用户和计算机之间的交互
* Designing computer systems that设计计算机系统
* Support people to carry out their activities productively and safely支持人们有效和安全地开展他们的工作

Computer any technology ranging from the general desktop to a large scale computer system, a process control or an embedded system从一般桌面到大型计算机系统，过程控制或嵌入式系统的任何技术

Computer not just the PC but also devices like photocopiers, microwave, GPS (computerized)不仅仅是PC，还有复印机，微波炉，GPS（计算机化）等设备

Interaction 交互communication between user and computer用户和计算机之间的通信

**Importance of HCI**

Concerned with the user performance human factors and Ergonomics执行与用户相关的人为因素和人体工程学

Produce usable, safe and functional system生产可用，安全和功能的系统

Safety  安全

Effectiveness (do the right thing) 有效性（做正确的事）

Efficiency (do things in right way) 效率（用正确的方法做事）

Usability (ease of use and learnability)    可用性（易用性和可学习性）

Learnability 可学习性– how a system supports the user's efforts to learn how a system works系统如何支持用户学习系统如何工作的努力

Simplicity简单

**Emerging technology and examples**新兴技术与实例

Technology - process of transforming basic knowledge into a useful application将基础知识转化为有用的应用程序的过程

Emerging Technologyare those where:新兴技术是：

* knowledge base is expanding知识库正在扩大
* applications in existing industries are undergoing innovation e.g. handphones现有行业的应用正在进行创新，例如：手提电话
* new industries are being tapped正在挖掘新的产业

Example: Brain-controlled Computers, Genome Editing, 3-D Metal Printing, Artificial Embryos 示例：脑控计算机，基因组编辑，三维金属打印，人工胚胎

**Health concerns of Computer use and 6 types**

* Computer vision syndrome计算机视觉综合症(CVS) eye and vision problems眼睛和视力问题

1. Digital Eye Strain数字眼睛疲劳refers to a group of related **eye** and **vision problems** that result from extended **computer** use. 数字眼睛疲劳是指由于延长计算机使用而产生的一组相关的眼睛和视力问题。

* Repetitive strain injury重复性劳损（RSI）

1. Wrist, hand, arm and neck injuries as a result of forced muscle groups through fast, repetitive motions. 通过快速重复动作强迫肌肉群导致手腕，手，手臂和颈部受伤.
2. Typing on a keyboard-based device (computer, musical instrument). 在基于键盘的设备上键入(计算机，乐器).
3. Moving groceries items over a scanner. 将杂货物品移到扫描仪上
4. Preventive measure: change technique of operating the instruments, take a rest. 预防措施：改变操作仪器的技术，休息一下

* Computer addiction计算机成瘾when computer consumes entire social life - 当计算机消耗整个社交生活
* Carpal tunnel syndrome腕管综合征(CTS)inflammation of nerve that connects forearm to palm连接前臂与手掌的神经炎症

1. Take frequent breaks during computer session在计算机会话期间经常休息
2. Use wrist rest使用腕托
3. Exercise hands   
   and arms锻炼手和手臂
4. Minimize the number of times you switch between mouse and keyboard4.尽量减少在鼠标和键盘之间切换的次数

* Back & Neck Pains

1. Possible cause: 可能的原因：
2. Improper use of chairs椅子使用不当
3. Improper ways of positioning keyboard and/or display screen键盘和/或显示屏定位方式不正确
4. Preventive measure: use adjustable, special-purpose furniture预防措施：使用可调节的专用家具

* Electromagnetic Fields电磁场（EMF）

1. Waves of electrical and magnetic energies generated by electrical devices电气设备产生的电能和磁能的波动
2. Strongest fields are emitted from the sides and backs of terminals and CRT display screens从终端和CRT显示屏的侧面和背面发射最强的场

**Ergonomics, examples and reasons**

Ergonomics 人体工程学 originates from two Greek words: *ergon (*work) and *nomoi (*natural laws) 起源于两个希腊词：ergon（work）和nomoi（自然法则）

It means the science of work and a person’s relationship to that work它意味着工作科学和一个人与该工作的关系

Ergonomics is sometimes defined as the science of fitting the work to the user instead of forcing the user to fit the work人体工程学有时被定义为将工作适合用户而不是强迫用户适应工作的科学

Applied science devoted to comfort, efficiency and safety in workplace应用科学致力于创造舒适，高效和安全的工作场所

Ergonomics goal：

provide maximum productivity with minimal cost以低成本提供最高生产力

in this context，cost is expressed as the physiological or health cost to the worker在这里成本代表员工生理上的成本和健康成本

# Chapter 4: Ethical and Legal Issues

**Ethical vs Legal**

Ethical standards are based on the human principles of right and wrong. The differences between them are these: 伦理标准是建立在人类的是非原则之上的。

Legal standards are based on written law, while ethical standards are based on human rights and wrongs. 法律标准基于成文法律，而道德标准基于人权和错误。

**Computer Ethics (6) and prevent记最少5个**

Unauthorized use of computers and networks未经授权使用计算机和网络

Software theft软件盗窃

Codes of conduct进行加密

Intellectual property rights知识产权—rights to which creators are entitled for their work创作者对其作品享有的权利

Information accuracy信息的准确性

Information privacy信息隐私

**Hacker**

**(**never intentionally damage data**)不故意破坏数据**

Hacker - accesses a computer or network illegally.非法访问计算机或网络。

**Cracker黑客**

Cracker – one who accesses a computer or network illegally with the INTENTION of destroying, stealing data非法进入计算机或网络，意图破坏、窃取数据的人

**License Agreement许可协议**

Right to use a software

Single-user license agreement allows user to install software on one computer单用户许可协议允许用户在一台计算机上安装软件

prevent hardware theft and vandalism

1. Installation and use of **Alarm Systems** that go off when someone enters a room.
2. **Real Time Location Systems (RTLS)** for high-risk or high-value items, as it allow the user to always know the whereabouts of their hardware. This, however, is an expensive form of protection, thus it is usually used by organizations with hardware to protect.
3. **Mini-security systems** for mobile devices, such as a shutting down of the device or sounding an alarm if the device moves outside a certain distance.
4. Implementing the require of a **Password**Or**Biometrics**, to unlock mobile devices. Unfortunately this technique only prevents theft of the device to be useless to the thieves. It does not guard against vandalism.
5. **Physical Security Devices**, such as cables, that allow a user to lock their equipment to a desk, drawer or even the floor. This does not prevent vandalism though unfortunately.

**Safeguarding维护**

Safeguarding your computers requires protecting your hardware against damage or theft, protecting computer systems against malware and protecting valuable data from being accessed by unauthorized personnel or stolen by disgruntled staff. 保护您的计算机需要保护您的硬件不受损害或盗窃，保护计算机系统不受恶意软件攻击，保护有价值的数据不被未经授权的人员访问或不满的工作人员窃取。

**Business Software Alliance (BSA)** **商业软件联盟**

Business Software Alliance (BSA) promotes better understanding of software piracy problems(BSA)促进更好地了解软件盗版问题

**Business Software Alliance商业软件联盟**

A nonprofit trade association to advance the goals of the software industry 一个促进软件行业发展目标的非营利行业协会

Dedicated to promoting a SAFE AND LEGAL digital world. 致力于促进一个安全和合法的数字世界。

Goals of BSA:

* Protecting intellectual property (copyright, patents, technology mandates) 保护知识产权(版权、专利、技术授权)
* Opening markets to barrier-free trade开放自由贸易市场
* Data security数据安全

**Anonymizer网管**

Proxy server that makes Internet activity untraceable. 使互联网活动无法追踪的代理服务器。

Protects by hiding user’s private information通过隐藏用户的私人信息进行保护

When users anonymize their personal information, it can enable: 当用户匿名化他们的个人信息时，它可以:

* Risk minimization风险最小化
* Taboo electronic communications禁用电子通讯
* Identity theft prevention防止身份盗窃
* Protection of search history搜索历史的保护

**Cookie档案记录**

Small file on your computer that contains data about you在你的计算机上包含关于你的数据的小文件

Some Web sites sell or trade information stored in your cookies有些网站出售或交易存储在cookie中的信息

Set browser to accept cookies, prompt you to accept cookies, or disable cookies设置浏览器接受cookies，提示您接受cookies，或禁用cookies

User preferences用户首选项

How regularly you visit Web sites你多久访问一次网站

Interests and browsing habits兴趣及浏览习惯

**Cookie Manager**

Software program that selectively blocks cookies有选择地阻塞cookie的软件程序

**Spyware间谍软件**

Program placed on computer without user’s knowledge在用户不知情的情况下放在计算机上的程序

Secretly collects information about the user秘密收集用户的信息

Spam - unsolicited 垃圾邮件——主动

e-mail message sent to many recipients发送给许多收件人的电子邮件

Software that performs certain behaviors without obtaining consent, such as: 未经许可而执行某些行为的软件，例如:

Advertising and collecting personal information 广告和收集个人信息

Changing the configuration of your computer改变你的电脑配置

Often associated with adware or software that tracks personal or sensitive information通常与跟踪个人或敏感信息的广告或软件相关联

It can change your computer causing it to slow down/crash, change your web browser's home/search page它可以改变你的电脑，导致它变慢/崩溃，改变你的网页浏览器的主页/搜索页面

**Identity Theft身份盗窃**

Identity Theft - personal details are stolen个人信息被盗

Identity Fraud 身份欺诈when those details are used to commit fraud 当这些细节被用来进行欺诈

**Prevention**

* Tear or shred receipts, credit offers, account statements, expired cards to prevent anyone from stealing your information撕碎收据、信用卡、对账单、过期的卡，防止任何人窃取你的信息
* Store personal information in a safe place at home and at work. Do NOT leave it lying around把个人信息储存在家里和工作中安全的地方。不要把它扔在那里
* Do NOT respond to unsolicited requests for personal information in the mail, phone or online不回应以邮件、电话或网上方式索取个人资料的要求
* Install firewalls and virus-detection software on your home computer在你的家用电脑上安装防火墙和病毒检测软件
* Check your credit report once a year, more frequently if you suspect someone has gotten access to your account information每年检查一次你的信用报告，如果你怀疑有人获得了你的账户信息，要更频繁地检查
* Protect your PIN. Never write a PIN on a credit/debit card or on a slip of paper kept in your wallet保护你的密码。不要在信用卡或借记卡上或钱包里的纸条上写个人密码

**Phishing网络钓鱼**

Phishing - email fraud method where the perpetrator sends out official looking email attempting to gather personal and financial information from recipients电子邮件欺诈的方法，犯罪者发送正式的电子邮件试图收集个人和财务信息的收件人

As these e-mails look legitimate, people trust them and enter their personal information由于这些电子邮件看起来是合法的，人们信任它们并输入他们的个人信息

Phishing filter钓鱼过滤program that warns and blocks one from potentially fraudulent or suspicious websites一个程序用于发出警告和阻止潜在的欺诈或可疑的网站

**Spoofing**

Spoofing 电子欺骗when you type a website it re-directs to a fake website that looks legitimate 当你输入一个网站，它会重定向到一个看起来合法的假网站

**Pharming**

Pharming 网址嫁接– similar to phishing only the perpetrator does it via spoofing类似于钓鱼，只有犯罪者通过欺骗

**Personal Data Protection Laws**

Law that comprises rules governing the collection, use, disclosure and care of personal data 包括规管收集、使用、披露及照顾个人资料的规则的法例

Recognises both the rights of individuals to protect their personal data, including rights of access and correction, and the needs of organisations to collect, use or disclose personal data for legitimate and reasonable purposes确认个人有权保障其个人资料(包括查阅及改正个人资料的权利)，以及机构有需要为合法及合理的目的收集、使用或披露个人资料

**Objective**

1. Vast amounts of personal data are collected, used, transferred to third party organisations for different reasons e.g. Facebook由于不同的原因(如Facebook)，大量的个人数据被收集、使用、转移到第三方组织

2. Such trends causes concerns on how one’s personal data is used这些趋势引起了人们对个人数据使用方式的关注

3. Hence, a data protection regime aims to govern the collection, use, disclosure of personal data to maintain one’s trust in organisations that manage their data因此，保障资料制度旨在规管个人资料的收集、使用和披露，以维持个人对管理其资料的机构的信任

**How Does it Work**

Ensures a standard of protection for personal data across the economy by complementing sector-specific legislative and regulatory frameworks透过与特定行业的立法和规管架构相辅相成，确保整个经济体系的个人资料保障水平

This means organisations will have to comply with the Personal Data Protection Law, common law and other relevant laws in the specific industry when handling personal data in their possession 这意味着机构在处理其持有的个人资料时，必须遵守个人资料保护法、普通法及个别行业的其他有关法例

**Basic Concepts**

Consent 同意– Organisations may collect, use or disclose personal data only with the individual's knowledge and consent 机构只可在个人知悉及同意的情况下收集、使用或披露个人资料

Purpose 目的– Organisations may collect, use, disclose personal data in an appropriate manner and only if they have informed the individual of purposes for the collection, use, disclosure机构只有在告知个人收集、使用及披露个人资料的目的后，才可以适当方式收集、使用及披露个人资料

Reasonableness 合理– Organisations may collect, use, disclose personal data only for purposes that would be considered appropriate to a reasonable person in the given circumstances -各机构只可收集、使用、披露个人资料作在特定情况下会被认为适当的用途

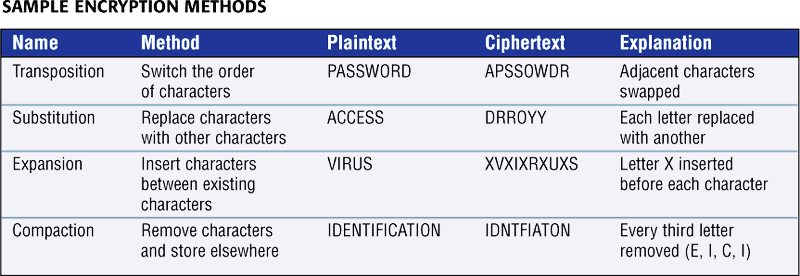
**Encryption and four methods 加密的四种方法**

Safeguards against information theft防止信息失窃的保障措施

Process of converting plaintext (readable data) into ciphertext (unreadable characters)将明文(可读数据)转换为密文(不可读字符)的过程

Encryption key (formula) uses more than one method加密密钥(公式)使用不止一种方法

To read the data, recipient must decrypt the data要读取数据，接收方必须解密数据

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# Chapter 5: Enterprise Computing

**Enterprise**

Enterprise is simply defined as business organization企业被简单地定义为业务组织Large organization such as multinational corporation, university, hospital, research laboratory or government organizations大型组织，如跨国公司，大学，医院，研究实验室或政府组织why？Requires special computing solutions because of its size由于它的大小，需要特殊的计算解决方案

**Enterprise Computing (4)**

Network Protocol 网络协议- Mechanisms for devices to identify and connect with each other, including formatting rules that specify how data is packaged, messages are sent and received e.g. TCP/IP设备之间识别和连接的机制，包括指定如何打包数据、发送和接收消息的格式规则

Network Architecture网络结构– network layout, consisting of hardware, software, connectivity, communication protocols, mode of transmission e.g. wired or wireless -网络布局，包括硬件、软件、连接、通信协议、传输模式，如有线或无线

Information Architecture信息系统- Set of hardware, software, data, people and procedures that work together to produce information. E.g. instructions to accomplish activities硬件、软件、数据、人员和程序的集合，共同工作以产生信息。完成活动的指示

Information architecture 信息体系结构document would become the foundation for *information planning*, to provide a common framework for the cost-effective sharing of data across the different organizational units taking care of the security and privacy of the specific information. 文档将成为信息规划的基础，从而为跨不同组织单位的具有成本效益的数据共享提供一个通用框架，以确保特定信息的安全和隐私。

**Four Categories of Users**

Executive management strategic decisions执行管理战略决策

Middle management tactical decisions中层管理战术决策

Operational management operational decisions运营管理运营决策

Non-management employees on-the-job decisions 非管理层员工在职决策

**Four Management Activities**

Planning objectives strategies tactics规划目标策略策略

Organizing money, people management structure组织资金，人员管理结构HR

Leading communications instructions motivation领导沟通指示动机

Controlling performance measurement corrective action控制性能测量和纠正措施

**Type of information system (9)**

Human Resource Information System (HRIS) 人力资源资讯系统

* Manages Human Resource functions管理人力资源职能
* Employee relationship management (ERM) system facilitates communication with employees员工关系管理(ERM)系统便于与员工沟通

Marketing Information System营销信息系统

* Software tools designed to support marketing decision making and allow marketers to gather information around-the-clock and preserve, analyze, evaluate, update and distribute information relevant to specific products, services or promotions. Market research system analyzes data gathered from surveys为支持市场决策而设计的软件工具，允许营销人员24小时收集信息，并保存、分析、评估、更新和分发与特定产品、服务或促销相关的信息。市场调查系统分析从调查中收集的数据

Enterprise Resource Planning (ERP) 企业资源规划

* Enterprise resource planning (ERP) is business process management software that allows an organization to use a system of integrated applications to manage the business and automate many back-office functions related to technology, services and human resources. 企业资源规划(ERP)是一种业务流程管理软件，允许组织使用集成应用系统来管理业务并自动化与技术、服务和人力资源相关的许多后台办公功能。
* ERP software typically integrates all facets of an operation — including product planning, development, manufacturing, sales and marketing — in a single database, application and user interface. ERP软件通常在一个数据库、应用程序和用户界面中集成操作的所有方面——包括产品规划、开发、制造、销售和营销。

Computer Aided Design (CAD) 计算机辅助设计

* Uses special software to aid in product design, drafting, engineering e.g view single/multiple layers of an airplane’s design使用特殊软件协助产品设计、制图、工程设计。查看飞机设计的单层/多层

Computer-aided Engineering (CAE)计算机辅助工程

* computers to test product designs e.g. test a car design or a bridge before it is built. Simulates effects of wind, weight, temperature on product shapes and materials测试产品设计的计算机，例如在建造前测试汽车设计或桥梁。模拟风、重量、温度对产品形状和材料的影响

Transaction Processing System (TPS) 交易处理系统

* A transaction process system (TPS) is an information processing system for business transactions involving the collection, modification and retrieval of all transaction data. Characteristics of a TPS include performance, reliability and consistency. TPS is also known as transaction as real-time processing. 事务处理系统(TPS)是用于收集、修改和检索所有事务数据的业务事务的信息处理系统。TPS的特性包括性能、可靠性和一致性。TPS也被称为事务和实时处理

Customer Relationship Management (CRM) 客户关系管理

* Manages information about customers, interactions with customers, past purchases, and interests. Mainly used in three departments :管理客户信息、与客户的交互、过去的购买和兴趣。主要用于三个部门:
* Marketing—learns about customers and then designs new products了解客户，然后设计新产品
* Sales—tracks sales process from initial contact through final purchase销售跟踪销售过程，从最初的接触到最终的购买
* Customer service department—tracks ongoing correspondence with customer客户服务部-跟踪与客户的通信

Material Requirements Planning (MRP) 物料需求计划

* MRP - Uses software to monitor and control production processes and is a production planning and inventory control system. 使用软件监控生产过程，是一个生产计划和库存控制系统。
* MRP integrates data from production schedules with that from inventory and the bill of materials (BOM) to calculate purchasing and shipping schedules for the parts or components required to build a product. 将来自生产计划的数据与来自库存和物料清单(BOM)的数据结合起来，以计算制造产品所需的零部件的采购和发货计划。

Management Information System (MIS) 管理信息系统

* A management information system (MIS) is a computerized database of financial information organized and programmed in such a way that it produces regular reports on operations for every level of management in a company. It is usually also possible to obtain special reports from the system easily. The main purpose of the MIS is to give managers feedback about their own performance; top management can monitor the company as a whole. 管理信息系统(MIS)是一种计算机化的财务信息数据库，其组织和编程方式使其能够为公司的每一级管理人员定期提供业务报告。通常也可以很容易地从系统中获得特殊报告。管理信息系统的主要目的是为管理人员提供关于他们自身表现的反馈;最高管理层可以监督整个公司。

Content Management System (CMS) 内容管理系统

* A content management system (CMS) is a software application or set of related programs that are used to create and manage digital content. Organizes and allows access to documents and other files. most CMS systems are now designed exclusively to manage content on the Web. 内容管理系统(CMS)是用于创建和管理数字内容的软件应用程序或相关程序集。组织和允许访问文件和其他文件。现在，大多数CMS系统都是专为管理Web上的内容而设计的。

**E-Retailing Market Store电子商务市场商店**

Retailers use Web to sell products and services零售商利用网络销售产品和服务

Also called e-tail

Merchant account is account set up with credit card company so retailer can accept credit card payments from customers商户帐户是与信用卡公司建立的帐户，零售商可以接受客户的信用卡付款

E-money allows customer to make payment over Internet from cash account  
电子货币允许客户通过网络从现金账户进行支付

**Enterprise-Wise Technology**

Enterprise Storage System 企业存储系统- is a centralized repository for business information that provides common data management and protection, as well as data sharing functions, through connections to numerous computer systems. Designed to assist large organizations with saving and retrieving digital information.是一个集中式的业务信息存储库，通过连接到许多计算机系统，提供公共数据管理和保护以及数据共享功能。旨在帮助大型组织保存和检索数字信息。

# Chapter 6: Digital Security

**Types of Digital Security Risks**

Digital security risk - any event that could cause loss of or damage to a computer or mobile device hardware, software, data, information or processing capability数字安全风险-任何可能导致计算机或移动设备硬件、软件、数据、信息或处理能力损失或损坏的事件

Types of Digital Security Risks: 数字安全风险的类型:

Computer crime **-** any illegal act involving the use of a computer or related devices计算机犯罪-任何涉及使用计算机或相关设备的非法行为

Cybercrime - online or Internet-based illegal act Information transmitted over networks has a higher degree of security risk than information kept in organizations网络犯罪——通过网络传输的网络或基于网络的非法行为信息比保存在组织中的信息具有更高的安全风险

**Malware (4)** **恶意软件(4)**

Spyware is software that is installed on a computing device without the end user's knowledge.间谍软件是安装在终端用户不知情的电脑设备上的软件。

virus designed to spread from host to host and has the ability to replicate itself. 设计用来从一个宿主传播到另一个宿主的病毒，具有自我复制的能力。

Worm copies itself repeatedly, using up resources and possibly shutting down computer or network蠕虫会反复复制自己，消耗资源，可能还会关闭计算机或网络

Trojans a program that appears to be something safe but is performing tasks such as giving access to your computer or sending personal information to other computers. Trojans do not reproduce by infecting other files nor do they self-replicate.  Mostly Trojans are introduced via email attachments. 木马程序看起来是安全的，但正在执行的任务，如访问您的计算机或发送个人信息到其他计算机。木马不会通过感染其他文件进行复制，也不会自我复制。木马程序主要是通过电子邮件附件引入的。

|  |  |
| --- | --- |
| Internet and Network Attacks (3) and how do they attack | |
| Adware广告软件 | A program that displays an online advertisement in a banner, pop-up window, or pop-under window on webpages, email messages, or other Internet services. 在网页、电子邮件或其他互联网服务的横幅、弹出窗口或弹出窗口中显示在线广告的程序。 |
| Ransomware勒索软件 | A program that blocks or limits access to a computer, phone, or file until the user pays a specified amount of money. 阻止或限制对计算机、电话或文件的访问的程序，直到用户支付一定金额的钱为止。 |
| Rootkit隐匿技术 | A program that hides in a computer or mobile device and allows someone from a remote location to take full control of the computer or device.隐藏在计算机或移动设备中的程序，允许远程人员完全控制计算机或设备。 |

Botnet 僵尸网络- group of compromised computers or mobile devices connected to a network连接到网络的受损计算机或移动设备的一组

Zombie PC 僵尸电脑- a computer connected to the Internet that has been compromised by a hacker, computer virus or trojan horse program and can be used to perform malicious tasks of one sort or another under remote direction -连接到互联网的电脑，已被黑客、电脑病毒或特洛伊木马程序入侵，可用于执行各种恶意任务在远程指导下

Denial of service attack (DoS) 拒绝攻击服务- a type of cyber-attack designed to disable, shut down or disrupt a network, website or service.一种网络攻击，旨在禁用、关闭或破坏网络、网站或服务。

Distributed DoS attack (DDoS attack) 分布式DoS攻击–  attack uses multiple infected devices and connections spread around the world as a botnet 攻击使用多个受感染的设备和连接散布在世界各地作为僵尸网络

Back door - program or set of instructions in a program that allow users to bypass security controls (firewall)后门-程序或程序中允许用户绕过安全控制(防火墙)的指令集

**Macro Virus, antivirus, Virus Signature**

Macro virus 宏病毒– A macro virus infects a software program and causes a series of actions to begin automatically when the program is opened. It operates like a normal macro and often installs itself in the place of an existing macro (e.g., word processors and spreadsheet applications). 宏病毒感染一个软件程序，并导致一系列的动作自动开始当程序被打开。它像一个普通的宏一样运行，并且经常在现有宏的位置安装自己(例如，字处理器和电子表格应用程序)。

Antivirus反病毒程序- Identifies and removes computer viruses, worms and Trojan horses识别和删除计算机病毒，蠕虫和特洛伊木马

Virus Signature 病毒签名-Also called virus definition，is a string of characters or numbers that makes up the signature that anti-virus programs are designed to detect. One signature may contain several virus signatures, which are algorithms or hashes that uniquely identify a specific virus.也被称为病毒定义，是一串字符或数字组成的签名，反病毒程序被设计来检测。一个签名可能包含几个病毒签名，这是唯一识别特定病毒的算法或哈希。

Typically, antivirus software uses all three scanning detection processes: 一般而言，杀毒软件会使用所有三种扫描检测程序:

Specific Detection – This works by looking for known malware by a specific set of characteristics. 特定的检测-这是通过寻找已知的恶意软件的一组特定的特征。

Generic Detection – This process looks for malware that are variants of known “families,” or malware related by a common codebase. 通用检测——这个过程寻找的是已知的“家族”的变种恶意软件，或者是由普通代码库相关的恶意软件。

Heuristic Detection – This process scans for previously unknown viruses by looking for known suspicious behavior or file structures.启发式检测——这个过程通过寻找已知的可疑行为或文件结构来扫描以前未知的病毒。

**System Failure系统故障**

**cause原因**

A system failure can occur because of a hardware failure or a severe software issue, causing the system to freeze, reboot, or stop functioning altogether.系统故障可能由于硬件故障或严重的软件问题而发生，导致系统冻结、重新启动或完全停止运行。

**prevention预防(2)**

Protects computer and equipment from electrical power disturbances保护电脑和设备免受电力干扰

Uninterruptible power supply (UPS) - surge protector that provides power during power loss不间断电源(UPS) -浪涌保护器，在断电时提供电源

**Backup**

|  |  |
| --- | --- |
| TYPE | DEFINATION |
| Full backup  完全备份 | a full backup is when every single file and folder in the system is backed up. A full backup takes longer and requires more space than other types of backups but the process of restoring lost data from backup is much faster. 完全备份是指备份系统中的每个文件和文件夹。与其他类型的备份相比，完全备份需要更长的时间和更多的空间，但是从备份中恢复丢失数据的过程要快得多。 |
| Incremental Backup  增量备份 | With incremental backup, only the initial backup is a full one. Subsequent backups only stores changes that were made since the previous backup. The process of restoring lost data from backup is longer but the backup process is much quicker.对于增量备份，只有初始备份是完整备份。后续备份只存储自上次备份以来所做的更改。从备份中恢复丢失数据的过程更长，但备份过程快得多。 |
| Differential backup  微分备份 | Differential backup only saves the new data or data that has changed since the last full backup; it does not make a backup of all the data every single time. This type of backup requires more storage space than incremental backup does, however, but it also allows for a faster restore time.差异备份仅保存自上次完整备份以来更改的新数据或数据;它不会每次都备份所有数据。然而，与增量备份相比，这种备份需要更多的存储空间，但它也允许更快的恢复时间。 |
| Mirror backup  镜像备份 | A mirror backup is an exact copy of the source data. With a mirror, the only copy that is stored in your backup source is the data source as it existed during your last backup. The advantage of a mirror is that the backup does not contain old or files. 镜像备份是源数据的精确副本。对于镜像，存储在备份源中的惟一副本是上次备份时存在的数据源。镜像的优点是备份不包含旧文件或文件。 |

**Certificate Authority (CA)** **证书颁发机构(CA)**

Authorized company issues and verifies digital certificates授权公司签发并验证数字证书

Users apply for digital certificate from CA用户从CA申请数字证书

Stores info such as user’s name, issuing CA’s name/signature, serial number of the certificate存储用户名、签发CA的名称/签名、证书序列号等信息

Digital certificate is encrypted数字证书加密

**Secure Socket Layer (SSL)** 数字安全协议

* Provides encryption of all data that passes between client and Internet server Web addresses beginning with “https” indicate secure connections提供客户端和Internet服务器之间传输的所有数据的加密，这些数据以“https”开头，表示安全连接
* Provides encryption and requires the client to have a digital cert. 提供加密并要求客户端具有数字证书。
* Prevents illegal tampering of data防止非法篡改资料

**Disaster Recovery Plan灾难恢复计划**

Written plan for restoring computer operations in the event of a disaster在发生灾难时恢复计算机操作的书面计划

* Emergency plan steps to be taken immediately after disaster灾难发生后立即采取的应急措施
* Backup plan how backup files and equipment would be used to resume information processing备份计划如何使用备份文件和设备恢复信息处理
* Recovery plan actions to be taken to restore full information processing operations恢复计划要采取的行动，以恢复完整的信息处理操作
* Test plan simulates various levels of disasters and records ability to recover测试计划模拟各种级别的灾难并记录恢复能力

# Chapter 7: Cloud Computing

**Cloud Computing**

Examples of Cloud Storage application

Dropbox, Gmail, Facebook，e-mail，Web conferencing，Online Storage (DriveHQ, Dropbox, OpenDrive, SpiderOak)，Customer Relationship Management (CRM), Microsoft Live Meeting are some examples

**benefits**

Access applications as utilities over the Internet在Internet上以实用程序的形式访问应用程序

Manipulate and configure applications online at any time随时在线操作和配置应用程序

It does not require to install a specific piece of software to access or manipulate cloud application它不需要安装特定的软件来访问或操作云应用程序

Offers online development and deployment tools, programming runtime environment through PAAS提供在线开发和部署工具，通过PAAS编程运行时环境

Resources are available over the network that provides platform independent access to any type of users网络上的资源可以为任何类型的用户提供独立于平台的访问

Offers on-demand self-service, resources can be used without interaction with the cloud service provider提供按需自助服务，无需与云服务提供商交互即可使用资源

Highly cost effective as it operates at higher efficiencies with greater utilization. It just requires an Internet connection. 高成本效益，因为它的运作效率更高，利用率更高。它只需要一个互联网连接。

Offers load balancing that makes it more reliable提供更可靠的负载平衡

**risk**

**Security & Privacy**

Data and infrastructure management is provided by a third-party.A huge risk to handover sensitive data to Cloud Service Provider (CSP).Security breach results in loss of clients and business( credit card data and user login credentials) 数据和基础设施管理由第三方提供。将敏感数据移交给云服务提供商(CSP)是一个巨大的风险。安全漏洞导致客户和业务损失(信用卡数据和用户登录凭证)

**Lock in**

Differences between vendor platforms may create difficulties in migrating from one cloud platform to another, which could equate to additional costs and configuration complexities. Gaps or compromises made during a migration could also expose your data to additional security and privacy vulnerabilities供应商平台之间的差异可能会造成从一个云平台迁移到另一个云平台的困难，这可能等同于额外的成本和配置复杂性。迁移过程中出现的漏洞或妥协也可能使您的数据暴露于额外的安全性和隐私漏洞

**Loss of control over end user actions失去对最终用户操作的控制**

When companies are in the dark about workers using cloud services (For instance, a salesperson who is about to resign from the company could download a report of all customer contacts, upload the data to a personal cloud storage service, and then access that information once she is employed by a competitor.) 当公司对工人在黑暗中使用云服务(例如,一个销售人员即将辞去公司可以下载一份报告的所有客户联系人,将数据上传到个人云存储服务,然后访问这些信息一旦她受雇于一个竞争对手。)

**Stored Data is Lost**

Data stored in the cloud can be lost for reasons other than malicious attacks. Accidental deletion of data by the cloud service provider or a physical catastrophe, such as a fire or earthquake, can lead to the permanent loss of customer data. 存储在云中的数据可能会因为恶意攻击以外的原因丢失。云服务提供商意外删除数据或发生火灾、地震等物理灾难，可能导致客户数据永久丢失。

**Deployment Models (4)**

Public Cloud

a publicly accessible cloud environment owned by a third-party cloud provider. Allows systems/services to be easily accessible to the public. May be less secure because of its openness e.g. e-mail第三方云提供商拥有的可公开访问的云环境。让公众容易使用系统/服务。可能因为它的开放性而不安全，例如电子邮件

Private Cloud

A private cloud is owned by a single organization. Allows systems/services to be accessible within an organization. Increased security because of its private nature私有云由单个组织拥有。允许在组织内访问系统/服务。因为它的私密性而增加了安全性

Community Cloud

A community cloud is similar to a public cloud except that its access is limited to a specific community of cloud consumers.  Allows systems/services to be accessible by group of organizations社区云与公共云类似，不同之处在于它的访问仅限于云消费者的特定社区。允许组织组访问系统/服务

Hybrid Cloud

A mixture of public and private cloud. Critical activities are performed using private cloud while the non-critical activities are performed using public cloud公共云和私有云的混合。关键活动使用私有云执行，而非关键活动使用公共云执行

**Service Models (3)**

Service Models 服务模式- reference models in developing the Cloud Computing. Categorized into three basic service models:开发云计算的参考模型。分为三种基本服务模式:

Infrastructure as a Service (IAAS) **为**基础架构服务**:** provides access to fundamental resources such as physical machines, virtual machines, virtual storage, e.g. servers:提供对基本资源(如物理机器、虚拟机、虚拟存储，如服务器)的访问

Platform as a Service (Paas)为平台服务**:** provides the runtime environment for applications, development & deployment tools e.g. DB, Web/Application Server, Deployment Tools (e.g. Codeship - deployment solution that supports Rails, Node, Python, PHP, Java, Scala, Groovy)为应用程序、开发和部署工具(如DB、Web/应用服务器、部署工具(如Codeship—支持Rails、Node、Python、PHP、Java、Scala、Groovy的部署解决方案)提供运行时环境。

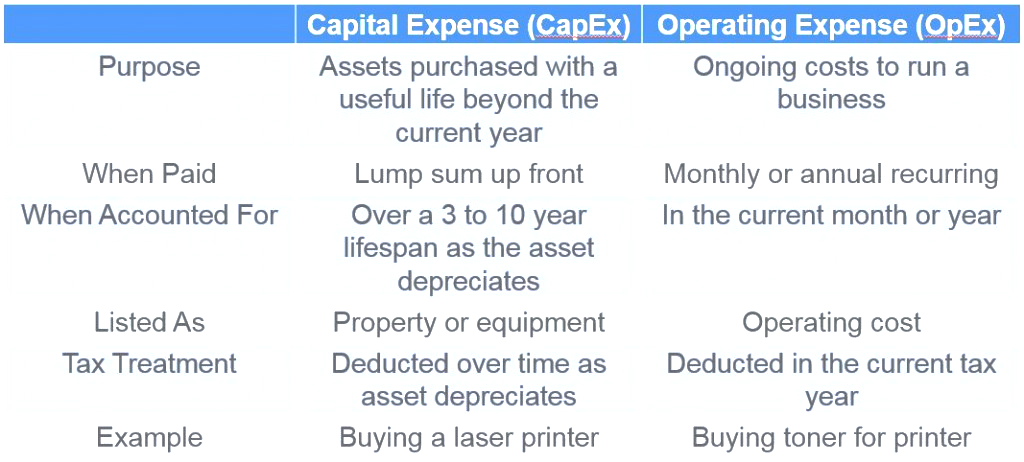
Software as a Service (SaaS) 为软件服务**:** model allows to use software applications as a service to end users e.g. Email (YahooMail, Hotmail, Gmail), Google Apps, Salesforce, Citrix模型允许将软件应用程序作为服务提供给最终用户，如电子邮件(YahooMail, Hotmail, Gmail)，谷歌应用程序，Salesforce, Citrix

**Cloud Cost Management (2)**

Cloud computing generally have two options when it comes to procuring new equipment, capabilities, and software: they can obtain new capabilities and equipment as a capital expense (CapEx) and they can obtain them as an operating expense (OpEx). 云计算在购买新设备、功能和软件时通常有两种选择:它们可以作为资本费用(CapEx)获得新功能和设备，也可以作为运营费用(OpEx)获得这些功能和设备。

Capital Expenditures (CAPEX)  资本支出-Refer to expenses that benefit the company in the **future** and the amounts that companies use to **purchase major physical goods or services** that will be used for **more than one year**. 指对公司未来有利的支出，以及公司用于购买将使用一年以上的主要实物商品或服务的金额。

Operational Expenditures (OPEX) 经营费用- refer to the expenses that a company incurs in their day-to-day operations and the expenses that are required to keep the company in business on a daily basis.指公司在日常经营中发生的费用和维持公司日常经营所需的费用。



# Chapter 8: Green Computing

**Green Computing**

Green computing is the environmentally responsible and eco-friendly use of computers and their resources. 绿色计算是一种对环境负责和生态友好的使用计算机及其资源。

**Sustainability and goal/why**

The definition of “*sustainability*” is the study of how natural systems function, remain diverse and produce everything it needs for the ecology to remain in balance. “可持续性”的定义是研究自然系统如何运作，如何保持多样性，以及如何生产生态系统保持平衡所需的一切。

goal is to achieve balance/harmony between environment sustainability, economic sustainability and socio-political sustainability. 目标是在环境可持续性、经济可持续性和社会政治可持续性之间取得平衡/和谐。

why? Pollution, computer energy is often wasteful, printing, Toxicity

**Global Warming**

Global warming, also referred to as climate change, is the observed century-scale rise in the average temperature of the Earth's climate system and its related effects. 全球变暖，又称气候变化，是地球气候系统平均温度的百年尺度上升及其相关影响。

warming that results when the atmosphere traps heat radiating from Earth toward space. 当大气吸收从地球向太空辐射的热量时，就会导致全球变暖。

Glaciers are melting, sea levels are rising, cloud forests are dying, and wildlife is scrambling to keep pace. 冰川正在融化，海平面正在上升，云雾林正在死亡，野生动物也在奋力追赶。

**Natural and Energy Sources**

Natural resource 自然资源– anything that humans use that comes from nature. Humans do not make naturalresources **–** they are gathered from earth人类使用的一切来自自然的东西。人类不制造自然资源—它们是从地球上收集来的

Examples - air, water, wood, oil, wind energy, hydro-electric energy, iron and coal 例如:空气、水、木材、石油、风能、水电、铁和煤

Geothermal – natural heat of rock deep underground 地热能-地下深处岩石的天然热量

**Green House Gas (GHG) and 4 type of gases**

FOSSIL FUEL化石燃料

a fuel formed by natural processes, such as anaerobic decomposition of buried dead organisms, containing energy originating in ancient photosynthesis. 一种由自然过程形成的燃料，如被掩埋的死生物体的厌氧分解，包含源自古代光合作用的能量。

RENEWABLE ENERGY可再生能源

energy that is collected from renewable resources, which are naturally replenished on a human timescale, such as sunlight, wind, rain, tides, and waves. 从可再生资源中收集的能量，这些资源在人类的时间尺度上自然地得到补充，如阳光、风、雨、潮汐和波浪。

BIOMASS生物质能

organic material that comes from plants and animals, and it is a renewable source of energy. Biomass contains stored energy from the sun. Plants absorb the sun's energy in a process called photosynthesis. When biomass is burned, the chemical energy in biomass is released as heat. 有机材料来自植物和动物，是一种可再生能源。生物量包含太阳储存的能量。植物通过光合作用吸收太阳的能量。当生物质燃烧时，生物质能中的化学能作为热量释放出来。

TRADITIONAL BIOMASS传统生物质能

Wood fuels, agricultural by-products and dung burned for cooking and heating purposes. In developing countries, traditional biomass is still widely harvested and used in an unsustainable and unsafe way. 用于烹调和取暖的木材燃料、农业副产品和粪便。在发展中国家，传统的生物量仍然被广泛收获，并以不可持续和不安全的方式使用。

**Carbon Footprint**

Carbon Footprint - Total amount of GHG gas produced in support of human activity expressed in tons of CO2, of the extent to which these activities produce harmful emissions. 碳足迹-支持人类活动产生的温室气体总量，以吨二氧化碳表示，这些活动产生有害排放的程度。

**Green Technology (5)**

Energy - alternative energy, fuel, new techniques of generating energy for energy efficiency (solar energy, wind energy…) 替代能源、燃料、提高能源效率的新能源生产技术 (太阳能、风能……)

Green Computing-virtualization, power management and optimization of IT infrastructure and electronic waste disposal to meet sustainability requirements. (computer/AC energy saving)虚拟化、电力管理和优化IT基础设施和电子垃圾处理，以满足可持续发展的要求。(电脑/ AC节能)

Green Chemistry绿色化学 - The design and use of chemical products and processes to reduce the generation of hazardous substances. (Biodegradable Plastics) -设计和使用化学产品和工艺来减少有害物质的产生。(可生物降解塑料)

Green Nanotechnology 绿色纳米技术- Nanotechnology refers to the manipulation of materials at the scale of the nanometer which is one billionth of a meter. Green Chemistry and Green Engineering –(recycle, eco-friendly materials)纳米技术是指在纳米尺度上操纵材料，纳米尺度是十亿分之一米。绿色化学与绿色工程-(循环再造、环保材料)

Green Building-This surrounds everything from the raw building materials to the location of a building. (solar power, Energy efficient window systems)包括从建筑原材料到建筑位置的一切。(太阳能、节能窗系统)

**ENEGRY STAR**

Developed by DOE – US Department of Environment and EPA – Environmental Protection Agency由美国能源部和环境保护局共同开发

Program to reduce electricity used by computers and devices. Encourages manufacturers to create energy-efficient devices that use little power减少电脑和设备用电的计划。鼓励制造商生产低能耗的节能设备

**data center**

Data Centres (DC) 数据中心primary factor behind energy consumption能源消耗背后的主要因素

DC infrastructure i.e. IT equipment, servers, power, cooling, networking devices, storage直流基础设施，即IT设备、服务器、电源、冷却、网络设备、存储

DC efficiency 直流效率 measured via PUE index (Power Usage Effectiveness)通过PUE指数测量(电力使用效率)

**benefits for green computing**

Reduced energy usage translates to lower CO2 emissions, stemming from fossil fuel reduction减少能源使用意味着减少化石燃料排放的二氧化碳排放量

Conserving resources means less energy is required to produce, use, and dispose of products 节约资源意味着生产、使用和处理产品所需的能源更少

Saving energy and resources saves money节约能源和资源节约金钱

Changing government policy to encourage recycling and lowering energy use by its people改变政府政策，鼓励循环利用，降低人民的能源消耗

Reduce chemical risk exposure known to cause cancer, nerve damage and immune reactions in humans减少已知会导致癌症、神经损伤和人类免疫反应的化学风险暴露

**Green Computing Strategies for:**

**organizations**

* Virtualization 虚拟化consolidate servers. Divide into virtual machines running different applications整合服务器。分为运行不同应用程序的虚拟机
* Power Management 电源管理sleep mode for computers and devices 计算机和设备的休眠模式
* Buy computers with low power consumption processors and power supplies购买低功耗处理器和电源的电脑
* Recycle computers, IT equipment. Dispose them in an environmental way回收电脑、资讯科技设备。以环保的方式处理

**what everyone can do**

* Buy Energy Star computers购买能源之星电脑
* Do not leave computers running overnight, turn them off when not in use不要让电脑整夜运行，在不用的时候把它们关掉
* Use LCD instead of CRT monitors 使用液晶显示器代替阴极射线管显示器
* Telecommute to save gas, petrol. Use video conferencing, VoIP for meetings远程办公以节省汽油和汽油。使用视频会议，VoIP进行会议

# Chapter 9: computer career

**Disciplines in Higher Education高等教育学科**

Computer Science-programs that stress theoretical side of programming i.e. focus on systems programming (Operating System) instead of applications programming计算机科学-强调编程理论方面的程序，即侧重于系统编程(操作系统)而不是应用程序编程

Computer Engineering- programs that teach students how to design and develop components found in computers and peripheral devices计算机工程-教学生如何设计和开发计算机和外围设备中的部件的程序

Computer Information Systems- programs that emphasize practical aspects of computing计算机信息系统-强调计算的实际方面的程序

**Computer Software Industry计算机软件行业**

Software engineer designs and develops software软件工程师设计和开发软件

**Computer scientist** researches, invents, and develops solutions to complex software problems计算机科学家研究、发明和开发复杂软件问题的解决方案

Project developeranalyzes requirements, designs solutions, and oversees software development process项目开发人员分析需求，设计解决方案，并监督软件开发过程

Programmer writes and tests computer programs程序员编写和测试计算机程序

**Information Technology (IT) Department资讯科技署**

Management管理, Research and software development研究及软件开发, Technical support services技术支援服务, Operations营运, Training/Support培训/支援, Information security services资讯保安服务, Marketing/Strategy市场推广/策略

**Technology Equipment Field(4)** **技术设备领域(4)**

1. Computer Service and Repair Industry计算机服务和维修行业

Provides preventative maintenance, component installation and repair services提供预防性维护、部件安装和维修服务

Computer technician installs, maintains, repairs and upgrades hardware计算机技术员负责硬件的安装、维护、维修和升级

Example: DELL, HP

How does a technician diagnose a problem? 技术人员如何诊断问题?

1. Technology Salespeople技术销售人员

Must possess a general understanding of technology and specific knowledge of the product they are selling必须对他们所销售的产品有一般的技术了解和专门的知识

Key skills required: Interpersonal skills i.e. communication, listening ability所需的关键技能: 人际交往能力，即沟通、倾听能力

1. Career in Education职业教育

Schools, colleges, universities and private companies need educators and trainers学校、学院、大学和私营公司需要教育工作者和培训人员

Corporate trainers teach employees how to use software, design and develop systems, and program企业培训师教员工如何使用软件、设计和开发系统以及编程

1. IT Consultant and Helpdesk Specialist IT顾问和帮助台专家

IT Consultant - typically hired based on expertise, provides technology services to his or her clients IT顾问——通常根据专业知识招聘，为客户提供技术服务

Help desk Specialist - answers hardware, software and networking questions in person over the phone or electronically via email or a chat room帮助台专家-通过电话或电子邮件或聊天室回答硬件、软件和网络问题

|  |  |
| --- | --- |
| Technology Operations Jobs (4) 技术操作职位(4) | |
| Computer Technician  计算机技术人员 | Installs, maintains, and repairs hardware and servers; installs, upgrades, and configures software; troubleshoots hardware problems安装、维护和维修硬件和服务器;安装、升级和配置软件;故障排除硬件问题 |
| Help Desk Specialist/ Help Desk Technician  服务台专家/技术人员 | Answers technology-related questions in person, on the phone, or via email or an online chat room亲自、通过电话、电子邮件或在线聊天室回答与技术相关的问题 |
| Network Administrator/ Engineer  网络管理员/工程师 | Installs, configures, and maintains LANs, WANs, wireless networks, intranets, Internet systems, and network software; identifies and resolves connectivity issues安装、配置和维护局域网、广域网、无线网络、内部网、Internet系统和网络软件;识别并解决连接性问题 |
| Technical Project Manager  技术项目经理 | Guides design, development, and maintenance tasks; serves as interface between programmers/developers and management指导设计、开发和维护任务;作为程序员/开发人员和管理人员之间的接口 |
| Data Storage, Retrieval and Analysis Jobs (5) 数据存储、检索和分析工作(5) | |
| Data Scientist  数据科学家 | Uses analytics and other Big Data techniques to interpret a company’s data from a variety of sources to better understand its performance, make recommendations for improvement, and predict future outcomes使用分析和其他大数据技术从各种来源解释公司的数据，以更好地了解其业绩，提出改进建议，并预测未来的结果 |
| Database Administrator  数据库管理员 | Creates and maintains the data dictionary; monitors database performance创建和维护数据字典;监控数据库性能 |
| Database Analyst  数据库分析师 | Uses data modeling techniques and tools to analyze and specify data usage使用数据建模技术和工具来分析和指定数据使用情况 |
| Digital Forensics Examiner  数字取证审查员 | Collects and analyzes evidence found on computers, networks, mobile devices, and databases收集和分析在计算机、网络、移动设备和数据库中发现的证据 |
| Web Analytics Expert  网络分析专家 | Collects and measures Internet data, such as website traffic patterns and advertising, and develops reports that recommend strategies to maximize an organization’s web presence收集和测量互联网数据，如网站流量模式和广告，并开发报告，建议策略，以最大限度地提高一个组织的网络存在 |
| Information and Systems Security Jobs (6) 资讯及系统保安工作(6) | |
| Computer Security Incident Responder  计算机安全事件响应程序 | Creates logs, documentation, and recovery plans based on cybersecurity threats and incidents根据网络安全威胁和事件创建日志、文档和恢复计划 |
| Computer Security Specialist/ Mobile Security Specialist  计算机安全专家/  移动安全专家 | Responsible for the security of data and information stored on computers and mobile devices within an organization负责组织内存储在计算机和移动设备上的数据和信息的安全性 |
| Digital Forensics Analyst  数字取证分析 | Inspects electronic data to recover documents and files from data storage devices that may have been damaged or deleted, in order to use them as evidence in a crime investigation检查电子数据，以便从可能被损坏或删除的数据储存装置中复原文件和档案，以便用作罪案调查的证据 |
| Network Security Administrator  网络安全管理员 | Configures routers and firewalls; specifies web protocols and enterprise technologies配置路由器和防火墙;指定web协议和企业技术 |
| Security Analyst  安全分析师 | Implements security procedures and methods, looks for flaws in security of a company’s devices and networks, works with and trains employees at all levels, and assigns permissions and network settings执行安全程序和方法，查找公司设备和网络的安全漏洞，与各级员工一起工作和培训，分配权限和网络设置 |
| Security System Project Manager  安全系统项目经理 | Develops and maintains programs and tools designed to provide security to a network开发和维护为网络提供安全的程序和工具 |
| App Development and Mobile Technologies Jobs (5) App开发与移动技术工作(5) | |
| Desktop or Mobile Application Programmer/Developer  桌面或移动  应用程序程序员/  开发人员 | Converts the system design into the appropriate application development language, such as Visual Basic, Java, C#, and Objective C, and toolkits for various platforms将系统设计转换为适当的应用程序开发语言，如Visual Basic、Java、c#和Objective C，以及用于各种平台的工具包 |
| Games Designer/Programmer  游戏设计师/程序员 | Designs games and translates designs into a program or app using an appropriate application development language使用适当的应用程序开发语言设计游戏并将设计转化为程序或应用程序 |
| Mobile Strategist  移动策略师 | Integrates and expands the company’s initiatives for mobile users整合和拓展公司的移动用户计划 |
| Mobile Technology Expert移动技术专家 | Develops and directs an organization’s mobile strategy, including marketing and app development开发和指导组织的移动战略，包括市场营销和应用程序开发 |
| Virtual Reality Engineer虚拟现实技术工程师 | Designs applications that incorporate technologies (such as VR and 3-D) with tools (such as Google Cardboard) to create storytelling tools and apps设计应用程序，将技术(如VR和3d)与工具(如谷歌Cardboard)结合起来，创建讲故事的工具和应用程序 |

|  |  |
| --- | --- |
| System Development Jobs (8)系统开发工作(8) | |
| Cloud Architect  云计算架构师 | Identifies business requirements, strategies, and solutions for cloud storage and services that meet a company’s goals or needs识别满足公司目标或需求的云存储和服务的业务需求、策略和解决方案 |
| Cognitive Engineer  认知工程 | Develops artificial-intelligence-based machines and programs based on data analysis to mimic human thought processes开发基于人工智能的机器和基于数据分析的程序来模拟人类的思维过程 |
| Database Designer  数据库设计师 | Specifies the structure, interface, and requirements of a large-scale database; determines security and permissions for users指定大型数据库的结构、接口和需求;确定用户的安全性和权限 |
| Program & App Developer  项目和应用程序开发人员 | Specifies, designs, implements, tests, and documents programs and apps in a variety of fields, including robotics, operating systems, animation, and applications指定、设计、实现、测试和记录各种领域中的程序和应用程序，包括机器人、操作系统、动画和应用 |
| Systems Analyst系统分析师 | Works closely with users to analyze their requirements, designs and develops new information systems, and incorporates new technologies与用户紧密合作，分析他们的需求，设计和开发新的信息系统，并融合新技术 |
| Systems Programmer  系统程序员 | Installs and maintains operating system software and provides technical support to the programming staff安装和维护操作系统软件，为编程人员提供技术支持 |
| Web Designer  网页设计师 | Designs the layout, navigation, and overall appearance of a website with a focus on user experience; specifies a website’s appearance using HTML5, JavaScript, CSS, media, and other web design technologies以用户体验为中心，设计网站的布局、导航和整体外观;使用HTML5、JavaScript、CSS、媒体和其他web设计技术指定网站的外观 |
| Web Developer  Web开发人员 | Analyzes, develops, and supports the functionality of a website, including applications that often interact with databases or other online resources分析、开发和支持网站的功能，包括经常与数据库或其他在线资源交互的应用程序 |

**Technology Certifications (7)**

Application Software Certifications应用软件认证

Corporate trainers 企业培训师

Help desk specialists帮助台专家

Office managers/workers办公室经理/员工

Technology sales representatives技术销售代表

Technology teachers技术老师

Data Analysis and Database Certifications数据分析和数据库认证

Data scientist数据科学家

Database administrators数据库管理员

Database analysts 数据库分析师

Digital forensics examiners数字取证审查员

Hardware Certifications

Computer repair technicians电脑维修技术人员

Corporate trainers企业培训师

Help desk specialists帮助台专家

System engineers and administrators系统工程师及管理员

Networking Certifications网络认证

Hardware service technicians硬件服务技术人员

Network managers网络管理人员

Network engineers网络工程师

System administrators系统管理员

Operating System Certifications操作系统认证

Hardware technicians硬件技术人员

Help desk specialists帮助台专家

Network administrators网络管理员

System administrators系统管理员

Program/Developer Certifications程序/开发者证书

Game/Web developers游戏/ Web开发人员

Mobile application developers移动应用程序开发人员

Project leaders/managers项目主管/经理

Systems analyst系统分析师

Security Certifications安全认证

Information security officers and managers资讯保安人员及经理

Law enforcement officials执法官员

Military intelligence officers军事情报官员

Network administrators网络管理员

Wireless network administrators无线网络管理员

Network security specialists网络安全专家

Security administrators安全管理员