Unit 1 Computer Basic Knowledge

Text 1 The History of Computer's Development

A computer is a machine that manipulates data according to a set of instructions.

History

The first adding machine, a precursor of the digital computer, was devised in 1642 by the French scientist, mathematician, and philosopher Blaise Pascal. This device employed a series of ten-toothed wheels, each tooth representing a digit from 0 to 9. The wheels were connected so that numbers could be added to each other by advancing the wheels by a correct number of teeth. In the 1670s the German philosopher and mathematician Gottfried Wilhelm Leibniz improved on this machine by devising one that could also multiply.

The French inventor Joseph-Marie Jacquard, in designing an automatic loom, used thin, perforated wooden boards to control the weaving of complicated designs. During the 1880s the American statistician Herman Hollerith conceived the idea of using perforated cards, similar to Jacquard's boards, for processing data. Employing a system that passed punched cards over electrical contacts, he was able to compile statistical information for the 1890 United States census.

The Analytical Engine

Also in the 19th century, the British mathematician and inventor Charles Babbage worked out the principles of the modern digital computer. He conceived a number of machines, such as the Difference Engine, that were designed to handle complicated mathematical problems. Many historians consider Babbage and his associate, the mathematician Augusta Ada Byron, the true pioneers of the modern digital computer. One of Babbage's designs, the Analytical Engine, had many features of a modern computer. It had an input stream in the form of a deck of punched cards, a"store" for saving data, a "mill" for arithmetic operations, and a printer that made a permanent record. Babbage failed to put this idea into practice,though it may well have been technically possible at that date.

Early Computers

Analogue computers began to be built in the late 19th century. Early models calculated by means of rotating shafts and gears. Numerical approximations of equations too difficult to solve in any other way were evaluated with such machines. Lord Kelvin built a mechanical tide predictor that was a specialized analogue computer. During World Wars I and II, mechanical and, later, electrical

analogue computing systems were used as torpedo course predictors in submarines and as bombsight controllers in aircraft. Another system was designed to predict spring floods in the Mississippi River basin.

Electronic Computers

During World War II, a team of scientists and mathematicians, working at Bletchley Park, north of London, created one of the first all-electronic digital computers: Colossus. By December 1943, Colossus, which incorporated 1,500 vacuum tubes, was operational. It was used by the team headed by Alan Turing, in the largely successful attempt to crack German radio messages enciphered in the Enigma code.

Independently of this, in the United States, a prototype electronic machine had been built as early as 1939, by John Atanasoffl and Clifford Berry at Iowa State College. This prototype and later research were completed quietly and later overshadowed by the development of the Electronic Numerical Integrator And Computer (ENIAC) in 1945.ENIAC was granted a patent, which was overturned decades later, in 1973,when the machine was revealed to have incorporated principles first used in the Atanasoff-Berry Computer.

ENIAC contained 18,000 vacuum tubes and had a speed of several hundred multiplications per minute, but originally its program was wired into the processor5 and had to be manually altered. Later machines were built with program storage, based on the ideas of the Hungarian-American mathematician John von Neumann6. The instructions, like the data, were stored within a “memory”, freeing the computer from the speed limitations of the paper-tape reader during execution and permitting problems to be solved without rewiring the computer.

The use of the transistor in computers in the late 1950s marked the advent of smaller, faster, and more versatile logical elements than were possible with vacuum-tube machines. Because transistors use much less power and have a much longer life, this development alone was responsible for the improved machines called second-generation computers. Components became smaller, as did inter-component spacings, and the system became much less expensive to build.

Integrated Circuits

Late in the 1960s the integrated circuit, or IC, was introduced, making it possible for many transistors to be fabricated on one silicon substrate, with interconnecting wires plated in place. The IC resulted in a further reduction in price, size, and failure rate. The microprocessor became a reality in the mid-1970s with the introduction of the large-scale integrated (LSI) circuit and, later, the very large-scale integrated (VLSI) circuit (microchip), with many thousands of interconnected transistors etched into a single silicon substrate.

To return, then, to the switching capabilities of a modern computer:computers in the 1970s were generally able to handle eight switches at a time. That is, they could deal with eight binary digits, or bits, of data, at every cycle. A group of eight bits is called a byte, each byte containing 256 possible patterns of ONs and OFFs (or 1s and 0s). Each pattern is the equivalent of an instruction, a

part of an instruction, or a particular type of datum, such as a number or a character or a graphics symbol. The pattern 11010010, for example, might be binary data—in this case, the decimal number 210—or it might be an instruction telling the computer to compare data stored in its switches to data stored in a certain memory-chip location.

The development of processors that can handle 16, 32, and 64 bits of data at a time has increased the speed of computers. The complete collection of recognizable patterns—the total list of operations—of which a computer is capable is called its instruction set. Both factors—the number of bits that can be handled at one time, and the size of instruction sets—continue to increase with the ongoing development of modern digital computers.

Generations of Electronic Computer

The development of computer has experienced four generations till now. Let's take a look at each of them.

(1) The first generation of computer (1946~1958)

The first generation of computer was characterized by the main feature of the ENIAC-vacuum tubes. Through 1950s, several other computers were built, each contributing significant advancements, such as binary arithmetic, random access, and the concept of stored programs. These computer concepts are common in today's computers.

(2) The second generation of computer (1959~1964)

To most people, the invention of the transistor meant small portable radios. To those in the data processing business, it signaled the start of the second generation of computer. The transistor meant more powerful, more reliable, and less expensive computers that would occupy less space and give off less heat than did vacuum-tube-powered computers.

The expense item should be emphasized. During the first, second, and part of the third generations, the cost of a computer represented a significant portion of a company's budget. Computers were expensive. Significant innovations have resulted in enormous increases in computer performance and obvious reductions in price. This trend, established with the introduction of second-generation computers, continues today.

(3) The Third Generation of Computer (1964~1971)

On April 7, 1964, IBM announced their System 360 line of computers. It was considered to be the most important event in the history of computer. It is the beginning of the third generation of computer, which was characterized by the integrated circuit or IC.

The compatibility problems of second-generation computers were almost eliminated in third-generation computers. In other ways, third-generation computers work so quickly that they provide the capacity to run more than one program concurrently. For example, at any given time the computer might be printing payroll checks, accepting orders, and testing programs.

(4) The Fourth Generation of Computer (1971~now)

The start of the fourth generation of computers was 1971. Large-Scale Integration circuits became basic computers. Our personal computers, or microcomputers, belong to this generation.

One of the most significant contributions of the fourth generation of computer is the microprocessor. The microprocessor can be contained on a single silicon chip. The first fully operational microprocessor was invented in 1971. And they have been developing very fast. This device costs less than a soft drink and can be found in everything from lifts to satellites.

Most computers producers classify their computers as being in the fourth generation of computer, and a few call theirs the "fifth generation". The first three generations were characterized by significant technological breakthroughs in electronics—the use of vacuum tubes, then transistors, and then integrated circuits. Some people prefer to consider the start of the fourth generation as 1971, while some others argue that if we accept this premise, then there would probably have been a fifth, a sixth, and maybe be seventh generation since 1971.

As science and technique are developing continually, new generations of computer will emerge in the future.

Words and Expressions

manipulate [mə'nipjuleit] v. 操纵，利用，假造[计算机]操作
adding machine 收款机
precursor [pri(:)'kə:sə] n. 先驱者，前导，先进者
philosopher [fi'lɔsəfə] n. 哲学家
mathematician [ˌmæθimə'tiʃən] n. 数学家
automatic loom 自动织布机
statistician [ˌstætis'tiʃ (ə)n] n. 统计学家，统计员
electrical contacts 电触头
census ['sensəs] n. 户口普查 v. 实施统计调查
arithmetic operation 算术运算、算术操作
rotating shaft 转轴
evaluated [i'væljueitid] adj. 估价的
analogue computing 模拟计算机
Mississippi River basin 密西西比河流域
incorporated [in'kɔ:pəreitid] adj. 组成公司的，合成一体的
independently of 与. . . 无关（不取决于）
transistor [træn'zistə] n. 晶体管（收音机）
integrated circuits 集成电路
fabricate ['fæbrikeit] v. 制造（装配，伪造）
silicon substrate 硅衬底，硅基片
interconnecting 互连
symbol ['simbəl] n. 符号，标志，象征
recognizable pattern 可识别模式
ongoing ['ɔngəuiŋ] adj. 前进的，进行的 n. 前进，举止，行为
vacuum tube 电子管
binary ['bainəri] adj. 二进位的，二元的

arithmetic [ə'riθmətik] n. 算术
occupy ['ɔkjupai] v. 占领，占，住进
established [is'tæbliʃt] adj. 确定的（建成的，建立的，被制定的） v. 建立（制定，证实）
expense item 费用项目
budget ['bʌdʒit] n. 预算 v. 编预算，为…做预算
innovation [ˌinəu'veiʃən] n. 创新，革新
result in 导致
enormous [i'nɔːməs] adj. 巨大的，庞大的
eliminate [i'limineit] v. 除去，排除，剔除[计算机]消除
microprocessor [maikrəu'prəusesə (r)] n. 微处理器
satellite ['sætəlait] n. 卫星
breakthrough ['breikθruː] n. 突破

Exercises

I. True or false? If correct, write T in parentheses; Otherwise, write F.

（ ）1. The first adding machine, a precursor of the digital computer, was devised in 1642 by the American scientist, mathematician, and philosopher Blaise Pascal.

（ ）2. In the 1670s the French philosopher and mathematician Gottfried Wilhelm Leibniz improved on this mac6/4/2010hine by devising one that could also multiply.

（ ）3. Also in the 19th century, the British mathematician and inventor Charles Babbage worked out the principles of the modern digital computer.

（ ）4. ENIAC contained 28,000 vacuum tubes and had a speed of several hundred multiplications per minute, but originally its program was wired into the processor5 and had to be manually altered.

（ ）5. Because transistors use much more power and have a much longer life, this development alone was responsible for the improved machines called second-generation computers.

（ ）6. The development of processors that can handle 16, 32, and 64 bits of data at a time has increased the speed of computers.

（ ）7. The start of the fourth generation of computers was 1971. Large-Scale Integration circuits became basic computers. Our personal computers, or microcomputers, belong to this generation.

II. Fill in the blanks with proper words.

1. A _____ is a machine that manipulates data according to a set of instructions.
2. A group of eight bits is called a _____.
3. _____ computers began to be built in the late 19th century.
4. The use of the _____ in computers in the late 1950s marked the advent of smaller, faster, and more versatile logical elements than were possible with vacuum-tube machines.
5. Late in the 1960s the integrated circuit, or_____, was introduced, making it possible for many transistors to be fabricated on one silicon substrate, with interconnecting wires plated in place.

6. Each byte containing _____possible patterns of ONs and OFFs (or 1s and 0s).

7. It is the beginning of the third generation of computer, which was characterized by the _____.

Reading Materials: A Glimpse of Computer Application

1. Computer in Science

Computers handle a variety of tasks in the broad area of science. Some categories of tasks in which computers can be helpful are in (1) performing mathematical calculations, (2)simulating and modeling. And (3) controlling laboratory instruments and devices.

(1) Performing Mathematical Calculations

Because of the enormous volume of data that must be stored and processed for some scientific tasks, super computers are used to handle the requirements. They process vast amounts of data and produce output in a form that is easy to read and interpret.

Some scientific tasks require real-time mathematical calculations. Real-time refers to the way a computer can process data so fast that it gives immediate feedback. Since real-time computer systems are so quick, they are often used as emergency systems to warn of potential or actual danger.

(2) Simulating and Modeling

Computers are also used for simulating and modeling. The computer makes simulation by duplicating the conditions likely to occur when certain variables are changed in a given situation. The computer is programmed to consider certain facts (which are stored in memory) and then come to a decision.

In computer modeling, the computer constructs a model (or prototype) of some object on the video screen. Shapes and sizes can easily be changed to alter the model. Computer models are used in many fields, such as astronomy and chemistry.

Sometimes simulation and modeling systems are referred to as expert systems, because they make decisions using the same information that experts in the field would use.

(3) Controlling Laboratory Instruments and Devices

Computers can also control various pieces of laboratory equipment. A program enables the equipment to operate both quickly and "intelligently". The use of computers in this area allows the researcher to spend valuable time conducting other experiments rather than overseeing the instruments.

2. Computers in Manufacturing

Manufacturing, which involves designing and making products, uses computers to become coefficients. It does this in two ways: (1) with special Computer-Aided Design and Manufacturing systems CAD/CAM; (2) with robotics.

(1) CAD/CAM

Before a product can be produced, it must be designed, and the actual design process can be quite time consuming and costly. Computer-Aided Design (CAD) allows the engineer to design, draft, and analyze a new product idea using computer graphics on video terminal.

Computer-Aided Design is often coupled with Computer-Aided Manufacturing (CAM), and the combination is known as CAD/CAM. Using CAD/CAM, the engineer can analyze not only the product but also the manufacturing process.

(2) Robotics

A new class of workers is being called upon to perform undesirable or dangerous work all over the world. These are the steel-collar workers. better known as robots. Robotics is the science that deals with the construction, capabilities, and applications of robots.

3. Office Automation

The widespread use of computers began in the workplace in offices, banks and factories. Today, most people are comfortably accustomed to the influence of computers on their lives. Probably the area in which computers have brought about the greatest: Hinge and now offer the greatest potential for com-rice automation is the office.

Office automation is a general term that combines computer and communication technology with the traditional manual procedures of firework. Office automation may be divided into three catteries(1)word processing (2)communication and(3)information retrieval.

(1) Word Processing

Word processing has led to the advancement of office automation and is definitely the best-established technology in the office today. It involves manipulation of text data to achieve a desired output. A typical word processing system consists of a keyboard, visual display device, a storage unit, and a printer. Like data processing, word processing relieves workers of time-consuming and routine tasks, resulting in increased productivity and quality.

(2) Communication

The exchange of information between workers on different floors, in different buildings, or in different cities and states is an essential part of the business world. Communication in the office can be automated to make the exchange faster and more efficiently The automation can take several forms: electronic-mail, voice-mail, teleconferencing, and telecommuting-eating.

(3) Information Retrieval

Information retrieval getting the stored information to users in a form they can understand is an important part of office automation today. In the past users often had to look through entire reports to locate information they needed if they were not sure where it was. To avoid this expensive and time-consuming process, they now can use an electronic file management system. Database management and text management systems have been designed for users. The information may be in the form of data, text, image, or voice. The user specifies key words and asks the computer to search through large volumes of text and produce lists telling where those words were used.

4. Computers in Education

Most people realize that computers will be vital to the success of today's youngsters. Parents are demanding that public schools should prepare their children for this complex technological world.

In addition to teaching about computers, schools also teach with computers. Computer-Assisted Instruction (CAI) in the schools is not new. For example, computers are commonly used to drill

students on multiplication tables or state capitals. Each student receives instruction adapted to his or her learning pace, immediate feedback. With a computer as teacher, the teacher-learner relationship is not threatening. The computer is in patience and good nature. Even very young children learn to be comfortable with teaching machines. In the long run, this early familiarity with computer may be the most durable lesson for everyone.

Words and Expressions

Glimpse [glimps] n. 一瞥[见]，模糊的感觉；少许，微量，微光
Laboratory [lə'bɔrətəri,'læbərətəri] n. 科学实验室，研究室，实验室
Feedback ['fi:dbæk] n. 反馈，回复，反应，（数据）资料　adj. 反馈的
Simulating ['simjuleitiŋ] n. 模拟
Modeling ['mɔdliŋ] n. 建模，造型
Duplicating [dju:plikeitiŋ] n. 复制，重复
Prototype ['prəutətaip] n. 原型，蓝本，样机[品]，样板；标准
Astronomy [əs'trɔnəmi] n. 天文学
Intelligently[in'telidʒənt] adv. 聪明地　adj. 可执行部分电脑工作的
Oversee [ˌəuvə'si:] vt. 监督，监视，检查，管理
Coefficient[ˌkəui'fiʃənt] n. 系数，共同作用，协同因素，程度
Robotics[rəu'bɔtiks] n. 机器人技术，机器人学
Computer-Aided Design (CAD)　计算机辅助设计
Computer-Aided Manufacturing (CAM)　计算机辅助制造
steel-collar ['sti:l,kʌlə] n. 机器人
information retrieval　信息检索，情报检索
Computer-Assisted Instruction (CAI)　计算机辅助教学
Drill[dril] n. 操练，训练，演习　vt. 练习
Durable['djuərəbl] adj. 耐久的，持久的，坚牢的，有永久性的

Text 2　Kinds of Computers

A computer is a multi-functional and programmable electronic processing machine. This means a computer is made up of electronic components and can be programmed to do a number of different tasks. The program is stored actually inside the machine, making it a stored program. A computer's function is to accept data and process them into information. Data flow into the machine as input and flow from the machine as output.

All computers, from the first room-sized mainframes, to today's powerful desktop, laptop and even hand-held PCs, perform the same general operations on information. What changes over time is the information handled, how it is handled, and how quickly and efficiently it can be done.

When you think about a computer and what it does, you of course think that "it computes". And this is indeed one part of its job. Computing is really another term for "information transformation"—changing information from one form to another.

One special form of information the computer process is its instructions. These are the commands that programmers give the computer to tell it what to do. Every time you do anything with a computer, you are really talking to a program that is talking to the computer. The language that computers speak, which is called machine language, is very complex and hard to understand.

Computers can be general classified by size and power as follows:

(1) Microcomputer

Microcomputer is generally a synonym for the more common term, personal computer, or PC, which is a small single-user computer based on a microcomputer. In addition to the microprocessor, a personal computer has a keyboard for entering data, a monitor for displaying information, and a storage device for saving data.

Microcomputers, also known as personal computers, are small computers that can fit on a desktop.Portable microcomputers can fit in a briefcase or even in the palm of your hand. Microcomputers are used in homes, schools, and industry. Today nearly every field uses microcomputers.

One type of microcomputer that is rapidly growing in popularity is the portable computer,which can be easily carried around. There are four categories of portable computers.Laptops: laptops, which weigh between 10 and 16 pounds, may be AC-powered, battery-powered,or both. The AC-powered laptop weighs 12 to 16 pounds. The battery-powered laptop weighs 10 to 15 pounds, batteries included, and can be carried on a shoulder strap.

Notebook PCs: notebook personal computers weigh between 5 and 10 pounds and can fit into most briefcases. It is especially valuable in locations where electrical connections are not available. Notebook computers are the most popular portable computers today.

Subnotebooks:Subnotebooks are for frequent flyers and life-on-the-road types.Subnotebooks users give up a full-size display screen and keyboard in exchange for less weight. Weighting between 2 and 6 pounds, these computer fit easily into a briefcase.

Personal Digital Assistants: much smaller than even the subnotebooks. Personal Digital Assistants (PDAs) weigh from 1 to 4 pounds. The typical PDA combines pen input, writing recognition, personal organizational tools, and communication capabilities in a very small package.

(2) Workstation

Workstation is a powerful single-user computer. It is like a personal computer, but it has a more powerful microprocessor and a higher-quality monitor.

(3) Minicomputer

Minicomputer (a term no longer much used) is a multi-user computer of a size between a microcomputer and a mainframe. Minicomputers, also knows as midrange computers, are desk-sized machines. They fall into between microcomputers and mainframes in their processing speeds and data-storing capacities. Medium-size companies or departments of large companies typically use them for specific purposes. For example, they might use them to do research or to monitor a particular manufacturing process.Smaller-size companies typically use microcomputers for their general data processing needs, such as accounting.

(4) Mainframe Computer

Mainframe or mainframe computer is a powerful multi-user computer. It is capable of supporting many hundreds or thousands of users at the same time. It is now usually referred to a "large server". Mainframe computers are larger computers occupying specially wired, air-conditioned rooms and capable of great processing speeds and data storage. They are used by large organizations business, banks, universities, government agencies—to handle millions of transactions. For example, insurance companies use mainframes to process information about millions of policyholders.

(5) Supercomputer

Supercomputer is an extremely fast computer that can perform hundreds of millions of instructions per second, but now it refers to a "very large server" and sometimes includes a system of computers using parallel processing. Supercomputers are special, high-capacity computers used by very large organizations principally for research purposes. Among their uses are oil exploration and worldwide weather forecasting.

In general, a computer's type is determined by the following seven factors:

The type of CPU

Microcomputers use microprocessors.

The larger computers tend to use CPUs made up of separate, high-speed, sophisticated components.

The amount of main memory the CPU can use

A computer equipped with a large amount of main memory can support more sophisticated programs and can even hold several different programs in memory at the same time.

The capacity of the storage devices

The larger computers systems tend to be equipped with higher capacity storage devices.

The speed of the output devices

The speed of microcomputer output devices tends to be rated in terms of the number of characters per second (cps) that can be printed usually in tens and hundreds of cps. Larger computers' output devices are faster and are usually rated at speeds of hundreds or thousands of lines that can be printed per minute.

The processing speed in millions of instructions per second (mips)

The term instruction is used here to describe a basic task the software asks the computer to perform while also identifying the data to be affected. The processing speed of the smaller computers ranges from 7 to 40 mips. The speed of large computers can be 30 to 150 mips or more, and supercomputers can process more than 200 mips. In other words, a mainframe computer can process your data a great deal faster than a microcomputer can.

The number of users that can access the computer at one time

Most small computers can support only a single user, some can support as many as two or three at a time. Large computers can support hundreds of users simultaneously.

The cost of the computer system

Business systems can cost as little as $500 (for a microcomputer) or as much as $10 million (for

a mainframe)and much more for supercomputer.

Words and Expressions

multi-functional 多功能
mainframe ['meinfreim] n. （大型电脑的）主机，中央处理机
hand-held adj. 手提式报话机；手执的
microcomputer [ˌmaikrə ukəm-'pju:tə] n. 微型计算机
Laptops 膝上计算机
Strap[stræp] n. 带子，皮带
Notebook PCs 个人笔记本电脑
Subnotebooks 超小型笔记本电脑，超轻薄笔记电脑
Personal Digital Assistants (PDAs) 个人数位辅助器，数字化个人助理
Workstation ['wə:ksteiʃən] n. 操作工位，工作区，工作站
Minicomputer ['minikəmpju:tə] n. 小型计算机；小型电脑
Mainframe Computer 大型计算机
Supercomputer [ˌsju:pəkəm'pju:tə] n. 超型计算机，巨型（电子）计算机
exploration [ˌeksplɔ:'reiʃən]n. 搜寻，考察，探究[索]，考[调]查
characters per second (cps) 每秒字符数
millions of instructions per second (mips) 每秒执行百万指令数

Exercises

I. True or false? If correct, write T in parentheses; Otherwise, write F.

（ ）1. Computing is really another term for “information transformation”—changing data from one form to another.

（ ）2. The language that computers speak, which is called machine language, is very complex and easy to understand.

（ ）3. Minicomputers, also knows as midrange computers, are desk-sized machines. They fall into between microcomputers and mainframes in their processing speeds and data-storing capacities.

（ ）4. Mainframe or mainframe computer is a powerful multi-user computer. It is capable of supporting many hundreds or thousands of users at the same time.

II. Fill in the blanks with proper words.

1. A _____ is a multi-functional and programmable electronic processing machine.
2. A computer’s function is to accept data and process them into _____.
3. _____ are the commands that programmers give the computer to tell it what to do.
4. Microcomputer is generally a synonym for the more common term, personal computer, or_____.
5. _____ personal computers weigh between 5 and 10 pounds and can fit into most briefcases.
6. The typical _____ combines pen input, writing recognition, personal organizational tools, and communication capabilities in a very small package.

7. _____ are special, high-capacity computers used by very large organizations principally for research purposes. Among their uses are oil exploration and worldwide weather forecasting.

Reading Materials: Top 10 Strategic Technologies in Computing

The ways of technology are notoriously hard to predict and few have a vision of the future. Gartner Inc.'s picks up 10 top strategic technologies for 2009 as following.

1. microcommerce

Microcommerce is an online selling/purchasing model that involves the exchange of very small sums of money, sometimes known as micropayments. Gartner forecast that online purchases of products and services priced at less than $5.00 would generate $30 billion per year by 2010. Examples of microcommerce include single song purchases, pay-per-click advertising, and per-article charges for access to online content.

2. desktop search

Desktop search (sometimes called integrated search) is the ability to simultaneously search multiple data sources—typically including the Internet and corporate intranets and databases as well as hard drives and removable storage on the user's computer—from a search term entered into a text box on the desktop. Desktop search programs create an index of files stored on the computer, which enables fast and fairly comprehensive searches. The user can search local hard drives, Web sites, e-mail, and other sources without having to minimize the current document or open a browser, e-mail client, or other application. HotBot offers basic desktop search tools; Microsoft, Yahoo, and Google are among the major vendors offering or developing their own versions. Eventually, desktop search could make it possible to find information stored anywhere in the world that was connected, even indirectly, to the Internet.

3. OLED

OLED (organic light-emitting diodes) is a display technology, pioneered and patented by Kodak, based on the use of organic polymer material as the semiconductor material in light-emitting diodes (LEDs). A polymer can be a natural or synthetic substance and macro or micro in size. Examples of organic polymers include proteins and DNA. OLED displays are used in cellular phones, digital video cameras, digital versatile disc (DVD) players, personal digital assistants (PDAs), notebooks, car stereos, and televisions. OLED displays are thinner and weigh less because they do not require backlighting. OLED displays also have a wide viewing angle up to 160 degrees even in bright light, and they use only two to ten volts to operate. New technologies that build on the OLED include FOLED (flexible organic light-emitting display), which promises to make highly portable, roll-up displays possible within the next few years.

4. Linux

Linux is a UNIX-like operating system that was designed to provide personal computer users a

free or very low-cost operating system comparable to traditional and usually more expensive UNIX systems. Linux has a reputation as a very efficient and fast-performing system. Linux is sometimes suggested as a alternative to Microsoft Windows. But it remains far behind Windows in numbers of users. However, its use in the business enterprise is growing.

5. IM

Instant messaging (sometimes called IM) is the ability to easily see whether a chosen friend or co-worker is connected to the Internet and, if they are, to exchange messages with them. Instant messaging differs from ordinary e-mail in the immediacy of the message exchange and also makes a continued exchange simpler than sending e-mail back and forth. Most exchanges are text-only. However, some services, such as AOL, allow voice messaging and file sharing.

6. SOA

A service-oriented architecture (SOA) defines how two computing entities interact in such a way as to enable one entity to perform a unit of work on behalf of another entity. The unit of work is referred to as a service, and the service interactions are defined using a description language. Each interaction is self-contained and loosely coupled, so that each interaction is independent of any other interaction.

Simple Object Access Protocol (SOAP)-based Web services are becoming the most common implementation of SOA. However, there are non-Web services implementations of SOA that provide similar benefits. The protocol independence of SOA means that different consumers can use services by communicating with the service in different ways. Ideally, there should be a management layer between the providers and consumers to ensure complete flexibility regarding implementation protocols.

7. Pervasive computing

Pervasive computing is the trend towards increasingly ubiquitous, connected computing devices in the environment, a trend being brought about by a convergence of advanced electronic-and particularly, wireless-technologies and the Internet. Pervasive computing devices are not personal computers as we tend to think of them, but very tiny-even invisible-devices, either mobile or embedded in almost any type of object imaginable, including cars, tools, appliances, clothing and various consumer goods-all communicating through increasingly interconnected networks. According to Dan Russell, a researcher at IBM's Almaden Research Center, by 2010 computing will have become so naturalized within the environment that people will not even realize that they are using computers. Russell and other researchers expect that in the future smart devices all around us will maintain current information about their locations, the contexts in which they are being used, and relevant data about the users.

The goal of researchers is to create a system that is pervasively and unobtrusively embedded in the environment, completely connected, intuitive, effortlessly portable, and constantly available. Among the emerging technologies expected to prevail in the pervasive computing environment of the future are wearable computers, smart homes and smart buildings. Among the myriad of tools expected to support

these are: application-specific integrated circuitry (ASIC);speech recognition; gesture recognition; system on a chip(SoC); perceptive interfaces; smart matter; flexible transistors; reconfigurable processors; field programmable logic gates(FPLG); and microelectromechanical systems(MEMS).

8. location-based services

Location-based services (LBS) are services that exploit knowledge about where an information device user is located. For example, the user of a wireless-connected smartphone could be shown ads specific to the region the user is traveling in. Location-based services exploit any of several technologies for knowing where a network user is geographically located. One is the Global Positioning System (GPS). A second approach is E911, an initiative of the Federal Communications Commission (FCC) that requires wireless carriers to pinpoint a caller's telephone number to emergency dispatchers. E911 also ensures that carriers will be able to provide call locations from wireless phones. E911 is the most widely used location-based service in the U.S.

9. grid computing

Grid computing is applying the resources of many computers in a network to a single problem at the same time usually to a scientific or technical problem that requires a great number of computer processing cycles or access to large amounts of data. Grid computing requires the use of software that can divide and farm out pieces of a program to as many as several thousand computers. Grid computing can be thought of as distributed and large-scale cluster computing and as a form of network-distributed parallel processing. It can be confined to the network of computer workstations within a corporation or it can be a public collaboration (in which case it is also sometimes known as a form of peer-to-peer computing).

10. virtualization

In information technology, virtualization has several meanings.

(1) With computer hardware, virtualization is the use of software to emulate hardware or a total computer environment. This kind of software is sometimes known as a virtual machine. A virtual machine may exist in a computer that is also running programs that are natural to that computer and not part of the virtual machine.

(2) Relative to computer memory, virtualization is the use of software to allow a program to address a much larger amount of memory than is actually available. This is generally done by swapping units of address space back and forth as needed between a storage device and memory. Such memory is known as virtual memory.

(3) In computer storage management, virtualization is the pooling of physical storage from multiple network storage devices into what appears to be a single storage device that is managed from a central console.

Words and Expressions

microcommerce　n. 微观商业

desktop search 桌面搜索
OLED (organic light-emitting diodes) 有机发光二极管，有机发光显示器
light-emitting diodes (LEDs) 半导体发光二极管
FOLED (flexible organic light-emitting display) 挠曲式有机发光二极体，柔软显示器
Linux n. 一个自由操作系统，一种可免费使用的类 UNIX 操作系统，运行于一般的 PC 机上
Instant messaging (sometimes called IM) （网上的）即时通信（服务）
service-oriented architecture (SOA) 面向服务的架构，面向服务的体系结构
Simple Object Access Protocol (SOAP) 简单对象访问协议，简单对象存取协议
pervasive computing 普及运算，遍布式计算
Location-based services (LBS) 基于位置的服务，定位服务
Smartphone n. 智能手机，智慧型手机，智能电话
Global Positioning System (GPS) 全球定位系统，全球卫星定位系统
Federal Communications Commission (FCC) 美国联邦通信委员会
grid computing 网格计算，网格运算
cluster computing 集群计算
virtualization n. 虚拟化，虚拟化技术