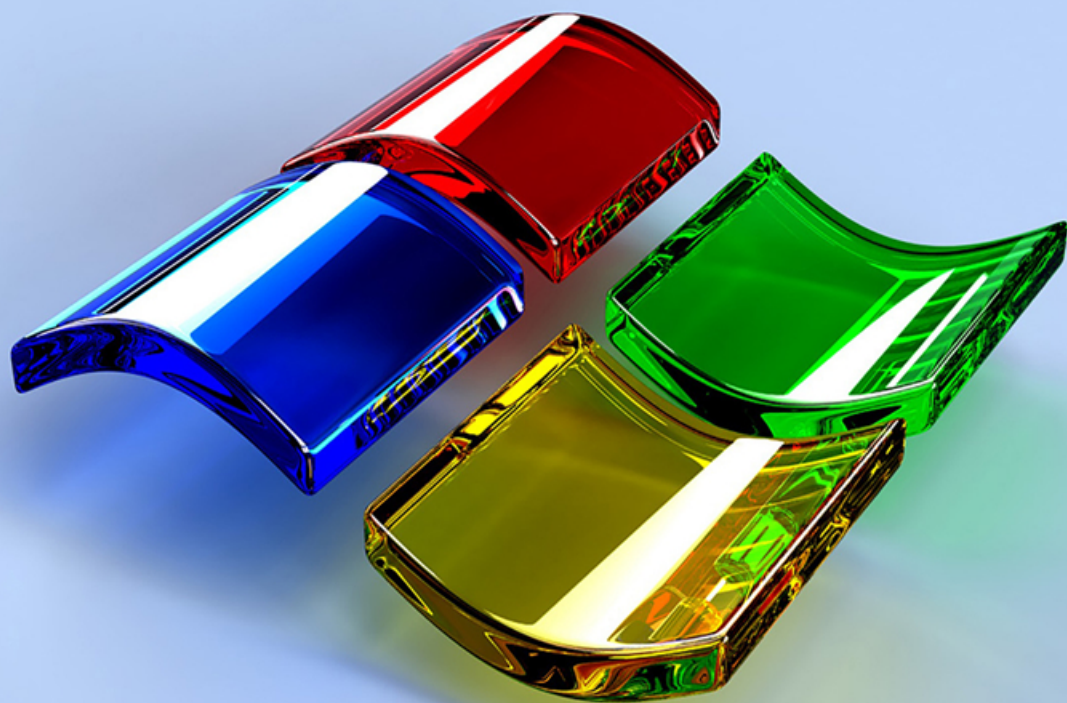


А.В. Иванов

Science and Technology



Ижевск, 2014

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А.В.Иванов

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Предисловие

Владение иностранным языком выпускниками вузов подготовки по разным направлениям востребовано в современном мире в связи с расширением межкультурных контактов, международной экономической и образовательной интеграции, мобильности и распространением научно-технических знаний.

Актуальность данного учебно-методического пособия обусловлена необходимостью научно-методического сопровождения этого инновационного процесса, так как имеющаяся учебно-методическая литература по направлению подготовки «Информационные системы» малочисленна и не соответствует требованиям ФГОС ВПО.

Данное учебное пособие рекомендуется использовать как для аудиторной, так и для внеаудиторной работы студентам бакалавриата вторых и третьих курсов очной формы обучения, обучающихся по направлениям подготовки «Информатика и вычислительная техника», «Информационные системы и технологии», «Фундаментальная информатика и информационные технологии», на занятиях научно-технического перевода, у студентов, получающих дополнительную квалификацию «Переводчик в сфере профессиональной коммуникации».

Пособие отражает лексические и грамматические явления, вызывающие затруднения при чтении научно-технической литературы на английском языке; тексты сопровождаются системой языковых и речевых упражнений, направленных на развитие навыков чтения, понимания, обсуждения, реферирования, перевода специализированных текстов, расширение словарного запаса по темам связанным с различными аспектами сферы компьютерных технологий.. Каждый текст сопровождается упражнениями, словами и выражениями, подлежащими активизации.

Теоретический компонент представлен заданиями для самостоятельной работы студентов. Тексты подобраны с учётом профиля специальности, отличаются актуальностью и высокой информативностью.

Целью пособия является формирование речевых компетенций, навыков устного и письменного общения на английском языке в сфере ИТ, перевода, реферирования, резюмирования, поискового и ознакомительного чтения оригинального англоязычного материала; формирование навыков понимания сообщений компьютера, спецификаций и руководств по применению программных и аппаратных средств; умения беседовать на профессиональные темы, развитие умения читать специальную литературу разной степени сложности и извлекать из неё информацию.

Пособие состоит из 10 учебных блоков и глоссария, включающего акронимы и аббревиатуры, принятые в научно-технической литературе и в области информатики.

В построении учебных указаний учтены современные требования методических концепций для учебников по иностранным языкам. Специальная терминология соответствует ключевым понятиям профессионального языка с сфере ИТ..

Автор

GRAMMAR EXERCISES

I. Put the plurals into the correct pronunciation column.

databases	passwords	laptops	graphs
orders	switches	taxes	networks
tables	packages	spreadsheets	systems

/s/	/ɪz/	/z/

II. Complete these sentences using the comparative form of the adjective in brackets.

1. A laser printer is generally (quiet) _____ than a low-cost inkjet printer.
2. Multi-function printers are now only slightly (expensive) _____ than conventional printers, and offer much (great) _____ versatility.
3. The print quality of this network printer is noticeably (good) _____ than any inkjet, and as (good) _____ as similar laser printers.
4. The Agfa platesetter is (reliable) _____ and (easy) _____ to use than most printers of its type.
4. Your printer is only as (good) _____ as the paper you use.
5. The final result is always (accurate) _____ than the original image.
6. An imagesetter is (heavy) _____ than a laser printer.

III. Complete these sentences with the superlative form of the adjectives in brackets.

1. Always buy the (fast) _____ scanner with the (high) _____ resolution you can afford.
2. They have created the (revolutionary) _____ camera to date.

3. FotoFinish is the (easy) _____ photo editing software for your digital camera.
4. This scanner gives you the (good) _____ scans with the _____ (little) effort.
5. Our university has bought the (modern) _____ computer equipment.

IV. Choose the correct words in brackets to complete these sentences.

1. In the future, I hope we ('ll have / 're going to have) robots in the home to help us with the housework.
2. Hey, Nick, be careful, you ('re going to spill / 'll spill) that coffee on the computer!
3. It's John's birthday next week. We ('ll give / 're going to give) him a mobile phone.
4. - My laptop has crashed!
- Don't worry. I ('ll lend / 'm going to lend) you mine.
5. The Internet (will probably change / is probably going to change) the publishing industry in the way that TV changed the movie industry.
6. Futurists predict that smart technology (will be / is going to be) incorporated into fabrics, so you'll be able to email from your coat!

V. Complete these sentences with the adverbial form of the words in brackets.

1. Simulation games are (wide) used in both universities and businesses.
2. Massively multiplayer online RPGs have (recent) become more popular, mainly due to faster internet connections.
3. Strategy is a genre (main) restricted to PC.
4. Video games often come with a clear set of motivation tools, such as scores and moving to higher levels when a player performs (good).

5. Cheap PCs don't process data (fast) enough to support high-end games.

VI. Are the words in bold adjectives or adverbs? Write *adj* or *adv*.

1. Atari's platform was the most popular **early** video game console, and many developers emulated Atari games to attract customers.
2. The chess game ended **early**, at the 24th move.
3. On the TPS Report gaming blog, you will find reviews, a forum and a **monthly** podcast.
4. The podcast is broadcast **monthly**.
5. You have to work **hard** to succeed in the gaming industry.
6. Some experts say that **hard** work makes people happy.

VII. Complete each sentence using the correct preposition.

1. The CPU is a large chip _____ the computer.
2. Data always flows _____ the CPU _____ the address bus.
3. The CPU can be divided _____ three parts.
4. Data flows _____ the CPU and memory.
5. Peripherals are devices _____ the computer but linked _____ it.
6. The signal moves _____ the VDU screen _____ one side _____ the other.
7. The CPU puts the address _____ the address bus.
8. The CPU can fetch data _____ memory _____ the data bus.

VIII. The artist is being interviewed. Make questions to match his answers. Use the correct form of the Past simple or Present perfect, whichever is correct.

For example:

Question: What did you do yesterday!

Answer: Worked on the computer.

Q What...

A Worked on a CD of my paintings.

Q How many...

A About a third.

Q What...

A I destroyed them.

Q How...

A I scanned them in.

Q How...

A I've organised them into themes.

Q Have...

A Yes, I've added a sound track.

Q How long ...

A It's taken me about a week.

Q When ...

A I started about ten years ago.

Q What...

A Before I had a computer, I had to use slides.

Q Have...

A Yes, I've sold a few.

IX. Use the correct form of an adverb (Present Participle or Past Participle).

1. A computer virus is a computer program (written/writing) to alter the way a computer operates.
2. Multipartite viruses come in through (infected/infecting) media and reside in memory.
3. With the (increased/increasing) capabilities of macro languages in applications, macro viruses are major threats.
4. The user often finds the banners (annoying/annoyed).
5. Trojans can also open back doors so that computer hackers can gain access to passwords and other personal information (storing/stored) on a computer.

6. The first PC virus was a boot sector virus (calling/called) Brain, created in 1986 by two brothers, Basit and Amjad Farooq Alvi from Pakistan.
7. Traditional computer viruses emerged in the 1980s, (driven/driving) by the spread of personal computers.
8. If a user tries to start an (infecting/infected) program, the virus code may be executed first.
9. Some viruses try to avoid detection by killing the tasks (associated/associating) with antivirus software before it can detect them.
10. As computers and operating systems grow larger and more complex, old hiding techniques need to be (updated/updating) or (replaced/replacing).

X. Find out this information from your partner. Make sure you use the correct tense in your questions.

For example: download music from the Internet [what site]

A Have you ever downloaded music from the Internet?

B What site did you use?

- | | | |
|---|-------------------------------|------------------|
| 1 | send a video email attachment | [who to, when] |
| 2 | fit an expansion card | [which type] |
| 3 | replace a hard disk | [what model] |
| 4 | fix a printer fault | [what kind] |
| 5 | make your own website | [how] |
| 6 | have a virus | [which virus] |
| 7 | watched TV on the Internet | [which station] |
| 8 | write a program | [which language] |

XI. Using the words from the right, answer the Past Perfect questions:

Up to the time the first digital computer was completed in 1944:

- | | |
|---|--|
| 1. What had people used to count or calculate? | |
| 2. How had letters been written? | a. secretaries |
| 3. How had companies stored information? | b. data protection |
| 4. How had information been exchanged? | c. by mail or phone |
| 5. How had office clerks processed information? | d. fingers or mechanical devices |
| 6. What hadn't people had big problems with? | e. the development of "intelligent" machines |
| 7. What had industrial productions required? | f. on mechanical type-writers |
| 8. What had only a few people considered possible? | g. any computer knowledge |
| 9. Who hadn't had the possibility to correct texts immediately? | h. far more labour |
| 10. What hadn't blue collar workers needed? | i. quite slowly |
| | j. on large quantities of paper |

XII. Complete these sentences with the word in brackets and one of these noun suffixes: *-tion, -er, -ing, -logy, -ness*. Use a dictionary to help you.

1. Kodak is a (manufacture) _____ of photographic and imaging equipment.
2. To avoid red eyes, use the camera's red eye (reduce) _____ feature.

3. (Crop) _____ a photograph means cutting out the parts of an image you don't need.
4. The (sharp) _____ of a photograph is a combination of resolution and acutance - the ability to represent clear edges.
5. Digital (techno) _____ is evolving so rapidly that some cameras have a resolution of 12 megapixels - that's 12 million pixels.

XIII. Write sentences similar in meaning to each of these predictions with It in subject position.

For example:

I don't think we'll use cable connections in future. (unlikely)
 It's unlikely that we'll use cable connections in future.

1. I'm sure we won't use magnetic tape. (certain)
2. We may well have electronic chips in our bodies. (probable)
3. Computers could easily be used to develop other computers. (likely)
4. I don't think we'll replace teachers with robots. (unlikely)
5. There's a chance we'll develop alternatives to silicon. (possible)
6. I really don't think we'll have replaced the motor car before 2020. (very unlikely)
7. I'm almost sure we'll replace the CRT monitor in the next few years. (highly probable)
8. I'm definite we'll have more virtual personalities on the Web. (certain)
9. We might adopt Bluetooth as a standard for wireless applications. (possible)
10. Doctors may be able to operate on patients at a distance. (quite likely)

XIV. Correct one mistake in each of these sentences.

1. The Ulysses SD is a power, expandable computer that offers high-end graphics at a low price.
2. A laptop is likely to be more expensive than the equivalent desktop, but a laptop is less practical if you travel a lot.
3. Where's the storage capacity of the hard drive?
4. I'm looking a desktop PC that has good graphics for games.
5. Do you need the help?
6. And how many does the PDA cost?
7. This workstation is a Pentium processor with dual-core technology, 1,024 gigabytes of RAM, and 1 terabyte of disk space.

XV. Complete this text with a, an, the or nothing.

Linux is (1) _____ operating system and it was initially created as (2) _____ hobby by a young student, Linus Torvalds, at the University of Helsinki in Finland. Version 1.0 of the Linux Kernel was released in 1994. (3) _____ Kernel, at the heart of all Linux systems, is developed and released under GNU General Public License, and its source code is freely available to everyone.

Apart from the fact that it's freely distributed, (4) _____ Linux's functionality, adaptability and robustness has made it the main alternative for proprietary Unix and Microsoft operating systems. IBM, Hewlett-Packard and other giants of the computing world have embraced Linux and support its ongoing development. More than (5) _____ decade after its initial release, Linux is being adopted worldwide, primarily as (6) _____ server platform. Its use as a home and office desktop operating system is also on the rise. The operating system can also be incorporated directly into (7) _____ microchips in a process called (8) _____ embedding, and it is increasingly being used this way in appliances and devices.

The Kernel provides a way for software and other parts of the OS to communicate with hardware.

XVI. Read the article and underline all the examples of the passive. What tenses are they?

A HACKER has been sent to jail for fraudulent use of credit card numbers. Nicholas Cook, 26, was arrested by police officers near a bank cashpoint last month.

Eight months earlier, he had been caught copying hundreds of computer programs illegally. After an official inquiry, he was accused of software piracy and fined J5,000.

It is reported that in the last few years Cook has been sending malware (malicious software) to phone operators and attacking mobile phones to steal business and personal information. Cook has now been sentenced to three years in prison for stealing passwords and obtaining money by credit card fraud.

Government officials say that new anti-hacking legislation will be introduced in the EU next year.

XVII. Complete these sentences with the passive form of the verbs in brackets.

1. Microprocessors (make) of silicon.
2. Call centres (use) to deal with telephone enquiries.
3. In recent years, most mobile phones (equip) with Bluetooth.
4. GPS (develop) in the 1970s as a military navigation system.
5. Sorry about the mess - the computers (replace) at the moment.
6. In the near future, the Internet (access) more frequently from PDAs and mobile phones than from desktop computers.
7. Networks (can connect) via satellite.
8. I had to use my laptop this morning while my PC (fix).

XVIII. The prefixes e- and cyber-

The e-prefix means electronic, and we add it to activities that take place on computers or online, for example **e-business/e-commerce** – business conducted over the Internet. Other ex-

amples include: **e-card, e-learning, e-zine, e-voting, e-signature, e-assessment, e-cash, e-book and e-pal.**

The **cyber-** prefix comes from cybernetics, and we use it to describe things related to computer networks, for example **cyber-cafe**- an internet cafe. Other examples include: **cybercrime, cyberculture, cyberslacker and cyberspace.**

Complete these sentences.

1. A ____ is an employee who uses his company's internet connection during work hours to chat with friends, play games, etc.
2. An ____ is a postcard sent via the Internet.
3. An ____ is a small magazine or newsletter published online.
4. In a ____ you can use computers with internet access for a fee.
5. Examples of ____ include internet fraud, digital piracy, theft of confidential information, etc.
6. In the future, all elections will be carried out using ____.
7. You can now sign legal documents online using an ____.
8. ____ will revolutionise the way we take exams.
9. ____ can be used on some websites instead of real money to make purchases.
10. An ____ is like the paper version, but in digital form.

IXX. Complete these sentences with the correct form of the verbs in brackets.

1. If you (bring) your digital video camera, we can make a movie on my PC.
2. You won't be able to play those video files if you (not have) the correct plug-in.
3. If the marketing manager (have) PowerPoint, she could make more effective presentations.
4. If I could afford it, I (buy) a new game console.
5. If I had the money, I (invest) in some new multimedia software.

XX. Fill in the gaps with the correct prefix from the following list.

auto	de	dec	inter
maxi	mega	micro	mini
mono	multi	semi	sub

1. Most people prefer a colour screen to a ____ chrome screen.
2. ____ script is a character or symbol written below and to the right of a number or letter, often used in science.
3. A ____ byte equals approximately one million bytes.
4. Once you finish your program, you will have to test it and ____ bug it to remove all the mistakes.
5. The introduction of ____ conductor technology revolutionized the computer industry.
6. If a computer system has two or more central processors which are under common control, it is called a ____ processors system.
7. The ____ imal system is a number system with a base of 10.
8. When the user and the computer are in active communication on a graphics system, we refer to this as ____ active graphics.

XXI. Choose the correct word to complete each sentence. You may have to change some words slightly.

electron, electronic, electronics, electronically

- a) An ____ pen is one example of an input device.
- b) A computer solves problems ____.
- c) Many ____ students go on to work as engineers.

technology, technological, technologically, technologist

- a) The computer is the greatest ____ invention of the twentieth century.
- b) There are two ____ involved in a clipboard PC.

c) Today's computers are _____ far superior to those used a few years ago.

compute, computing, computation, computerize, computerization

a) The _____ of the manufacturing division will be expensive in the short term, but cost-effective in the long term.

b) We should be able to _____ our profit for next year fairly accurately with the new program.

c) I could tell from all the _____ on the board that a math's lesson was in progress.

depend, depending, dependent, dependence, dependable, dependably

a) The company has supplied us _____ for over ten years.

b) We have to reduce our _____ on imported goods.

c) This is very _____ equipment. We have never had a serious breakdown.

d) Today, many companies _____ more on FAXes than on mail.

connect, connected, connecting, connector, connectivity, connection.

a) _____ is an important concept in global communications.

b) He only got that contract because he has _____ in the government.

c) Make sure the _____ is not loose before you call a service technician.

d) Once the new telephone lines are _____, our system should be more efficient.

XXII. Complete the sentences with words from the boxes.

program programming programmable programmers

- a) _____ is the process of writing a program using a computer language.
- b) A computer _____ is a set of instructions that tells the computer how to do a specific task.
- c) Most computers _____ make a plan of the program before they write it.
- d) A _____ keyboard allows the user to configure the layout and meaning of the keys.

compile compiler compilation

- a) Programs written in a high-level language require _____ - that is, translation into machine code, the language understood by the processor.
- b) A source program is converted into machine code by software called a _____.
- c) Programmers usually _____ their programs to generate an object program and diagnose possible errors.

bug debug debugger debugging

- a) Any error or malfunction of a computer program is known as a _____.
- b) A _____ is a program used to test and _____ other programs.
- c) The process of going through the code to identify the cause of errors and fixing them is called _____.

VOCABULARY EXERCISES

I. Which word is different? Can you find a word or expression that names all the others?

Examples:

Mouse Monitor Keyboard Scanner

Monitor is different. The others are all input devices.

- | | | | | |
|-----|----------|------------|-----------|--------------|
| 1) | Firefox | Opera | Chrome | Firewall |
| 2) | CPU | RAM | HDD | QIP |
| 3) | Rootkits | Worms | Trojans | Archivator |
| 4) | Dr. Web | avast! | Kaspersky | EasyRecovery |
| 5) | .wav | .mp3 | .wma | .gif |
| 6) | Google | Yandex | Yahoo | Norton |
| 7) | Windows | MS-DOS | UNIX | Postgre |
| 8) | FORTTRAN | FAT | PASCAL | ASSEMBLER |
| 9) | Cyborg | automation | sentry | android |
| 10) | .avi | .wmv | .bmp | .mkv |
| 11) | Scanner | Monitor | Printer | Projector |

II. Decide what these kinds of computer crime are. Then match the crimes to the short descriptions which follow.

- | | | | |
|----|--------------------------|---|--|
| 1. | Salami Shaving | A | Leaving, within a completed program, an illicit program that allows unauthorised - and unknown - entry. |
| 2. | Denial of Service attack | B | Using another person's identification code or using that person's files before he or she has logged off. |
| 3. | Trojan Horse | C | Adding concealed instructions to a computer program so that it will still work but will also perform prohibited duties. In other |

words, it appears to do something useful but actually does something destructive in the background.

- | | | |
|--------------------|---|---|
| 4. Trapdoors | D | Tricking a user into revealing confidential information such as an access code or a credit-card number. |
| 5. Mail bombing | E | Inundating an email address with thousands of messages, thereby slowing or even crashing the server. |
| 6. Software Piracy | F | Manipulating programs or data so that small amounts of money are deducted from a large number of transactions or accounts and accumulated elsewhere. The victims are often unaware of the crime because the amount taken from any individual is so small. |
| 7. Piggybacking | G | Unauthorised copying of a program for sale or distributing to other users. |
| 8. Spoofing | H | Swamping a server with large numbers of requests. |
| 9. Defacing | I | Redirecting anyone trying to visit a certain site elsewhere. |
| 10. Hijacking | G | Changing the information shown on another person's website. |

III. Match the words in Table A with the statements in Table B.

Table A		Table B	
A	Algorithm	1.	A common type of compression used for video data
B	I-frame	2.	A compressed video frame known as a predicted frame
C	JPEG	3.	A compressed video frame that stores changes between the frame before it and the frame after it.
D	P-frame	4.	A formula used for decompressing components of a data stream
E	B-frame	5.	A type of compression used for bit-map images
F	MPEG	6.	A compressed video frame that contains the complete image information
G	Bracketing	7.	Transmission mode in which each computer takes turns sending and receiving
H	Half-duplex	8.	Mathematical calculations based on the contents of data
I	Full-duplex	9.	Set boundaries for the beginning and end of a message
J	Checksum	10.	Transmission mode in which both computers send and receive at the same time

IV. Match the words in left column with the statements in the right column.

1.	a browser	A	the right in law to be the only producer, seller or distributor of a book, a play or a web page
2.	to click	B	to design the technical arrangement of a web page, building, garden, etc.

3. a click	C	a series of commercial, educational and governmental web pages on the Internet
4. content	D	to artistically arrange the shape or layout of something
5. to copyright	E	a series of interconnected computers and databases around the world
6. a copyright	F	a program used to view the Internet
7. to design	G	subject matter; the main idea of a book, a paper or a web page
8. a design	H	breaking a law or rule, disregarding a legal protection
9. to format	I	to determine the size, shape and form of a written document
10. a format	J	the technical arrangement of a web page, building, garden, etc.
11. infringement	K	1) the artistic shape or layout of something 2) an architectural or technical plan for something
12. Internet	L	to legally protect content with a copyright
13. to lay out	M	1) to press the button on a computer mouse 2) to make a small, sharp sound
14. a layout	N	the size, shape and form of a written document
15. World Wide Web (Web)	O	1) the pressing of the mouse button 2) a small, sharp sound

V. Match the definition with the correct spelling word.

- | | |
|-------------|--|
| 1. computer | a) information or instructions put into a computer |
| 2. mouse | b) device that prints, especially one operated |
| 3. memory | |

- | | |
|---------------|--|
| 4. hardware | by a computer |
| 5. input | c) the basic unit of information in an electronic computer, equivalent to a choice between two possibilities, such as "yes" or "no" |
| 6. software | |
| 7. output | d) an electronic machine that can store, recall, or process information |
| 8. disk | |
| 9. processor | e) information put out by or delivered by a computer |
| 10. menu | |
| 11. bit | f) an extremely large computer network, including many smaller networks of university, government, business, and private computers, linked by telephone lines |
| 12. data base | |
| 13. chip | g) a movable mark on a computer display screen, indicating the point at which the displayed data may be altered or processed, or at which new data may be inserted |
| 14. file | |
| 15. Internet | h) system of storing information in a computer on magnetic tape, etc.; storage |
| 16. e-mail | |
| 17. printer | i) a small piece of semiconductor material, usually silicon, which holds an integrated circuit |
| 18. monitor | |
| 19. cursors | j) the central processing unit of a computer, especially the part of this unit in which data are examined, compared, changed, etc. |
| 20. virus | |

VI. Match the sentence beginnings (1-6) with the correct endings (A-F).

- | | | |
|------------------------|---|-------------------------------|
| 1. The CPU processes | A | areas within the CPU. |
| data and | | |
| 2. The control unit is | B | you can't make changes to it. |
| the part of the CPU | | |
| that | | |

- | | | |
|--|---|---|
| 3. The arithmetic and logic unit is able to make | C | controls the way instructions are executed. |
| 4 The registers are high-speed storage | D | the computer is turned off. |
| 5 Data contained in RAM is lost when | E | coordinates the other parts of the computer. |
| 6 ROM memory can only be read: | F | calculations: add, subtract, multiply and divide. |
| 7 Operating systems control and manage | G | the use of hardware devices such as the printer or mouse. |

VII. Study these approved domain name extensions and their meanings. Then match these suggestions for new extensions to their meanings.

Extension	Meaning
.aero	aviation industry
.biz	businesses
.com (.co in UK)	commercial
.coop	cooperatives
.edu (.ac in UK)	educational and research
.gov	government
.info	general use
.int	international organisation

.mil	military agency
.museum	museums
.name	individuals
.net	gateway or host
.org	non-profit organisation
.pro	professionals

Suggested extension

Meaning

- | | | |
|-----------|---|---------------------------|
| 1. .firm | A | informative |
| 2. .store | B | cultural or entertainment |
| 3. .web | C | personal |
| 4. .arts | D | firm or agency |
| 5. .rec | E | online retail shop |
| 6. .info | F | Web-related |
| 7. .nom | G | recreational |

VIII. Match each word from Column A with its partner from Column B to make a computing term.

Column A

- barcode
- mainframe
- laser

Column B

- tray
- program
- bus

- | | |
|---------------|-------------|
| 4. expansion | d) pane |
| 5. floppy | e) computer |
| 6. control | f) reader |
| 7. supervisor | g) bar |
| 8. task | h) card |
| 9. system | i) drive |
| 10. explore | j) printer |

IX. Complete these instructions for how to Copy and Paste in Word with verbs from the box.

click (x2)	select	position	right-click	drag
------------	--------	----------	-------------	------

First, _____ the text you wish to copy. To select text, _____ the mouse over the portion of the text that you want to copy. This part should then be highlighted.

Then _____ on the *Copy* icon on the Standard Toolbar. This copies the selected text to an invisible clipboard.

Next, _____ the cursor where you want the text to appear.

Finally, _____ the *Paste* icon. This inserts the content of the clipboard at the insertion point. As well as the icons on the toolbar, you can use the keys *Ctrl+C* for *Copy*, and *Ctrl+V* for *Paste*. These options also come up if you _____ the selected text.

X. All, except one, were invented in 1986. Which one, in your opinion, hadn't been invented by then? Why not?

a laser system

powered by solar cells;

a picture-painting computer

which will record and play

	back melodies;
a robot	timed to brush for exactly one minute;
a computer	that can play table tennis;
a car	for curing heart disease without surgery;
an electric toothbrush	which can converse like a human being;
a computer watch	for writing under water;
a pen	which also stores an appointments diary;
a "teaching" piano	using 17 million colour.

XI. Using words from the list, fill in the blanks with the correct answers:

memory	computer(s)	information	skill
operator(s)	instructions	paper	printers
upperlevel	build	machine	engineers
design	reports	responsibility	
training	programmer(s)		

1. A computer is a _____ that stores _____ for later use and processes that _____ on demand.
2. A computer worker's main _____ is to make sure _____ can be processed on the _____ when the customer needs it.
3. Those who _____ and _____ new computers are _____.

4. Most people working with computers are either _____ or _____.
5. A computer _____ is the one who actually runs a _____.
6. The computer _____ is the person who tells the _____ how work.
7. Computer programmers take more _____ and need more _____ than computer operators.
8. As an educational minimum, any _____ worker should be an _____ graduate.
9. A programmer must continue to be updated on new _____ and _____.

XII. Make a list of computing terms.

1. An input device that is moved around the desk top to control the position of the cursor on the display screen.
2. A list of things to choose from, shown by a computer to the user.
3. A televisionlike screen to receive information from the computer.
4. A computer program that is designed to replicate itself by copying itself into the other programs stored in a computer (often with a negative effect).
5. A large collection of information, organized and kept and made available by a computer or computers including such items as newspaper stories, airplane schedules, or inventory lists.
6. Information or instructions which a computer keeps together under a single name.
7. The transmission of messages and other information from one computer to another, usually via a network or telephone lines.
8. An object like a phonograph record, made of metal or plastic and with a magnetic surface, used to store information and instructions for computer.

9. The computer's machinery - the parts you can see and touch, like the monitor and all the electronic devices and circuits inside it.

10. All the facts and the lists of instructions that a computer receives in order to carry out its tasks.

XIII. A. Rewrite this IM chat, using full forms instead of abbreviations.

Sue BTW, where r u going for ur holiday?
By the way, where are you going for your holiday?

Abby Girona. Have u been?

Sue Yes. I went 2 Girona last summer.

Abby Did u have a good time?

Sue It's great, IMO. How r u going 2 travel?

Abby We're flying.

Sue Where r u staying?

Abby In a youth hostel.

Sue IC. IOW, the cheapest place possible!

Abby LOL! Yes. BTW, any recommendations?

Sue Let me think. I'll send u amsg ASAP.

Abby TIA!

Sue Got2go.BFN!

B. Rewrite this IM chat using abbreviations.

Paulo By the way, are you free on Saturday?

Emma Sure - it would be good to meet face to face. Shall we go for a coffee?

Paulo Good plan. Cafe Moka makes the best coffee, in my opinion.

Emma It's the closest to your house in other words!

Paulo Laughing out loud! Yes, you're right! But the coffee really is good.

Emma See you at 4?
Paulo Great. Bye for now.

C. Write these two text message poems in standard English.

A

txtin iz messin,
mi headn'me englis,
try2rite essays,
they all come out txtis.
gran not plsed w/letters
shes getn,
swears i wrote better
b4comin2uni.
& she's african.

Hetty Hughes

B

14: a txt msg pom.
his is r bunsn brnr bl%,
his hair lyk fe filings
w/ac/dc going thru.
I sit by him in kemistry,
it splits my @oms
wen he :-): @ me.

Julia Bird, Poetry Book Society

XIV. Find the Russian equivalents to the English word combinations.

Программа в двоичном коде; прикладная программа; программа, выполняемая в защищенном режиме; (не) совместимая программа; бесплатная программа; программа отладки; часто используемая (распространенная) программа; сервисная программа; сторожевая программа; дистанционная программа; программа моделирования; вспомогательная программа; программа для доступа (к данным); программа, работающая с базой данных; обучающая программа; универсальная программа; программа обработки данных; программа операционной системы (системная программа); выполняемая программа; сетевая /несетевая программа; самозагружающаяся программа; программа управления; программа обнаружения вирусов, заархивированная программа; программа, выполняемая с большой скоростью.

Program: access program; protected-mode program; application program; archived program; control / management program; binary program; operating (-system) program; common program; compatible / incompatible program; database program; educational / teaching / training program; free program; general-purpose program; high-performance program; off-line program; on-line program; processing program; remote program; running program; self-loading program; simulation program; debugging program; support program; utility program; virus-detection program; watch-dog program.

PROBLEM-SOLVING

I. How do you think these professions might use computers?

- architects
- interior designers
- farmers
- landscape gardeners
- musicians
- rally drivers
- sales people

II. Study these 'System upgrades and options' for the computer. Which upgrades and/or options would improve these aspects of this computer?

- a) capacity
- b) speed
- c) protection from damage due to power failure
- d) network connections

Upgrades and options

1. 3Com 10/100 Ethernet controller
2. CD-RW Drive
3. Extra memory module
4. APC 1400 Smart-UPS
5. 3 Year Next-Business-Day On-site Service

III. List as many uses as you can for computers in one of these areas.

- supermarkets
- hospitals
- airports
- police headquarters

IV. Decide which applications programs would be used and for what purpose, by the following:

- a museum
- publishers of a subscription-only magazine
- police headquarters

V. Assuming cost is not a problem, what computer applications would make today's cars safer, more comfortable, more secure and more efficient?

VI. Study this list of needs. Which type of peripheral would you advise in each case?

1. inputting printed graphics
2. building cars
3. controlling the screen cursor in a fast action game
4. making choices on a screen in a public information terminal
5. recording moving images
6. recording a book loan in a library
7. printing very high quality text and graphics
8. creating drawings
9. printing building plan drawings
10. recording sound
11. listening to music without disturbing others
12. storing programs and data
13. inputting a lot of text
14. backing up large quantities of data

VII. Work in two groups, A and B. Group A, list all the advantages of a network. Group B, list all the disadvantages. Then together consider how the disadvantages can be minimised.

1. Study these seven points for evaluating websites.

- Design
- Navigation

- Easy of use
- Accuracy
- Up to date
- Helpful graphics
- Compatibility
-

2. Evaluate any one of these sites using the seven points.

www.environment-agency.gov.uk

www.compaq.com

www.abcissa.force9.co.uk/birds

news.bbc.co.uk

3. Visit a website of your choice. Take notes on any special features. You may refer to these seven points for evaluating a site listed above, if you wish. Then make a short presentation to the class on what makes your chosen site special.

VIII. Diagnose these faults and provide advice on each problem.

1. My laser printer produces very faint copies.
2. When I print, three or four sheets come through the printer at the same time.
3. My spreadsheet does not seem to add up correctly.
4. Everything I type appears in capitals.
5. My PC is switched on but the monitor screen is blank.
6. I tried to print a document but nothing came out of the printer.
7. My monitor picture is too narrow.
8. My monitor screen flickers.
9. My mouse responds erratically.
10. The time display on my computer is one hour slow.
11. When I print out a page, the first two lines are missing.
12. My computer sometimes stops and reboots itself. The lights dim at the same time.

SPEAKING

I. Describe the functions of these items.

- | | |
|-------------------|----------------------|
| 1 scanner | 6 supercomputer |
| 2 printer | 7 mainframe computer |
| 3 ATM | 8 swipe cards |
| 4 PDA | 9 barcodes |
| 5 hard disk drive | 10 memory |

II. Find out as much as you can about your partner's computer and complete this table.

processor type	
processor speed	
bus speed	
memory (RAM)	
memory type	
hard disk capacity	
hard disk type	
monitor size	
monitor resolution	
CD-ROM drive speed	

III. One of you wants to buy a computer, the other is the shop assistant. Use the prompts below to role play the conversation.

Shop assistant

Customer

Greet the customer and offer help.

Explain what you *are* looking for.

Show the customer two possible models.

Ask for some technical specs.

Give technical specs (describe the processor, RAM and storage capacity). Compare the two different models.

Ask about any further technical specs (DVD drive, monitor, communications, etc.).

Give the information required. Compare the two models.

Ask the price.

Answer, and mention any final details that might persuade the customer to buy the computer.

Decide which computer to buy or leave the shop.

IV. In pairs, discuss who or what you think is:

- the most difficult computer game you've ever played.
- the most exciting film you've ever seen.
- the funniest programme on TV.
- the most dangerous computer virus.
- the best blogger or webmaster on the Web.
- the most popular web browser.

V. Work in pairs, A and B. Each of you has a review of a computer game. Find out from each other this information:

1. The name of the game.
2. The company who produce it.
3. The platform on which it's played.
4. The bad points.
5. The good points.
6. The star rating.

Student A your game details are on page 126.

Student B your game details are on page 127.

VI. Carry out a survey of mobile phone use amongst your classmates. Find out:

1. How many have mobile phones.
2. What they use them for.
3. What makes they have.
4. How often they use them per day.
5. What additional features their phones have, e.g.
 - a) phone book
 - b) messages
 - c) calls register
 - d) games
 - e) calculator
 - f) alarm call

VII. In pairs, discuss these questions.

1. What is a hacker?
2. How easy do you think it is to infiltrate the Internet and steal sensitive information?
3. How can you protect your computer from viruses and spyware?

VIII. Find out what the most common computing problems are for your classmates and how they get help with these problems. Use this form to record your results.

Problems	Sources of help
viruses	
monitor problems	
computer hangs	
printer problems	
computer crashes	
other	

Ask questions like these:

1. Have you ever had a problem with a virus?
2. Have you ever had a software problem?
3. What kind of problem?
4. What did you do about it?
5. How did you get help?

IX. Work in pairs. Together decide what would be the most appropriate language to use for each of these situations.

1. A schoolteacher wants his young pupils to learn some basic mathematics by controlling a simple robot.
2. The owner of a small business wants to create a simple database program to keep track of his stock.
3. An engineer wants to develop a program for calculating the stresses in a mechanical device.
4. A student wants to create webpages for a personal website.
5. A systems programmer wants to add some new modules to an operating system.
6. A programmer working for the US army wants to create a program for controlling a new type of weapon.
7. A finance company needs to process data from its branch offices on its mainframe computer.
8. A website designer wants to enable the data on his website to be easily processed by a number of different programs.
9. A student studying artificial intelligence wants to write some programs for a course project.
10. A college lecturer wants his students to learn the principles of programming.
11. A professional programmer wants to create and sell a program for use in language learning.
12. A website designer wants to password-protect a section of a website.

READING

What is a computer?

A computer is an electronic machine which can accept data in a certain form, process the data, and give the results of the processing in a specified format as information.

First, data is fed into the computer's memory. Then, when the program is run, the computer performs a set of instructions and processes the data. Finally, we can see the results (the output) on the screen or in printed form.

A computer system consists of two parts: hardware and software. **Hardware** is any electronic or mechanical part you can see or touch. **Software** is a set of instructions, called a program, which tells the computer what to do. There are three basic hardware sections: the **central processing unit (CPU)**, **main memory** and **peripherals**

Perhaps the most influential component is the central processing unit. Its function is to execute program instructions and coordinate the activities of all the other units. In a way, it is the 'brain' of the computer. The main memory (a collection of RAM chips) holds the instructions and data which are being processed by the CPU. Peripherals are the physical units attached to the computer. They include storage devices and input/output devices.

Storage devices (hard drives, DVD drives or flash drives) provide a permanent storage of both data and programs.

Diskdrives are used to read and write data on disks. **Input devices** enable data to go into the computer's memory. The most common input devices are the **mouse** and the **keyboard**. **Output devices** enable us to extract the finished product from the system. For example, the computer shows the output on the **monitor** or prints the results onto paper by means of a **printer**.

On the rear panel of the computer there are several **ports** into which we can plug a wide range of peripherals - a modem, a

digital camera, a scanner, etc. They allow communication between the computer and the devices. Modern desktop PCs have USB ports and memory card readers on the front panel.

Match these words from the text with the correct meanings.

- | | |
|--|---|
| 1. software | A the brain of the computer |
| 2. peripherals | B physical parts that make up a computer system |
| 3. main memory | C programs which can be used on a particular computer system |
| 4. hard drive
(also known as hard disk) | D the information which is presented to the computer |
| 5. hardware | E results produced by a computer |
| 6. input | F input devices attached to the CPU |
| 7. ports | G section that holds programs and data while they are executed or processed |
| 8. output | H magnetic device used to store information |
| 9. central processing unit (CPU) | I sockets into which an external device may be connected |

Computers Make the World Smaller and Smarter

The ability of tiny computing devices to control complex operations has transformed the way many tasks are performed, ranging from scientific research to producing consumer products. Tiny 'computers on a chip' are used in medical equipment, home appliances, cars and toys. Workers use handheld computing devices to collect data at a customer site, to generate forms, to control inventory, and to serve as desktop organisers. Not only is computing equipment getting smaller, it is getting more sophisticated. Computers are part of many machines and

devices that once required continual human supervision and control. Today, computers in security systems result in safer environments, computers in cars improve energy efficiency, and computers in phones provide features such as call forwarding, call monitoring, and call answering.

These smart machines are designed to take over some of the basic tasks previously performed by people; by so doing, they make life a little easier and a little more pleasant. Smart cards store vital information such as health records, drivers' licenses, bank balances, and so on. Smart phones, cars, and appliances with built in computers can be programmed to better meet individual needs. A smart house has a built-in monitoring system that can turn lights on and off, open and close windows, operate the oven, and more.

With small computing devices available for 35 performing smart tasks like cooking dinner, programming the VCR, and controlling the flow of information in an organization, people are able to spend more time doing what they often do best - being creative. Computers can 40 help people work more creatively.

Multimedia systems are known for their educational and entertainment value, which we call 'edutainment'. Multimedia combines text with sound, video, animation, and 45 graphics, which greatly enhances the interaction between user and machine and can make information more interesting and appealing to people. Expert systems software enables computers to 'think' like experts. So Medical diagnosis expert systems, for example, can help doctors pinpoint a patient's illness, suggest further tests, and prescribe appropriate drugs.

Connectivity enables computers and software that might otherwise be incompatible to communicate and to share resources. Now that computers are proliferating in many areas and networks are available for people to access data and communicate with others, personal computers are becoming interpersonal

PCs. They have the potential to significantly improve the way we relate to each other. Many people today telecommute -that is, use their computers to stay in touch with the office while they are working at home. With the proper tools, hospital staff can get a diagnosis from a medical expert hundreds or thousands of miles away. Similarly, the disabled can communicate more effectively with others using computers.

Distance learning and videoconferencing are concepts made possible with the use of an electronic classroom or boardroom accessible to people in remote locations. Vast data bases of information are currently available to users of the Internet, all of whom can send mail messages to each other. The information superhighway is designed to significantly expand this interactive connectivity so that people all over the world will have free access to all these resources.

People power is critical to ensuring that hardware, software, and connectivity are effectively integrated in a socially responsible way. People - computer users and computer professionals - are the ones who will decide which hardware, software, and networks endure and how great an impact they will have on our lives. Ultimately people power must be exercised to ensure that computers are used not only efficiently but in a socially responsible way.

I. Find the answers to these questions in the following text.

1. Name some types of devices that use 'computers on a chip'.
2. What uses of handheld computers are mentioned in the text?
3. What are the benefits of using computers with the following items?
 - a) Security systems
 - b) Cars
 - c) Phones
4. What smart devices are mentioned in the text?
5. What are smart cards used for?

6. What are the advantages of multimedia?
7. What can medical expert systems do?
8. How can computers help the disabled?
9. What types of computing systems are made available to people in remote locations using electronic classrooms or board-rooms?
10. What aspects of computing can people power determine?

II. Re-read the text to find the answers to these questions:

1. Match the terms in Table A with the statements in Table B.

Table A		Table B
A Edutainment	1	Software that enables computers to 'think' like experts
B Multimedia	2	Use computers to stay in touch with the office while working at home
C Expert system	3	Internet system designed to provide free, interactive access to vast resources for people all over the world
D Telecommute	4	Multimedia materials with a combination of educational and entertainment content
E Information superhighway	5	A combination of text with sound, video, animation, and graphics

2. Mark the following statements as True or False:

- a. Desktop organisers are programs that require desktop computers.
- b. Computers are sometimes used to monitor systems that previously needed human supervision.
- c. Networking is a way of allowing otherwise incompatible systems to communicate and share resources.
- d. The use of computers prevents people from being creative.

e. Computer users do not have much influence over the way that computing develops.

CACHE MEMORY

Most PCs are held back not by the speed of their main processor, but by the time it takes to move data in and out of memory. One of the most important techniques for getting around this bottleneck is the memory cache.

The idea is to use a small number of very fast memory chips as a buffer or cache between main memory and the processor. Whenever the processor needs to read data it looks in this cache area first. If it finds the data in the cache then this counts as a 'cache hit' and the processor need not go through the more laborious process of reading data from the main memory. Only if the data is not in the cache does it need to access main memory, but in the process it copies whatever it finds into the cache so that it is there ready for the next time it is needed. The whole process is controlled by a group of logic circuits called the cache controller.

One of the cache controller's main jobs is to look after 'cache coherency' which means ensuring that any changes written to main memory are reflected within the cache and vice versa. There are several techniques for achieving this, the most obvious being for the processor to write directly to both the cache and main memory at the same time. This is known as a 'write-through' cache and is the safest solution, but also the slowest.

The main alternative is the 'write-back' cache which allows the processor to write changes only to the cache and not to main memory. Cache entries that have changed are flagged as 'dirty', telling the cache controller to write their contents back to main memory before using the space to cache new data. A write-back cache speeds up the write process, but does require a more intelligent cache controller.

Most cache controllers move a 'line' of data rather than just a single item each time they need to transfer data between main memory and the cache. This tends to improve the chance of a cache hit as most programs spend their time stepping through instructions stored sequentially in memory, rather than jumping about from one area to another. The amount of data transferred each time is known as the 'line size'.

I. Find the answers to these questions in the following text.

1. What is one of the main causes of a PC not running at its highest potential speed?
2. What word in the text is used instead of 'buffer'?
3. What device looks after cache coherency?
4. What is the main alternative to 'write-through cache'?
5. When does a write-back cache write its contents back to main memory?
6. When is data marked as 'dirty' in a write-back cache?
7. What determines what data is replaced in a disk cache?

II. Mark the following statements as True or False:

1. Cache memory is faster than RAM.
2. The processor looks for data in the main memory first.
3. Write-through cache is faster than write-back cache.
4. Write-back cache requires a more intelligent cache controller.
5. Most programs use instructions that are stored in sequence in memory.
6. Most cache controllers transfer one item of data at a time.
7. Hardware and software disk caches work in much the same way.

III. Match the terms in Table A with the statements in Table B.

Table A	Table B
A Cache hit	1. The process of writing changes only to the cache and not to main memory unless the space is used to cache new data
B Cache controller	2. The amount of data transferred to the cache at any one time
C Cache coherency	3. The process of writing directly to both the cache and main memory at the same time
D Write-through cache	4. The processor is successful in finding the data in the cache
E Write-back cache	5. Ensuring that any changes written to main memory are reflected within the cache and vice versa
F Line size	6. The logic circuits used to control the cache process

DATA MINING

Data mining is simply filtering through large amounts of raw data for useful information that gives businesses a competitive edge. This information is made up of meaningful patterns and trends that are already in the data but were previously unseen. The most popular tool used when mining is artificial intelligence (AI). AI technologies try to work the way the human brain works, by making intelligent guesses, learning by example, and using deductive reasoning. Some of the more popular AI methods used in data mining include neural networks, clustering, and decision trees.

Neural networks look at the rules of using data, which are based on the connections found or on a sample set of data. As a result, the software continually analyses value and compares it to the other factors, and it compares these factors repeatedly until it finds patterns emerging. These patterns are known as rules. The software then looks for other patterns based on these rules or sends out an alarm when a trigger value is hit.

Clustering divides data into groups based on similar features or limited data ranges. Clusters are used when data isn't labelled in a way that is favourable to mining. For instance, an insurance company that wants to find instances of fraud wouldn't have its records labelled as fraudulent or not fraudulent. But after analysing patterns within clusters, the mining software can start to figure out the rules that point to which claims are likely to be false.

Decision trees, like clusters, separate the data into subsets and then analyse the subsets to divide them into further subsets, and so on (for a few more levels). The final subsets are then small enough that the mining process can find interesting patterns and relationships within the data.

Once the data to be mined is identified, it should be cleansed. Cleansing data frees it from duplicate information and erroneous data. Next, the data should be stored in a uniform format within relevant categories or fields. Mining tools can work with all types of data storage, from large data warehouses to smaller desktop databases to flat files. Data warehouses and data marts are storage methods that involve archiving large amounts of data in a way that makes it easy to access when necessary.

When the process is complete, the mining software generates a report. An analyst goes over the report to see if further work needs to be done, such as refining parameters, using other data analysis tools to examine the data, or even scrapping the data if it's unusable. If no further work is required, the report proceeds to the decision makers for appropriate action.

The power of data mining is being used for many purposes, such as analysing Supreme Court decisions, discovering patterns in health care, pulling stories about competitors from newswires, resolving bottlenecks in production processes, and analysing sequences in the human 65 genetic makeup. There really is no limit to the type of business or area of study where data mining can be beneficial.

I. Find the answers to these questions in the following text.

1. What tool is often used in data mining?
2. What AI method is used for the following processes?
 - a) Separate data into subsets and then analyse the subsets to divide them into further subsets for a number of levels.
 - b) Continually analyse and compare data until patterns emerge.
 - c) Divide data into groups based on similar features or limited data ranges.
3. What term is used for the patterns found by neural networks?
4. When are clusters used in data mining?
5. What types of data storage can be used in data mining?
6. What can an analyst do to improve the data mining results?
7. Name some of the ways in which data mining is currently used.

II. Mark the following as True or False:

1. Data mining is a process of analysing known patterns in data.
2. Artificial intelligence is commonly used in data mining.
3. In data mining, patterns found while analyzing data are used for further analysing the data.
4. Data mining is used to detect false insurance claims.
5. Data mining is only useful for a limited range of problems.

III. Match the terms in Table A with the statements in Table B.

Table A	Table B
A Data mining	1. Storage method of archiving large amounts of data to make it easy to access
B AI	2. Data free from duplicate and erroneous information
C Cleansed data	3. A process of filtering through large amounts of raw data for useful information
D Data warehouse	4. A computing tool that tries to operate in a way similar to the human brain

IV. Complete the following description of the data mining process using words from the text:

Large amounts of data stored in data _____ are often used for data _____. The data is first _____ to remove _____ information and errors. The _____ is then analysed using a tool such as _____. An analysis report is then analysed by an _____ who decides if the _____ need to be refined, other data _____ tools need to be used, or if the results need to be discarded because they are _____. The analyst passes the final results to the _____ makers who decide on the _____ action.

SECURITY AND PRIVACY ON THE INTERNET

There are many benefits from an open system like the Internet, but one of the risks is that we are often exposed to **hackers**, who break into computer systems just for fun, to steal information, or to spread viruses (see note below). So how do we go about making our online transactions secure?

Security on the Web

Security is crucial when you send confidential information online. Consider, for example, the process of buying a book on the Web. You have to type your credit card number into an order form which passes from computer to computer on its way to the online bookstore. If one of the intermediary computers is infiltrated by hackers, your data can be copied.

To avoid risks, you should set all security alerts to high on your web browser. Mozilla Firefox displays a lock when the website is secure and allows you to disable or delete **cookies** - small files placed on your hard drive by web servers so that they can recognize your PC when you return to their site.

If you use online banking services, make sure they use **digital certificates** - files that are like digital identification cards and that identify users and web servers. Also be sure to use a browser that is compliant with **SSL** (Secure Sockets Layer), a protocol which provides secure transactions.

Email privacy

Similarly, as your email travels across the Net, it is copied temporarily onto many computers in between. This means that it can be read by people who illegally enter computer systems.

The only way to protect a message is to put it in a sort of virtual envelope - that is, to encode it with some form of **encryption**. A system designed to send email privately is Pretty Good Privacy, a **freeware** program written by Phil Zimmerman.

Network security

Private networks can be attacked by intruders who attempt to obtain information such as Social Security numbers, bank ac-

counts or research and business reports. To protect crucial data, companies hire security consultants who analyse the risks and provide solutions. The most common methods of protection are **passwords** for access control, **firewalls**, and **encryption** and **decryption** systems. Encryption changes data into a secret code so that only someone with a key can read it. Decryption converts encrypted data back into its original form.

Malware protection

Malware (malicious software) are programs designed to infiltrate or damage your computer, for example **viruses**, **worms**, **Trojans** and **spyware**. A virus can enter a PC via a disc drive - if you insert an infected disc - or via the Internet. A worm is a self-copying program that spreads through email attachments; it replicates itself and sends a copy to everyone in an address book. A Trojan horse is disguised as a useful program; it may affect data security. Spyware collects information from your PC without your consent. Most spyware and adware (software that allows pop-ups - that is, advertisements that suddenly appear on your screen) is included with 'free' downloads.

If you want to protect your PC, don't open email attachments from strangers and take care when downloading files from the Web. Remember to update your **anti-virus software** as often as possible, since new viruses are being created all the time.

Note: Originally, all computer enthusiasts and skilled programmers were known as **hackers**, but during the 1990s, the term hacker became synonymous with **cracker** - a person who uses technology for criminal aims. Nowadays, people often use the word hacker to mean both things. In the computer industry, hackers are known as *white hats* and crackers are called *black hats* or *darkside hackers*.

I. Answer these questions.

1. Why is security so important on the Internet?
2. What security features are offered by Mozilla Firefox?

3. What security protocol is used by banks to make online transactions secure?
4. How can we protect our email and keep it private?
5. What methods are used by companies to make internal networks secure?
6. In what ways can a virus enter a computer system?
7. How does a worm spread itself?

II. Complete the puzzle.

1. Users have to enter a _____ to gain access to a network.
2. A _____ protects a company intranet from outside attacks.
3. A _____ is a person who uses their computer skills to enter computers and networks illegally.
4. _____ can infect your files and corrupt your hard drive.
5. You can download _____ from the Net; this type of software is available free of charge but protected by copyright.
6. Encoding data so that unauthorized users can't read it is known as _____.
7. This company uses _____ techniques to decode (or decipher) secret data.
8. Most _____ is designed to obtain personal information without the user's permission.

III. Find the answers to these questions as quickly as you can.

1. Which group hacked into Hotmail?
2. Who was 'The Analyser' and what did he do?
3. Which hacker was sent to jail for fraud?
4. What was the effect of the 1996 raid on Scotland Yard?
5. Which of the cases reported here involved teenagers?
6. What did hackers do to the Yahoo! website?
7. What crime was Raphael Gray accused of?

Kevin Mitnick is the hackers' hero. His latest spell in jail was a 46-month sentence for fraud relating to breaking into the systems of several multinational corporations. He was released on condition that he did not have any contact with a computer.

Hotmail, Microsoft's free email service, was hacked into last September, exposing the correspondence of more than 40m users. A group calling itself Hackers Unite posted a Web address with details of how to access any Hotmail account. The service was shut down for five hours.

In March 2000, a Welsh teenager allegedly stole information from more than 26,000 credit card accounts across Britain, the US, Japan, Canada and Thailand, and published the details on the Internet. FBI agents and British police raided the home of Raphael Gray, 18, and arrested him and his friend. He has been charged with 10 counts of downloading unauthorised information.

The UK Department of Trade and Industry has twice been prey to hackers, once in 1996 and again in 2000 when a DTI computer was programmed to reroute email. The Home Office investigated nine cases of hacking last year, one of which was the leaking of a report on a murder. In August 1996 hackers ran up a £1m phone bill for Scotland Yard but did not access files.

In 1998 Washington revealed that an Israeli hacker called 'The Analyser' was responsible for 'the most organised attempt to penetrate the Pentagon's computer systems'. He turned out to be Ehud Tenenbaum, 18, who had planted a list of his own passwords in the Pentagon system and passed them to other hackers.

In 1997 hackers got into the Yahoo! website, replacing the homepage with a ransom note demanding the release of their hero, Kevin Mitnick. Unless the demand was met, the note said, a virus would be released in all Yahoo!'s computers. The company dismissed the threat as a hoax, but the 'Free Kevin' slogan continued to appear on other hijacked sites.

In 1997 the son of a fraud squad detective walked free from a court in London after charges of breaching the security of the US air force were dropped. Three years earlier Mathew Bevan, then 19, and a friend, Richard Pryce, 16, used the Internet to gain access to several US military bases. Pryce was fined £1,200 after admitting several other offences.

DATABASES

A **database** is a collection of related data, and the software used in databases to store, organize and retrieve the data is called the **database management system**, or **DBMS**. However, we often use the word *database* to cover both meanings. A database can manage any type of data, including text, numbers, images, sound, video and hyperlinks (links to websites).

Information is entered into the database via **fields**. Each field holds a separate piece of information, and the fields are grouped together in **records**. Therefore, a record about an employee might consist of several fields which give their name, address, phone number, date of birth, salary and length of employment with the company.

Records are grouped together into **files** which hold large amounts of information. Files can easily be **updated**-you can always change fields, add new records or delete old ones. An electronic database is much faster to consult and update than a card index system and occupies a lot less space. With the right software, you can keep track of stock, sales, market trends, orders and other information that can help your company stay successful.

A database program lets you create an **index** - a list of records ordered according to the content of certain fields. This helps you to **search** the database and **sort** records into numerical or alphabetical order very quickly. Modern databases are **relational** - that is, they are made up of related files: customers and orders, vendors and purchases, students and tutors, etc. Two database files can be related as long as they have a common field. This key field can be used to relate the two files. Databases like Oracle, DB2 and MySQL can manage these relationships.

A database **query** function allows you to extract information according to certain conditions or criteria. For example, if a managing director wanted to know all the customers that spend more than €8,000 per month, the program would search on the name field and the money field simultaneously.

The best database packages also include **network** facilities, which can make businesses more productive. For example, managers of different departments can have direct access to a common database. Most aspects of the program can be protected by user-defined passwords and other **security devices**. For

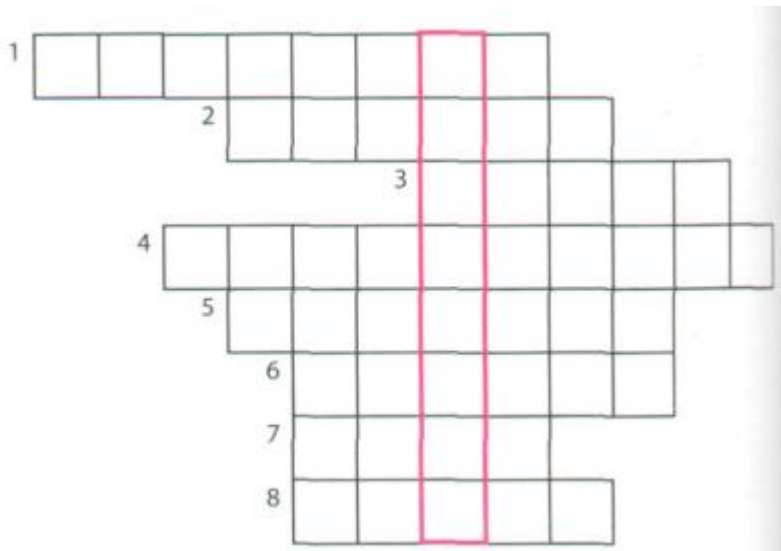
example, if you wanted to share an employee's personal details but not their commission, you could protect the commission field.

I. Complete these statements about databases using information from the text.

1. A database management system is used to _____.
2. Information is entered into a database via _____.
3. Each field holds _____.
4. Updating a file means _____.
5. Some advantages of a database program over a manual filing system are: _____.
6. Access to a common database over a network can be protected by using _____.

II. Solve the clues and complete the puzzle.

1. A collection of data stored in a PC in a systematic way.
2. A unit of a database file made up of related fields.
3. A single piece of information in a record.
4. A _____ database maintains separate, related files, but combines data elements from the files for queries and reports.
5. Some companies have several computers sharing a database over a _____.
6. To look for specific information, for example the name of an employee.
7. To classify records into numerical or alphabetical order.
8. A tool that allows you to extract information that meets certain criteria.



III. Each of following comments is followed by two paraphrases. Decide which paraphrase (a or b) is closer in meaning to the original comment.

1. 'Developers have to cut through a jungle of computer languages, operating environments, and shifting standards...'
 - a. The huge number of languages, environments, and standards makes life difficult for software developers.
 - b. Software developers have to act to reduce the number of languages, environments, and standards which currently exist.
2. 'Their comments reveal some common and diverse themes.'
 - a. They talk about ordinary and wide-ranging topics.
 - b. They agree about some issues, but disagree about others.
3. 'I think most of the major software manufacturers are able to read the market quite well.'
 - a. Most software manufacturers understand what consumers want.
 - b. Most software manufacturers know how to influence users to buy more of their products.

4. 'It seems that support is starting to be thought of as an additional business opportunity.'
 - a. Increased technical support is a means of making software more attractive to businesses.
 - b. Software manufacturers are using the fact their products are complex to start selling technical support to their customers.
5. Purchasers' needs seem always to exceed the capability of the available software by a constant time-frame of about six to twelve months.'
 - a. It takes about six to twelve months for purchasers to understand fully the software they buy.
 - b. The software customers want now what will only become available in about six to twelve months.

WRITING

I. Describe how you use computers in your study and in your free time.

II. You have been asked to write a list of guidelines for making your office more ergonomic. Look at the definition of ergonomics and then write an email to your manager explaining your guidelines. Consider 1-8 below.

Ergonomics - the study of how people interact safely and efficiently with machines and their work conditions.

1. Physical layout of the work site: desk areas, computer equipment, filing cabinets, etc.
2. Lighting (overhead lights, desk lamps), glare and ventilation
3. Computer and office furniture: ergonomic chairs and desks
4. User-friendly and ergonomic devices: keyboards, mice, monitors, wrist rests, copyholders, etc.
5. Location and features of telephones
6. Layout of cables and switches for a wired network
7. Wireless internet access and wireless network
8. Maintenance and technical repairs

III. This description of the Mac OS X is drawn from the table below. Write a similar description of Linux.

Mac OS X is a Unix-based operating system designed for use on Apple Mac computers. It includes memory-protection, preemptive multitasking and symmetric multiprocessing support. Graphics are provided by a graphics engine known as Quartz. It has advanced-PDF standards support, OpenGL and Quicktime integrated into the OS. The operating system features are accessed through a graphical user interface called Aqua.

	Mac OS X	Linux
type	Unix-based	Unix-based
computer	Apple Mac	wide variety
features	memory-protection, pre-emptive multitasking, symmetric multiprocessing support	variety of distribution kits available
graphics engine	Quartz	XFree86
standard support	advanced-PDF, OpenGL, Quicktime	
user interface type	GUI	command line, GUI
user interface	Aqua	KDE, Gnome
source code availability	not available	freely available

IV. Summarize the text in 90-100 words. Follow these steps:

1. Read the text again.
2. Underline the relevant information in each paragraph.
3. Make notes about the main points. Leave out details such as examples.
4. Make sentences from the notes and link the sentences with connectors (*and, but, because, therefore*, etc.).
5. Write your first draft.

6. Improve your first draft by reducing sentences. For example:

- a. Cut out unnecessary phrases

Macs were designed with one clear aim: to facilitate interaction with the computer.

- b. Omit qualifying words (adjectives or modifying adverbs) *very complex*

- c. Transform relative clauses into *-ing* participle clauses

*Double-clicking a folder opens a window which contains programs, documents or... Double-clicking a folder opens a window **containing** programs, documents or...*

7. Write the final version of your summary. Don't forget to check the spelling and grammar.

GUI operating systems

The term **user interface** refers to the standard procedures that the user follows to interact with a computer. In the late 1970s and early 80s, the way users accessed computer systems was very complex. They had to memorize and type a lot of commands just to see the contents of a disk, to copy files or to respond to a single prompt. In fact, it was only experts who used computers, so there was no need for a user-friendly interface.

In 1984, Apple produced the Macintosh, the first computer with a mouse and a **graphical user interface (GUI)**. Macs were designed with one clear aim: to facilitate interaction with the computer. A few years later, Microsoft launched Windows, another operating system based on graphics and intuitive tools. Nowadays, computers are used by all kinds of people, and as a result there is a growing emphasis on accessibility and user-friendly systems.

A **GUI** makes use of a **WIMP** environment: windows, icons, menus and pointer. The background of the screen is called the **desktop**, which contains pictures called **icons**. These icons represent **files** or **folders**. Double-clicking a folder opens a window which contains **programs**, **documents**, or more nested folders. When you are in a folder, you can launch a program or document by double-clicking the icon, or you can drag it to another location. When you run a program, your PC opens a window that lets you work with different tools. All the programs have a high level of consistency, with similar toolbars, menu bars, buttons and dialog boxes. A modern OS also provides access to networks and allows multitasking, which means you can run several programs - and do various tasks - at the same time. The most popular operating systems are:

- The **Windows** family - designed by Microsoft and used on most PCs. The most recent version is Windows Vista.
- **Mac OS** - created by Apple and used on Macintosh computers.
- **Unix**- a multi-user system, found on mainframes and workstations in corporate installations.
- **Linux** - open-source software developed under the GNU General Public License. This means anybody can copy its source code, change it and distribute it. It is used in computers, appliances and small devices.
- **Windows Mobile** - used on most PDAs and smart phones (PDAs incorporating mobile phones).
- **Palm OS** - used on Palm handheld devices.
- **RIM** - used on BlackBerry communication devices. Developed by Research In Motion.
- The **Symbian OS** - used by some phone makers, including Nokia and Siemens.

These computer platforms differ in areas such as device installation, network connectivity or compatibility with application software.

V. Make notes about the different stages in your computer history. Add more stages if you want to.

Example: 1990: *Played my first computer game. It was...*

Possible stages:

- First computer game
- First computer lesson at school/college
- First programming language learnt
- First software used
- First computer course/qualification
- First job involving computers
- First stepson the Internet
- First chat online

VI. Make a story "Life Without Computers".

Murphy's computers laws

1. Any given program, when running, is obsolete.
 2. If a program is useful, it will have to be changed.
 3. If a program is useless, it will have to be documented.
 4. Any given program will expand to fill all the available memory.
 5. The value of a program is inversely proportional to the weight of its output.
 6. Program complexity grows until it exceeds the capability of the programmer who must maintain it.
 7. Every non trivial program has at least one bug.
- Corollary 1 - A sufficient condition for program triviality is that it has no bugs.
- Corollary 2 - At least one bug will be observed after the author leaves the organization.
8. Bugs will appear in one part of a working program when another 'unrelated' part is modified.
 9. The subtlest bugs cause the greatest damage and problems.
 10. A 'debugged' program that crashes will wipe out source files on storage devices when there is the least available back-up.
 11. A hardware failure will cause system software to crash, and the customer engineer will blame the programmer.
 12. A system software crash will cause hardware to act strangely and the programmers will blame the customer engineer.
 13. Undetectable errors are infinite in variety, in contrast to detectable errors, which by definition are limited.
 14. Adding manpower to a late software project makes it later.
 15. Software does not fail when the technician is in the room.
 16. The probability of a hardware failure disappearing is inversely proportional to the distance between the computer and the customer engineer.
 17. A working program is one that has only unobserved bugs.

18. No matter how many resources you have, it is never enough.

19. Any cool program always requires more memory than you have.

When you finally buy enough memory, you will not have enough disk space.

Disks are always full. It is futile to try to get more disk space. Data expands to fill any void.

If a program actually fits in memory and has enough disk space, it is guaranteed to crash.

If such a program has not crashed yet, it is waiting for a critical moment before it crashes.

20. No matter how good of a deal you get on computer components, the price will always drop immediately after the purchase.

21. All components become obsolete.

The speed with which components become obsolete is directly proportional to the price of the component.

22. Software bugs are impossible to detect by anybody except the end user.

23. The maintenance engineer will never have seen a model quite like yours before.

24. It is axiomatic that any spares required will have just been discontinued and will be no longer in stock.

25. Any VDU, from the cheapest to the most expensive, will protect a twenty cent fuse by blowing first.

25. If a circuit requires n components, then there will be only $n - 1$ components in locally-held stocks.

26. A failure in a device will never appear until it has passed final inspection.

27. A program generator creates programs that are more buggy than the program generator.

28. All Constants are Variables.

29. A part dropped from the workbench will roll to a degree of un-reachability proportional to its importance.

30. The best way to see your boss is to access the Internet.

No matter how hard you work, the boss will only appear when you access the Internet.

The boss will always come to your workspace when you accidentally open an adult link.

31. The hard drive on your computer will only crash when it contains vital information that has not been backed up.

32. Computers don't make errors-What they do they do on purpose.

33. Each computer code has five bugs, and this number does not depend on how many bugs have been already found.

34. The number of bugs always exceeds the number of lines found in a program.

35. The most ominous words for those using computers: "Daddy, what does 'Now formatting Drive C mean'?"

36. Every non-trivial program contains at least one bug.

Every non-trivial program can be simplified by at least one line of code.

Conclusion: Every non trivial program can be simplified to one line of code, and it will contain a bug.

37. An expert is someone brought in at the last minute to share the blame.

38. Debugging is at least twice as hard as writing the program in the first place.

39. So if your code is as clever as you can possibly make it, then by definition you're not smart enough to debug it.

40. For any given software, the moment you manage to master it, a new version appears.

41. The new version always manages to change the one feature you need most.

42. Whenever you need a crucial file from the server, the network will be down.

Whenever you need a crucial file from your hard drive, your computer will crash.

43. E-mailed tasking will always come just before you log off.

44. A quarantined virus - will be opened. A chain letter - will be sent. To global. A dozen times.

45. The chance of a virus infecting your network is directly proportional to the amount of damage it does.

46. The faster you need a hardcopy, the more people will be using the only office printer.

47. A patch is a piece of software which replaces old bugs with new bugs.

48. The probability of forgetting your password is directly proportional to the frequency of changing it.

49. The longer it takes to download a program the more likely it won't run.

50. A program is good when it's bug free - which is impossible.

51. If you forget to save your work every 5 minutes, it will break down after you've been at it for an hour.

52. It's not a bug, it's an undocumented feature.

53. The only thing worse than an end-user without a clue is an end-user who has a clue - usually the wrong one.

54. According to most Tech Support people, the most common user error message (regardless of Operating System) is ID 10T.

55. Most application failures occur between the hours of 2 and 4 am on a Sunday night - with a 6 am Monday deadline for the project.

56. Bugs mysteriously appear when you say, "Watch this!" If you call another programmer over to see if he knows what's wrong the bug disappears.

57. The probability of bugs appearing is directly proportional to the number and importance of people watching.

58. The only program that runs perfectly every time, is a virus.

59. If a project is completed on schedule, it wasn't debugged properly.

60. Real programmers don't comment their code. If it was hard to write, it should be hard to understand.
61. Format C: fixes all
62. A computer that has been on the market for 6 weeks is still usable as a boat anchor.
63. A computer that has surpassed its user's frustration capacity will accelerate downwards at 9.8 meters per second squared.
64. Computers let you waste time efficiently.
65. Make a system even a moron can use and a moron will use it.
66. The likelihood of problems occurring is inversely proportional to the amount of time remaining before the deadline.
67. 90% of a programmer errors come from data from other programmers.
68. If you make the letters in your Word document bigger and then you print it out, you'll have everything on the first page and only one line on the second.
69. By the time you learn your new computer you'll need a new one.
70. After a software is released, the first bug found will be by a person who normally does not use that portion of the program but was wondering why he can't do something he normally would not do.
71. When the Downloading Window says "99% complete", there will be a fluctuation in the voltage and you'll have to start all over again.
72. Millions of people believe they are animals, but I have yet to meet one that believes in Windows' stability. Even human stupidity has limits ;-)
73. The troubleshooting guide contains the answer to every problem except yours.
74. Whenever you install a group of plugins one by one just to find out which one can make your software work, you either

haven't gotten the right one, or have accidentally skipped the right one or it has become the last one installed.

75. No matter what problem you have with your computer – It's Always Microsoft's fault.

Corollary: If it's not their fault - Blame them anyway.

76. You'll always receive an e-mail from a web site that you never visit before.

77. If you need to shutdown your PC ASAP, it will restart.

The quickest way to shutdown a PC is to unplug it.

78. No matter how big a hard drive you buy, you'll need to double it in a year.

79. Complete computer breakdown will happen shortly after the maintenance person has left.

80. The problem always exists between one keyboard and it's respective chair.

81. The smaller the size of your email account, the more junk mail you will get.

82. Antivirus systems only effectively work on a virus after given virus has passed its prime.

83. When designing a program to handle all possible dumb errors, nature creates a dumber user.

84. Computers never work the way they are supposed to. Especially when nothing is wrong with them.

85. A program will work as you think it should only when you don't care if it does.

86. The longer the e-mail, the greater the chance it will not make it to its destination, for whatever reason.

87. Computers are unreliable, but humans are even more unreliable. Any system which depends on human reliability is unreliable.

88. If Murphy's laws are so true then how come I can log onto this site and submi..... [connection reset - error message 928]

TRANSLATION

I. Translate from Russian into English:

1. Электронная почта представляет собой эффективный способ быстрого обмена текстовыми сообщениями и хранения их в электронном формате.
2. Компьютерные преступления включают в себя широкий спектр незаконных действий, которые могут привести к потере права пользователя на личную жизнь.
3. Стремительное развитие технологии является причиной быстрого устаревания электронных устройств, избавление от которых вызывает проблему утилизации электронных отходов.
4. Беспроводные сети предоставляют возможности поиска в сети Интернет, а также скачивания и просмотра музыки и видео в цифровом формате в любой точке планеты.
5. Несмотря на свои преимущества, широкое использование компьютерных устройств во всех сферах жизни может вызвать компьютерную зависимость.
6. Многие печатные средства массовой информации предпочитают иметь электронные версии своих изданий, публикуемые в сети Интернет.
7. Для обработки фотографий на компьютере потребуется установка необходимого программного обеспечения.
8. Возможности технологии виртуальной реальности позволяют совершать действия, невозможные в реальном мире.
9. Составление графиков и таблиц является неотъемлемой частью работы служащих в сфере экономики.
10. Вспомогательные технологии значительно облегчают использование компьютера инвалидами.

Vocabulary

Assistive technology - вспомогательная технология

Computer addiction - компьютерная зависимость

Cybercrime - киберпреступность, киберкриминал, преступления в интернете, сетевая преступность

Design an on-line newspaper – делать дизайн электронной газеты

Download files - загружать файлы

DVD (Digital Video Disc) recorder - дисковое записывающее устройство

Electronic waste - электронные отходы

GPS (Global Positioning System) - глобальная система навигации и определения положения

HMD (head-mounted display) – нашлемный дисплей

Interactive whiteboard - интерактивная доска

Loss of privacy – потеря *права* на частную жизнь

Make calculations - делать вычисления

Publish e-books - публиковать электронные книги

Retouch photos - ретушировать фотографии

Screen reader - экранный диктор, программное обеспечение, предназначенное для интерпретации происходящего на экране в голосовые сообщения, либо в шрифт Брайля

Send e-mails - отправлять электронную почту

Store information - хранить информацию

Surf the Web - бродить по Интернету

Technological dependence - технологическая зависимость

Virtual reality - виртуальная реальность

Wireless network – беспроводная *сеть*

Write letters and faxes - писать письма и факсы

II. Translate from Russian into English:

1. Ноутбук - это переносной персональный компьютер, который весит несколько килограммов. Время работы ноутбуков от аккумулятора находится в пределах от 1 часа до 4

часов. Портативные компьютеры выполняют те же задачи, что и настольные компьютеры, хотя производительность ноутбука существенно ниже. Портативные компьютеры имеют жидкокристаллический дисплей. В дополнение к встроенной клавиатуре, они могут содержать сенсорную панель или иное устройство для ввода, хотя к нему может подключаться внешний компьютерный манипулятор типа мыши или клавиатуры.

2. Планшетный компьютер - класс ноутбуков, оборудованных сенсорным экраном, которые позволяют работать при помощи стилуса или пальцев, как с использованием, так и без использования клавиатуры и мыши. Планшетный ПК удобен для чтения электронных книг и редактирования документов.

3. Карманный персональный компьютер - портативное вычислительное устройство, обладающее широкими функциональными возможностями. Изначально КПК предназначались для использования в качестве электронных органайзеров. В настоящее время КПК используются для доступа к офисным приложениям, чтения книг, проигрывания аудио и видео, выхода в Интернет.

4. Надеваемый компьютер можно носить на теле. Предоставляет возможность работать, общаться, развлекаться при помощи компьютера постоянно и иметь при этом полную свободу передвижения.

5. Мейнфрейм - высокопроизводительный компьютер со значительным объёмом оперативной и внешней памяти, предназначенный для организации централизованных хранилищ данных большой ёмкости и выполнения интенсивных вычислительных работ.

6. Настольный компьютер - стационарный персональный компьютер, предназначенный для работы в офисе или в домашних условиях. Термин обычно используется для того, чтобы обозначить вид компьютера и отличить его от

компьютеров других типов, например, портативного компьютера, карманного компьютера, встроенного компьютера или сервера.

Vocabulary

A mainframe - высокопроизводительный компьютер со значительным объемом оперативной и внешней памяти, предназначенный для выполнения интенсивных вычислительных работ

A desktop PC - настольный компьютер

A laptop - портативный компьютер

TFT (thin film transistor – тонкопленочный транзистор)

screen - экран тонкопленочной технологии

A touchpad - сенсорная панель

USB (Universal Serial Bus) - интерфейс передачи данных периферийных устройств) port - USB-порт

A battery pack - батарея

A tablet PC - планшетный компьютер

A handheld device - портативное устройство

PDA (Personal Digital Assistant) - персональный цифровой секретарь, карманный компьютер

A stylus - стилус, компьютерное перо

A touch screen - сенсорный экран

Handwriting recognition - распознавание почерка

Voice recognition - распознавание голоса

A wearable computer - носимый компьютер

III. Translate from Russian into English:

1. Основными задачами компьютера являются ввод и вывод информации, а также обработка и хранение данных.
2. Главные составляющие компьютера включают в себя аппаратное и программное обеспечение.

3. Программное обеспечение представляет собой совокупность инструкций, данных, программ, которые обрабатываются компьютером.
4. Помимо механических и электронных частей в состав аппаратного обеспечения компьютера входят периферийные устройства.
5. В ПЗУ хранится критически важная для компьютера информация, которая не зависит от выбора операционной системы.
6. Для ввода и вывода данных к компьютеру подключаются внешние устройства, которые позволяют вводить информацию, подлежащую обработке (клавиатура, мышь), и выводить результаты этой обработки (монитор, принтер).
7. Среди устройств для хранения информации, жесткий диск является ключевым компонентом системы ПК, так как он предназначен для долговременного хранения большинства программ и документов.
8. Преимущество DVD над CD заключается в предоставлении более широких возможностей для управления записанной информацией, а также больший объем ее хранения.
9. Процессор получает данные для обработки из оперативной памяти - устройства, предназначенного для временного хранения как входных, так и выходных данных.
10. Порты ввода – вывода являются универсальными, позволяющими подключать неограниченное количество разнообразных внешних устройств, включая внешние накопители на жестких дисках, CD и DVD приводы, проигрыватели, флэш-карты.

Vocabulary

CPU (Central Processing Unit) - центральный процессор (ЦПУ)

Hard disk drive - жесткий диск

Hardware - аппаратное обеспечение

Input devices - устройства ввода данных

Keyboard - клавиатура

Main memory – основная память, оперативная память

Mouse – компьютерная мышь

Output devices - устройства выхода данных

Peripherals - периферийные устройства

RAM (Random Access Memory) – оперативное запоминающее устройство (ОЗУ), память со случайным доступом

ROM (Read-Only Memory) – постоянное запоминающее устройство (ПЗУ)

Software - программное обеспечение

Storage device - запоминающее устройство

USB (Universal Serial Bus) – интерфейс передачи данных (периферийных устройств) port - USB-порт, интерфейс, обеспечивающий подключение к компьютеру цифровых и мобильных устройств.

IV. Translate from Russian into English:

1. У любой операционной системы три основные функции: управлять компьютерными ресурсами, устанавливать пользовательский интерфейс; выполнять и обеспечивать сервисы для программ.
2. Операционные системы обеспечивают сервисы для программ и дают возможность выполнения множества задач.
3. Полоса с заданиями в зависимости от программы, с которой вы работаете в данный момент.
4. Указатель или курсор представляет собой стрелку, которой управляет мышь или определённые клавиши на клавиатуре, и это позволяет делать выбор в меню.
5. Вспомогательные компьютерные программы, утилиты, необходимы для восстановления повреждённых дисков, файлов, способствуют более успешному пользованию компьютерами людьми-инвалидами и оказывают и другие услуги.

6. Операционная система Windows создана компанией Майкрософт и используется в большинстве персональных компьютеров.
7. Графический пользовательский интерфейс впервые был введён в пользование операционной системой Apple Macintosh.
8. Операционная система Юникс используется в компьютерах различных размеров, но в основном многопользовательских с множеством заданий.
9. Хотя операции по вводу-выводу применяются программами приложения, они выполняются операционной системой.

Vocabulary

Handle - уметь обращаться, работать с чем либо

multitasking - многозначность

WIMP – Windows, Icons, Menus and Pointer - окна, иконки, меню, мышь

drop-down menu - открывающееся окно

pull-down menu - спускающееся окно

crashed disc rescuer - спасатель испорченных дисков

task bar - полоса с заданиями

V. Translate from Russian into English:

1. Администратор базы данных – специалист, отвечающий за выработку требований к базе данных, её проектирование, реализацию, эффективное использование и сопровождение, и защиту от несанкционированного доступа.
2. Системный администратор – сотрудник, в обязанности которого входит не только слежение за сетевой безопасностью организации, но и создание оптимальной работоспособности компьютеров и программного обеспечения для пользователей.

3. Технический писатель – специалист, занимающийся документированием в рамках разработки программного обеспечения.
4. Специалист службы поддержки – сотрудник структуры, разрешающей проблемы пользователей с компьютерами, аппаратным и программным обеспечением. Сотрудник технической поддержки регистрирует все обращения конечных пользователей.
5. Оператор ПК занимается набором текстов, занесением информации в базу данных, созданием и форматированием электронных версий документов, составлением таблиц и сводок, проведением элементарных расчетов. Работа ведется на персональных компьютерах и требует от специалиста внимательности, высокой скорости печати, знания стандартного пакета офисных программ, умения пользоваться локальной сетью и находить нужную информацию в Интернете.
6. Веб-дизайнер – это специалист в области веб-разработки и дизайна, в задачи которого входит проектирование пользовательских интерфейсов для сайтов или приложений.
7. Инженерия программного обеспечения – это область компьютерной науки, которая занимается построением программных систем, настолько больших или сложных, что для этого требуется участие команды разработчиков, порой даже нескольких команд. Программный инженер должен быть хорошим программистом, уверенно разбираться в структурах данных и алгоритмах и свободно владеть одним или более языком программирования.
8. Системный аналитик – сотрудник, ответственный за анализ интересов заинтересованных лиц создаваемой ИТ-системы на предмет возможности их удовлетворения её техническими свойствами. Основным продуктом системного аналитика являются организационно-технические ре-

шения, оформляемые как техническое задание на систему, техническое задание на программное обеспечение.

Vocabulary

A project manager – руководитель проекта

A database analyst – аналитик базы данных

A network analyst – сетевой аналитик

A system analyst – системный аналитик

A Web designer – дизайнер веб приложений

A software engineer – программный инженер

A hardware engineer – специалист по оборудованию

A security specialist – специалист по компьютерной безопасности

A network/computer system administrator – сетевой/системный администратор

A database administrator – администратор базы данных

A computer operator – оператор ПК

A help desk technician – специалист службы поддержки

A computer training instructor – специалист по компьютерному обучению

A technical writer – технический писатель

A desktop publisher – разработчик графики приложений

A computer animator – специалист по компьютерной анимации

VI. Translate from Russian into English:

1. При фишинге мошенники используют незнание пользователями правил пользования сетями.
2. Многие пользователи хотя бы один раз подвергались виртуальному преследованию в сети.
3. Установка межсетевого экрана позволит уменьшить количество вредоносного программного обеспечения.

4. Шпионское программное обеспечение – один из самых распространенных способов собрать конфиденциальную информацию о пользователе.
5. Одним из способов обезопасить личные данные является использование цифрового сертификата.
6. В 2013 году произошло резкое увеличение числа троянских программ, занимающихся кражей данных, которые пользователь вводит в веб-форму.
7. Фишинг основан исключительно на методах социальной инженерии, и как только в дело вступают вредоносные программы, атака уже не может более считаться фишингом.
8. Вирусы распространяются, копируя свое тело и обеспечивая его последующее исполнение: внедряя себя в исполняемый код других программ, заменяя собой другие программы, прописываясь в автозапуск и другое.
9. Вирусом или его носителем может быть не только программы, содержащие машинный код, но и любая информация, содержащая автоматически исполняемые команды — например, пакетные файлы и документы Microsoft Word и Excel, содержащие макросы.

Vocabulary

cracker – интернет-взломщик

scam – мошенничество

phishing – фишинг

cyberstalking – киберпреследование, виртуальное преследование

piracy – пиратство

malware – вредоносное программное обеспечение

virus – вирус

worm – червь

Trojan horse – троянская программа

spyware – шпионское программное обеспечение

ЗАКОНЫ МЕРФИ

1. Любая действующая программа устарела.
2. Любая программа обходится дороже и требует больших затрат времени, чем предполагалось.
3. Если программа полностью отлажена, ее нужно будет скорректировать.
4. Любая программа стремится занять всю доступную память.
5. Сложность программы растет до тех пор, пока не превысит способности программиста.
6. Самая грубая ошибка будет выявлена лишь, когда программа пробудет в производстве, по крайней мере, полгода.
7. Контрольные перфокарты, которые не могут стоять в неправильном порядке, будут перепутаны.
8. Непечатный жаргон - это тот язык, которым решительно все программисты владеют в совершенстве.
9. Компьютеры ненадежны, но люди еще ненадежнее. Любая система, зависящая от человеческой надежности, ненадежна.
10. Число ошибок, которые нельзя обнаружить, бесконечно, в противовес числу ошибок, которые можно обнаружить, - оно конечно по определению.
11. Увеличение числа участников при подготовке опаздывающей программы только замедляет процесс.
12. Работающая над программой группа питает отвращение к еженедельной отчетности о достигнутых результатах, поскольку она слишком явно свидетельствует об отсутствии таковых.
13. Создайте систему, которой сможет пользоваться дурак, и только дурак захочет ею пользоваться.
14. Любая, даже самая гениальная программа никогда не работает в момент сдачи ее заказчику.

15. Новый компьютер сломается как раз тогда, когда старый отключат и выбросят.
16. Программы тестирования обязательно находят ошибку там, где их нет.
17. Чтобы ошибиться, достаточно компьютера, но чтобы действительно испортить все, нужен все-таки еще и человек.
18. Если бы строители строили здания так же, как программисты пишут программы, первый залетевший дятел разрушил бы цивилизацию.
19. Компьютеры - вещь слишком сложная, чтобы работать в принципе. Поэтому то, что они работают хоть как-то, уже чудо.
20. Если вам кажется, что ситуация улучшается, значит вы чего-то не заметили.

TEXTS FOR TRANSLATION

A tiny computer attracts a million tinkerers

Raspberry Pi is actually one of the hottest and cheapest little computers in the world right now. Almost 1 million of these \$35 machines have shipped since last February, capturing the imaginations of educators, hobbyists and tinkerers around the world.

The story of the Raspberry Pi begins in 2006 when Eben Upton and other faculty members at the University of Cambridge in Britain found that their incoming computer science students were ill-prepared for a high-tech education. While many students in the previous decade were experienced electronics hobbyists by the time they got to college, these freshmen were little more than skilled Web designers.

Easy-to-use, modern PCs hide most of the nuts and bolts behind a pleasing interface. Upton posited that parents did not want their children to destroy their expensive computers by ex-

perimenting with their insides. But a cheaper machine would be fair game for messing around.

The Raspberry Pi - about 3 inches by 2 inches and less than an inch high - was intended to replace the expensive computers in school science labs. For less than the price of a new keyboard, a teacher could plug in the Pi and connect it to older peripherals that might be lying around. But because Pi initially ran only Linux, a free operating system popular with programmers and hobbyists, students would have a learning curve.

The Raspberry Pi Foundation began selling the computers in February of last year. They soon could not keep them in stock. "We honestly were thinking of this as a 1,000- to 5,000-unit opportunity," Upton said. "The thing we didn't anticipate was this whole other market of technically competent adults who wanted to use it. We're selling to hobbyists."

Picking up a Raspberry Pi is not as easy as popping into a store. The Pi is so popular that many distributors are constantly out of stock. It is also difficult to find them online.

"The old phrase 'selling like hot cakes' needs to be updated to 'selling like Raspberry Pi's,'" said Limor Fried, founder and engineer at Adafruit Industries, a distributor of the Pi. "We've sold tens of thousands in weeks."

The Pi costs \$35, or \$25 for an older model, and comes as a bare circuit board. The Raspberry Pi works best with an HDMI-compatible monitor and USB keyboard and mouse. It is powered via a standard USB cable - just like the one that charges your phone - and it includes an audio-out port for connecting a set of speakers, plus an RCA jack if you don't have a digital TV or monitor available. There is no on-off switch. To turn it off, you simply pull out the power cable.

The Raspberry Pi will not do much out of the box. Because it has no onboard storage or operating system, you will need to copy the necessary software to a high-capacity SD memory

card. A four-gigabyte card usually works well, but you may want more if you plan to load applications or games.

There are a number of available operating systems for the Raspberry Pi. On the official website, raspberrypi.org, you'll find something under downloads called Raspbian, a Raspberry-flavored version of the Debian operating system that includes tools for beginners. Raspbian uses an interface that will be familiar to users of Windows or Linux. Adafruit has its own version of the Pi operating system called the Raspberry Pi Education Linux Distro at learn.adafruit.com. It comes with a child-friendly browser.

Also available are programs that you can use to add additional features to the Raspberry Pi, including Wi-Fi support (an add-on peripheral is required) and hardware controllers for connecting your Pi to sensors, motors and more.

Truly adventurous Raspberry Pi fans can even turn the product into a small home media center. Because the Pi has a powerful graphics chip on board, users have been able to stream video and photos to their big-screen TVs using little more than a Pi and a Linux program like RaspbMC at www.raspbmc.com. This fully featured media center lets you stream video from a hard drive on the network and supports AirPlay, Apple's proprietary video and audio streaming system.

Upton said the plan was to develop the Pi's software rather than the hardware. "If you improve the software, everyone can use it," he said. "If you change the hardware, you leave a million buyers behind."

Upton said he was "blown away" by the reception the Pi had gotten online.

"I'm not aware of a company that has gone from a standing start to a million in a year," he said. "It's quite a wild ride. I don't get a lot of sleep at the moment."

When asked if he planned to give a Pi to his children, Upton said he and his wife, Liz, who works with him on the project, had not had time to start a family.

"We're busy, so we're glad we haven't had kids yet," he said. "It's Pi and then kids, not kids and then Pi."

Google: From "Don't Be Evil" to Evil Empire?

Finally, journalists have started criticizing in earnest the leviathans of Silicon Valley, notably Google, now the world's third-largest company in market value. The new round of discussion began even before the revelations that the tech giants were routinely sharing our data with the National Security Agency, or maybe merging with it.

What do the US government and Silicon Valley already have in common? Above all, they want to remain opaque while making the rest of us entirely transparent through the capture of our data. What is arising is simply a new form of government, involving vast entities with the reach and power of government and little accountability to anyone.

Google, the company with the motto "Don't be evil," is rapidly becoming an empire. Not an empire of territory, as was Rome or the Soviet Union, but an empire controlling our access to data and our data itself. Antitrust lawsuits proliferating around the company demonstrate its quest for monopoly control over information in the information age. Its search engine has become indispensable for most of us, and as Google critic and media professor Siva Vaidhyanathan puts it in his 2012 book *The Googlization of Everything*, "We now allow Google to determine what is important, relevant, and true on the Web and in the world. We trust and believe that Google acts in our best interest. But we have surrendered control over the values, methods, and processes that make sense of our information ecosystem." And that's just the search engine.

About three-quarters of a billion people use Gmail, which conveniently gives Google access to the content of their communications (scanned in such a way that they can target ads at you). Google tried and failed to claim proprietary control of digital versions of every book ever published; librarians and publishers fought back on that one. As the New York Times reported last fall, Paul Aiken, executive director of the Authors Guild, summed the situation up this way: "Google continues to profit from its use of millions of copyright-protected books without regard to authors' rights, and our class-action lawsuit on behalf of US authors continues."

In Europe, there's an antitrust lawsuit over Google's Android phone apps. In many ways, you can map Google's rise by the litter of antitrust lawsuits it crushed en route. By the way, Google bought Motorola. You know it owns YouTube, right? That makes Google possessor of the second and third most visited websites on earth. (Facebook is first, and two more of the top six are also in Silicon Valley.)

A New York venture capitalist wrote that Google is trying to take over the entire Internet and asked the question of the day: "Who will stop Google?"

Invasion of the Low-Cost Tablets

Two weeks ago, I received a press release from a company called D2 announcing its new 16-gigabyte 7-inch tablet running Android Jelly Bean 4.1 and priced at \$89. This is sold exclusively at Big Lots and went on sale March 1. This new tablet also has a micro SD slot so you can upgrade its memory, making it a very versatile, yet low-cost tablet solution.

That same day I got a note from HP stating that it introduced a new 7-inch tablet of its own, known as the Slate7, also using Android Jelly Bean 4.1 for \$169. Unlike the D2, the Slate7 has a 3-megapixel rear-facing camera and a VGA camera on the front. It goes on sale in April.

Of course, Google has its own low-cost tablet called the Nexus 7. And Amazon's 7-inch Kindle Fire HD sells for \$199. And over at Fry's, our local tech supermart, I recently saw at least three non-branded tablets selling for \$99 or less.

With all of this low-cost tablet activity going on, it seems pretty clear that the invasion of the low-cost tablet is in full swing. They're very affordable for anyone who wants or needs a tablet.

Although this race to the bottom in low-cost tablets will not deliver any major profits for those making these cheap tablets, this is really good news for consumers. It also suggests that we are about to launch the "tablet-in-every-room" phase of the tablet market — one that could have the profound effect of speeding up the integration of all things digital into our lifestyles.

By nature of the amount of tablets I have for various reasons, I already have a tablet in every room of my house. Some are iPads and some are Android tablets of various operating system versions. And one or two of them are based on Microsoft's Windows 8 operating system. All have at least two common denominators among them: The first is a web browser. This means that every tablet I have gives me unlimited access to the Internet via the web browser. The second common denominator between all of them is identical apps. Well over 100,000 apps are the same on Android and iOS, making it possible to have, for example, my Evernote files on all of my tablets, or the Kindle e-book reader or news readers like Flipboard and Pulse. And many of these apps are or will be on Windows 8 tablets in the near future.

While each operating system has its distinct advantages and the iOS ecosystem is the richest of the three, all of these tablets work as tablets, meaning that they are small, lightweight and very portable. This makes them ideal for music, watching movies or TV shows and reading books and magazines on whatever tablet is the closest to us at the time we need one.

In our research, we are already seeing a high number of homes that have two tablets and even some with three tablets that are both personal and communal in their use. With tablets priced in the \$89-\$99 range now becoming commonplace, it won't be long before we could see multiple tablets in most homes, thus driving the role of tablets deeper into our digital lifestyles.

With this type of tablet pricing, it is easy to see how low-cost 7-inch tablets could dominate the tablet market by the end of this year. In fact, we are predicting that these smaller and cheaper tablets will represent 65% of all tablets sold in the U.S. by the end of 2013. While I see Apple's iPad Mini as a major player in this smaller tablet arena, it's Android that is the operating system of choice in the really low end of the tablet space. I have no doubt that this operating system will probably dominate the low end of the tablet market.

If these smaller and cheaper tablets represent the major market for tablets, this puts Microsoft in a rather sticky position. To date, the company has put most of its R&D and marketing efforts into larger tablets. However, we hear that an updated version of Windows 8 called Windows Blue has been created for use on screens from 7 inches to 10.1 inches. We hear Windows Blue should be out in time for back-to-school season, and if prices are reasonable, Microsoft could have a fighting chance to also be a player in the smaller-sized tablet market that's already dominated by Apple and Google.

The low-cost tablet invasion is in full swing and it will only help drive more and more people to tablets as their primary mobile computing devices. These cheaper and smaller tablets could soon become integrated into the tech fabric of our lives and hopefully drive new apps, services and ways people use them to enhance their lives.

Wanted: global rules on cyberwarfare

A stunning report by a US digital-security company accuses China's military of conducting more than 100 cyberattacks on American corporate and government computers. If accurate, the report by the firm Mandiant only adds to the urgency to develop international norms in cyberwar and cyberespionage.

Each new tool of aggression requires its own rules of war. Cyberwarfare should be no different. Without a code of ethics for conflict in the digital universe, nations could eventually bring down each other's water supplies, electric grids, military defenses, and vital institutions. And key values, such as privacy and a right to intellectual property, could also be lost.

Global rules now restrict the use of nuclear, chemical, and biological weapons. They also help safeguard civilians and prisoners of war. What the Mandiant report shows is that the world may be losing the struggle to come up with rules for cyberspace behavior.

One of the unusual aspects of cyberweapons is that once they are used, they can be easily replicated for a return attack.

Coming up with such rules will not be easy. For starters, simply defining what is a cyberweapon or a cyberattack could be a problem. Even if that issue is settled, how can an attack's originator be correctly identified? And given the speed of digital technology, the distinction between defensive and offensive capabilities can be easily blurred.

Current rules of war under the Geneva Conventions and the International Committee of the Red Cross may cover some aspects of cyberwar, but not all. The United Nations and other global bodies need to make such rules clear.

Even within the United States, Congress and President Obama cannot agree on rules for national defense against cyberattacks. An attempt to pass a law last year that would have required companies to cooperate with the government in cybersecurity ran into concerns over civil liberties.

As a result, Mr. Obama issued an executive order last week offering incentives for companies to improve data sharing with the government. The aim is to protect vital infrastructure now run by private firms.

Like the current US policy on clandestine drone strikes against terrorists, Obama is moving toward a legal presumption of executive authority in being able to launch cyberattacks without approval by Congress or legal oversight by a court. If he does assume such powers, it raises a difficult constitutional issue that needs public debate.

Nations have a strong record of creating norms that restrain types of warfare. Before more reports of cyberattacks emerge, the world must see a common interest in rules to prevent cyberwar.

Disruptions: Digital Era Redefining Etiquette

Some people are so rude. Really, who sends an e-mail or text message that just says “Thank you”? Who leaves a voice mail message when you don’t answer, rather than texting you? Who asks for a fact easily found on Google?

Don’t these people realize that they’re wasting your time?

Of course, some people might think me the rude one for not appreciating life’s little courtesies. But many social norms just don’t make sense to people drowning in digital communication. Then there is voice mail, another impolite way of trying to connect with someone. Think of how long it takes to access your voice mail and listen to one of those long-winded messages. “Hi, this is so-and-so....” In text messages, you don’t have to declare who you are, or even say hello. E-mail, too, leaves something to be desired, with subject lines and “hi” and “bye,” because the communication could happen faster by text. And then there are the worst offenders of all: those who leave a voice mail message and then e-mail to tell you they left a voice mail message.

This is by no means the first conundrum with a new communication technology. In the late 1870s, when the telephone was invented, people didn't know how to greet a caller. Often, there was just silence. Alexander Graham Bell, the inventor, suggested that people say "Ahoy!" Others proposed, "What is wanted?" Eventually "Hello" won out, and it hastened its use in face-to-face communications.

Now, with Google and online maps at our fingertips, what was once normal can be seen as uncivilized — like asking someone for directions to a house, restaurant or office, when they can easily be found on Google Maps.

I once asked a friend something easily discovered on the Internet, and he responded with a link to imgtfy.com, which stands for Let Me Google That For You.

In the age of the smartphone, there is no reason to ask once-acceptable questions: the weather forecast, a business phone number, a store's hours. But some people still do. And when you answer them, they respond with a thank-you e-mail.

How to handle these differing standards? Easy: think of your audience. Some people, especially older ones, appreciate a thank-you message. Others, like me, want no reply. "It is important to think about who the relationship is with," Mr. Senning said.

The anthropologist Margaret Mead once said that in traditional societies, the young learn from the old. But in modern societies, the old can also learn from the young. Here's hoping that politeness never goes out of fashion, but that time-wasting forms of communication do.

SUPPLEMENTARY READING

The Top 10 Emerging Technologies For 2014

The World Economic Forum, famous for its annual Davos convention in Switzerland, has put out a new report identifying the top technological trends for the coming year.

"Technology has become perhaps the greatest agent of change in the modern world," writes WEF's Nour Afeyan. "While never without risk, positive technological breakthroughs promise innovative solutions to the most pressing global challenges of our time, from resource scarcity to global environmental change."

"By highlighting the most important technological breakthroughs, the Council aims to raise awareness of their potential and contribute to closing gaps in investment, regulation and public understanding," he writes.

From wearable electronics to brain-computer interfaces, here are the big technologies to look out for this year.

1. Body-adapted Wearable Electronics

"These virtually invisible devices include earbuds that monitor heart rate, sensors worn under clothes to track posture, a temporary tattoo that tracks health vitals and haptic shoe soles that communicate GPS directions through vibration alerts felt by the feet.

"The applications are many and varied: haptic shoes are currently proposed for helping blind people navigate, while Google Glass has already been worn by oncologists to assist in surgery via medical records and other visual information accessed by voice commands."

2. Nanostructured Carbon Composites

"Emissions from the world's rapidly-growing fleet of vehicles are an environmental concern, and raising the operating efficiency of transport is a promising way to reduce its overall impact.

"New techniques to nanostructure carbon fibers for novel composites are showing the potential in vehicle manufacture to reduce the weight of cars by 10% or more. Lighter cars need less fuel to operate, increasing the efficiency of moving people and goods and reducing greenhouse gas emissions."

3. Mining Metals from Desalination Brine

As freshwater continues to dwindle, desalinating seawater has emerged as an option. "Desalination has serious drawbacks, however. In addition to high energy use, the process produces a reject-concentrated brine, which can have a serious impact on marine life when returned to the sea.

"Perhaps the most promising approach to solving this problem is to see the brine from desalination not as waste, but as a resource to be harvested for valuable materials. These include lithium, magnesium and uranium, as well as the more common sodium, calcium and potassium elements."

4. Grid-scale Electricity Storage

"There are signs that a range of new technologies is getting closer to cracking [challenges]. Some, such as flow batteries may, in the future, be able to store liquid chemical energy in large quantities analogous to the storage of coal and gas.

"Various solid battery options are also competing to store electricity in sufficiently energy-dense and cheaply available materials. Newly invented graphene supercapacitors offer the possibility of extremely rapid charging and discharging over many tens of thousands of cycles. Other options use kinetic potential energy such as large flywheels or the underground storage of compressed air."

5. Nanowire Lithium-ion Batteries

"Able to fully charge more quickly, and produce 30%-40% more electricity than today's lithium-ion batteries, this next generation of batteries could help transform the electric car market and allow the storage of solar electricity at the house-

hold scale. Initially, silicon-anode batteries are expected to begin to ship in smartphones within the next two years."

6. Screenless Display

"This field saw rapid progress in 2013 and appears set for imminent breakthroughs of scalable deployment of screenless display. Various companies have made significant breakthroughs in the field, including virtual reality headsets, bionic contact lenses, the development of mobile phones for the elderly and partially blind people, and hologram-like videos without the need for moving parts or glasses."

7. Human Microbiome Therapeutics

"Attention is being focused on the gut microbiome and its role in diseases ranging from infections to obesity, diabetes and inflammatory bowel disease.

"It is increasingly understood that antibiotic treatments that destroy gut flora can result in complications such as *Clostridium difficile* infections, which can in rare cases lead to life-threatening complications. On the other hand, a new generation of therapeutics comprising a subset of microbes found in healthy gut are under clinical development with a view to improving medical treatments."

8. RNA-based Therapeutics

Developments in basic Ribonucleic acid (RNA) science, synthesis technology, and in vivo delivery i.e. in a living organism, "are combining to enable a new generation of RNA-based drugs that can attenuate the abundance of natural proteins, or allow for the in vivo production of optimized, therapeutic proteins. Working in collaboration with large pharmaceutical companies and academia, several private companies that aim to offer RNA-based treatments have been launched."

9. Quantified Self (Predictive Analytics)

"Smartphones contain a rich record of people's activities, including who they know (contact lists, social networking apps), who they talk to (call logs, text logs, e-mails), where they go

(GPS, Wi-Fi, and geo-tagged photos) and what they do (apps we use, accelerometer data).

"Using this data, and specialized machine-learning algorithms, detailed and predictive models about people and their behaviors can be built to help with urban planning, personalized medicine, sustainability and medical diagnosis."

10. Brain-computer Interfaces

"The ability to control a computer using only the power of the mind is closer than one might think. Brain-computer interfaces, where computers can read and interpret signals directly from the brain, have already achieved clinical success in allowing quadriplegics, those suffering 'locked-in syndrome' or people who have had a stroke to move their own wheelchairs or even drink coffee from a cup by controlling the action of a robotic arm with their brain waves. In addition, direct brain implants have helped restore partial vision to people who have lost their sight."

New York Times hacking revelations shed new light on China cybercrime

Chinese officials have denied the allegations, which prompted skepticism from Times executives who devoted weeks to tracking the move.

Revelations that China apparently targeted the New York Times in a campaign of cyber-espionage have cast a rare spotlight on attempts by Beijing to crack down on any criticism of its ruling elite.

The move, which was detected and then monitored by the Time's digital staff, is believed to have been linked to the newspaper's hard-hitting October exposé on the vast wealth accumulated by the family of leading communist and outgoing premier Wen Jiabao.

"This is business-as-usual from what we can tell for aspects of the Chinese government," said Marc Frons, head of the news-

paper's digital technology and its chief information officer. Frons told The Guardian that the paper was expecting further such attempts to infiltrate its computer systems. "It is really spy versus spy," he said. "I don't think we can relax. I am pretty sure that they will be back."

The hackers gained entry to the newspaper's internal systems and accessed the personal computers of 53 employees including David Barboza, its Shanghai bureau chief and author of the Wen exposé, and Jim Yardley, a former Beijing bureau chief.

An investigation by Mandiant, a cyber-security company hired by the New York Times, concluded that the hacks were likely part of an elaborate spy campaign with links to the country's military. The company traced the source of the attacks to university computers that the "Chinese military had used to attack United States Military contractors in the past", the Times said.

Although the hackers gained passwords for every Times employee, Mandiant found that they only sought information that was related to the Wen story. "They were after David Barboza's source list; confidential names and numbers and looking to find out who he was talking to," said Frons.

The Times said it worked with telecommunications company AT&T and the FBI to trace the hackers after AT&T noticed suspicious activity on the paper's computer networks on 25 October, one day after the article appeared in print. A later analysis concluded that hackers initially broke into Times computers on 13 September when reporting for the Wen story was in its final pre-publishing stages.

Instead of immediately going public, however, the Times took the decision to watch the hackers and see what they were after, though it took steps to isolate vital commercial information, such as reader email addresses and subscriber information, behind security walls. "We let them play in our environment so that we could watch what tools they were using and watch what they were doing," Frons said.

The Wall Street Journal said on Thursday that its computer systems had also been infiltrated by Chinese hackers trying to monitor the newspaper's coverage of China.

Despite the vociferous denials the exposure of the hacking is likely to be a source of public embarrassment to Beijing. Yet it is unlikely to blunt its extensive activities when it comes to conducting cyber warfare. Experts say the contours of a Chinese cyber attack have become familiar. They begin with slightly malfunctioning computer networks, usually at the headquarters of a military contractor, government office or multinational internet company. Sensitive files might go missing; servers may crash.

According to the UK-based cyber-security researcher Greg Walton, western experts know a fair amount about Chinese hackers' methods – their "tools, techniques and procedures," in information technology parlance. "But we know very little about the people behind these machines," he said. "If we want to tackle a problem of such complexity, and of such danger to civil society networks transnationally, were going to have to do a tremendous amount of research into the people behind these programs."

The hackers frequently use a technique called "spear phishing," in which they send a piece of malware to a target via email; the hapless user may then download malicious files by clicking on a seemingly innocuous attachment. Chinese hackers have used this technique to compromise the Gmail accounts of senior US, South Korean and Australian government officials, and have attempted to access the White House's Military Office, home to the US's nuclear launch codes.

In November, Bloomberg reported that a Silicon Valley-based software engineer was hacked shortly after filing a civil lawsuit against Chinese authorities. The firm spent months under digital siege – hackers shut down its web servers, gained access to

confidential files, and spied on an employee with her own webcam.

The intrusions drove the company to the brink of bankruptcy. "If they could just put the company out of business, the lawsuit goes away," the engineer told Bloomberg. "They didn't need guys with guns or someone to break my kneecaps."

Windows 8 Sales: Five Questions That Still Need Answers

Windows 8, Microsoft reported yesterday, has sold 40 million Windows 8 licenses in its first month of retail. That's an indisputably huge number, outpacing even Windows 7 sales at launch. But it's also a number that raises more questions than answers.

How many people are actually using Windows 8?

It's easy to forget that the vast majority of Windows 8 licenses Microsoft sells isn't direct to consumers. It's to Lenovo, HP, Dell, and all of its other hardware partners, who then go on to sell (or not sell) those devices to real human people. So how many copies of Windows 8 are on family room desks, and how many are collecting dust on a Best Buy back shelf?

How much of that is from Microsoft Stores?

There had already been a handful of Microsoft Stores scattered in the southwestern US, but the company made a huge self-branded retail push this fall to help boost its Windows 8 launch. So how many of those license sales are directly attributable to Microsoft's 65 North American shopping locales?

The success and failure of Microsoft Stores obviously can't be measured just in revenue; their main purpose is to familiarize people with a distinctly unfamiliar desktop platform, and to evangelize Microsoft's future-forward Surface hybrids. But remember that in 11 short years, Apple transformed a similar branding opportunity into the most lucrative retail operation in the world. Early strength from Microsoft Store sales could bode extremely well for Ballmer's merry band going forward.

How will it sell when the price goes up?

One of the driving factors behind that big number is price. It only costs \$40 to upgrade to Windows 8 Pro right now, and it'll stay that cheap through January. A comparable upgrade from Vista to Windows 7 cost more than twice that.

That cut-rate pricing is smart for Microsoft, both because Apple OS upgrades have gotten so cheap and because it helps ensure strong sales figures out of the gate. But what happens when the price goes back up?

What are people upgrading from?

Despite any and all reservations, the most remarkable thing about Windows 8 licenses jumping out ahead of Windows 7 licenses is that you had to upgrade to Windows 7. Its immediate predecessor, Vista, was just that bad. There's no such incentive with Windows 8. Windows 7 remains rock-solid, no one's still on Vista, and if you're on XP, well, you probably forgot that you even own a computer. Not only that, but Windows 8's design overhaul—as much as we appreciate it around these parts—can be actively intimidating.

So who's upgrading, who's converting, and what does that mean for Windows 8's long-term chances?

What kind of hardware is selling?

Microsoft also announced that 1,500 PCs and tablets have been certified for Windows 8, but didn't give any granular detail into which had actually been successful. Forty million licenses is a big number no matter how the pie is sliced, but it would be in Microsoft's long-term favor if touchscreen devices—the kind that Windows 8 was built for—were gaining traction. Unfortunately, according to recent comments by the CEO of Asustek to All Things D, that's not the case.

So yes, Windows 8 is off to a strong sales start. But until we find out some of the numbers behind the numbers, it's nearly impossible to tell what that means exactly for Microsoft, for you, and for the future of PCs.

Steve Jobs Was Wrong

Google's new Nexus 7 proves smaller tablets aren't completely worthless.

He'd come to rant. The CEO had prepared a nine-minute broadside against Android, Google's mobile operating system, and all of the Android tablets that were being rushed into production to take on the iPad. Many of those devices carried 7-inch screens, making them substantially smaller than the iPad, whose display is nearly 10 inches diagonally.

Jobs thought 7-inch tablets were too small. Apple's user testing had revealed that "there are clear limits of how close you can physically place elements on a touchscreen before users cannot reliably tap, flick, or pinch them," Jobs said. As a result, these tiny tablets would need to be sold with sandpaper, he predicted, "so that the user can sand down their fingers to around one-quarter of their present size." He wasn't finished: Because most tablet owners also have a smartphone, people would find that these tiny tablets didn't offer anything they couldn't do on their phones. "The 7-inch tablets are tweeners: too big to compete with a smartphone, and too small to compete with an iPad," Jobs said. As a result, they "are going to be DOA."

And for a long while, he was right. Manufacturers built 7-inch tablets because shrinking the display allowed them to cut costs enough to compete with the iPad on price. And, just as Jobs predicted, the small screen was a usability nightmare – you'd try to tap one thing and end up tapping another. This didn't have to be so. After all, you don't make all that many tap errors on even tinier smartphone screens. But because of cheap hardware and bad software, many 7-inch tablets – including the BlackBerry PlayBook and the Dell Streak 7 – totally sucked. Last year, Amazon attempted to change all that with its own 7-inch tablet, the Kindle Fire. That device was just as buggy as every other small tablet, but many people (myself included) argued that it made up for its problems with one overriding ad-

vantage: At \$199, it was super-cheap. I believed the Fire was 70 percent as good as an iPad. Since it was only 40 percent of the iPad's price, I thought it was a great deal.

Now Google has done Amazon one better. The search company worked with the hardware maker Asus to create a super-cheap 7-inch tablet that isn't buggy. In fact, the new tablet, called Nexus 7, is pretty fun. Over the last couple days, I've managed to use it for pretty much everything I do on my iPad: watching movies, reading books, browsing the Web, scanning email and Twitter, looking at photos, and playing games. For the most part, I found the experience quite pleasant.

Sure, it's not perfect. The Nexus 7 runs Google's latest version of Android, which I continue to find a bit cluttered and challenging for novices. It's also not nearly as fast as the iPad. It takes longer to load up Web pages, and you can't scroll or zoom as fluidly as on Apple's tablet. Its screen resolution, while perfectly satisfactory, isn't anywhere near as dreamy as Apple's Retina display. Plus, there aren't as many tablet-optimized apps available for the Nexus 7 as you'll find on the iPad.

But these are all quibbles. The Nexus 7 proves Steve Jobs was wrong. Google has built a 7-inch tablet that doesn't require you to sand down your finger: When you tap its screen, you'll hit exactly what you intended. Like the Kindle Fire, the Nexus 7 is \$199. But unlike Amazon's tablet, the Nexus 7 won't induce screen-tap rage. As a result, it's the best entry-level tablet on the market. It's not an iPad killer, but it's certainly a Fire killer – and if Google markets it well, it could sell a ton.

But there's one big problem with Google's small tablet: It lacks a business model. As Amazon did with its Fire, Google is selling the Nexus 7 at cost. Amazon could afford to do so because the Fire is a gateway to its online store. After you get the Fire, you'll buy a lot of books and movies from Amazon, and you

might even become a subscriber to Prime, Amazon's highly profitable subscription service.

But Google, unlike Amazon, doesn't sell physical stuff, so it can't justify the low price of the Nexus 7 on the expectation of huge e-commerce sales. Sure, the search company does sell media—you can buy books, music, and subscribe to magazines from the Nexus, but the selection is thin compared with what's available in Amazon or Apple's media stores. If you get a Nexus 7, you're better off relying on other sources for media. For books, install the Kindle app and buy from Amazon. For movies, use the Netflix app. For music, use Spotify.

Well, what about advertising? Google makes most of its money from ads, and boosting advertising revenue is the central goal behind Android. The more Android devices Google sells, the more people use its services, and thus, the more people see its ads. So if Google sells a lot of Nexus 7s, couldn't it make a lot more money from ads?

Not really. Google makes only about \$4 per year in ad revenue from every Android device, according to an analysis by Asymco's Horace Dediu. So if Google sells 10 million Nexus 7s – far more than anyone expects – it would make \$40 million a year from the device. For a company that made nearly \$12 billion in profits last year, that's nothing to crow about. (What's more, two-thirds of Google's mobile advertising revenue comes through Apple devices. If people choose the Nexus 7 over the iPad, Google might not be making any more money than it would have anyway.)

Google's real goal with the Nexus 7 can't be to make money. Instead, the tablet is a marketing device. Google wants to hop on the tablet train before it's too late. It's been two years since the iPad was released, and so far no one has managed to create a plausible alternative. The Nexus 7 is an effort to get people to believe that Android tablets aren't terrible. It's good enough to be usable for most people, and just cheap enough to get a lot of

folks to give it a try. And if you get the Nexus 7 and find that it isn't so bad, maybe one day you'll be willing to give other, not-so-cheap Android tablets a try.

It's a circuitous plan, and it could well fail. In the meantime, though, you might as well enjoy Google's pretty good, cheap tablet.

Happy birthday, Web! Public Internet turns 20

In 1989, Tim Berners-Lee developed a technology to help physicists in universities and institutes around the world share information. On April 30, 1993, the European science agency CERN – where Berners-Lee worked – officially made Berners-Lee's W3 software public domain, letting the public at large access it.

Yadda yadda yadda: Facebook, Instagram, Twitter and the rest. “There is no sector of society that has not been transformed by the invention, in a physics laboratory, of the web,” Rolf Heuer, CERN director general, said in a statement. “From research to business and education, the web has been reshaping the way we communicate, work innovate and live. The web is a powerful example of the way that basic research benefits humankind.”

To help celebrate what they label “the birth of the web,” CERN has launched a project to preserve and recreate the digital assets associated with the birth of the web.

“For a start we would like to restore the first URL – put back the files that were there at their earliest possible iterations. Then we will look at the first web servers at CERN and see what assets from them we can preserve and share,” the agency writes on a website associated with the project.

That website – the first in the world – was hosted on Berners-Lee's NeXT computer, a cutting edge computer from the company of the same name that was built by Steve Jobs after he left Apple. The website described the basic features of the web;

how to access other people's documents and how to set up your own server.

The NeXT machine – the original web server – is still at CERN, the agency said. But the world's first website was no longer online at its original address, the world's first URL: <http://info.cern.ch/hypertext/WWW/TheProject.html>

Up until this morning, it simply redirected the browser to CERN's front page. In honor of the 20th anniversary, that URL is back up and running, using the archived copy of the site that CERN has kept on its server the whole time.

For the record, Berners-Lee – who is often called The Godfather of the Internet – did not "invent" the Internet, and is quick to dispel any such rumors. In a post on his website, he explains the distinctions between the web protocol he developed and the larger Internet.

"I was lucky enough to invent the Web at the time when the Internet already existed – and had for a decade and a half. If you are looking for fathers of the Internet, try Vint Cerf and Bob Kahn who defined the "Internet Protocol" (IP) by which packets are sent on from one computer to another until they reach their destination."

China's Secret Cyberwar

On Wednesday, the security firm McAfee revealed that a widespread cyberattack had targeted 72 organizations including the United Nations, governments, defense contractors, and other corporations in what a McAfee executive called "the biggest transfer of wealth in terms of intellectual property in history." McAfee won't say who was behind the newly revealed attack, but as before, this one has Chinese fingerprints all over it. For example, the targets included the International Olympic Committee and several national Olympic committees, which were breached in the months before the 2008 Beijing Olympics.

“What’s going on is very large-scale Chinese industrial espionage,” says Richard Clarke, a former top U.S. government official who held roles in counterterrorism and cybersecurity and now is chairman of Good Harbor Consulting, a security and risk-management company in Arlington, Va. “They’re stealing our intellectual property. They’re getting our research and development for pennies on the dollar.”

Clarke says it’s time for the U.S. to start fighting back. He says President Obama should “authorize action to go after the computers involved in the attack.” Clarke says we could zap malware across the Internet, “the same way they do it. You can destroy the computers involved in the attack. They can pay a price.”

Clarke admits that doing this would risk escalating tension and might invite retaliation from the Chinese. “But it’s better than lying there prostrate having all your research and development and intellectual property stolen and doing nothing about it,” he says.

Phyllis Schneck, chief technology officer at McAfee, says that in 2009 the company discovered a “command and control” server that was being used to launch the attacks. McAfee collected logs of all the attacks that the server was carrying out, and warned organizations that were targeted. McAfee calls the attack campaign “Operation Shady RAT.” (RAT is an industry acronym for Remote Access Tool, meaning the software that gets installed in a corporate network and is used to extract information.)

Schneck says McAfee announced the attacks publicly because it wants people to realize that this kind of “quiet attack” has become so widespread that virtually every company of any size has been targeted already. “We like to say there are two kinds of companies—the ones who know they’ve been owned, and the ones who don’t know it yet,” Schneck says.

And for now, it seems, there’s not much we can do about it.

COMPUTER SCIENCE LANGUAGE

Adware A software application which displays unwanted pop-up advertisements on your computer while in use. Adware is often installed on your computer at the same time as free software or shareware.

Application An application is any program designed to perform a specific function directly for the user. Microsoft Word, Excel, Outlook or Adobe Photoshop are examples of application programs.

Bandwidth The range of frequencies, expressed in Kilobits per second, that can pass over a given data transmission channel within a frame relay network. The bandwidth determines the rate at which information can be sent through a channel – the greater the bandwidth, the more information that can be sent in a given amount of time. Usually measured in bits-per-second. A full page of English text is about 16,000 bits. A 56Kbs modem can easily move 16,000 bits in less than one second.

Beta Software Beta versions of commercial software are work-in-progress test copies released prior to the full version. They're used to put the product through real-world tests and to ferret out bugs before the finished software hits the shelves. Betas often expire after a period of time, usually when the full version or the next beta is released.

Bluetooth Chip technology enabling seamless voice and data connections between a wide range of devices through short-range digital two-way radio. It is an open specification for short-range communications of data and voice between both mobile and stationary devices. For instance, it specifies how mobile phones, WIDs, computers and PDAs interconnect with each other, with computers, and with office or home phones.

Bookmark 1) When you “bookmark” a page, you tell your Web browser to remember that page's address (URL), so that you can go back to it easily, without having to type in the URL

again. Bookmarks are called “favorites” in Microsoft Internet Explorer. It keeps your place, much like a bookmark in a book does. Most browsers have an easy method of saving the URL to create a bookmark. 2) Microsoft Web editors use the term bookmark to refer to a location within a hyperlink destination within a Web page, referred to elsewhere as an anchor.

Broadband A transmission facility having a bandwidth sufficient to carry multiple voice, video or data channels simultaneously. Each channel occupies (is modulated to) a different frequency bandwidth on the transmission medium and is demodulated to its original frequency at the receiving end. Channels are separated by guardbands (empty spaces) to ensure that each channel won’t interfere with its neighboring channels. This technique is used to provide 50 CATV channels on one coaxial cable.

Browser A program that allows a user to find, view, hear, and interact with material on the World Wide Web. Netscape Navigator and Microsoft Internet Explorer are examples of popular browsers.

Burn To write data or files onto a recordable CD using a hardware device called a CD Burner. Generally, you create either an audio or a data disc when you burn a CD. If you create an audio disc, you will be able to play that CD in any standard audio CD player. A data disc contains computer files and can only be read on computers. If you want to create an audio CD you must use software such as our RipEditBurn – simply copying wave (.wav) audio files onto a CD will produce a data CD, not an audio CD. On this site, “burn” refers to recording audio CDs that will be playable in your stereo.

Blog A blog is basically a journal that is available on the web. The activity of updating a blog is “blogging” and someone who keeps a blog is a “blogger.” Blogs are typically updated daily using software that allows people with little or no technical background to update and maintain the blog. Postings on a blog

are almost always arranged in chronological order with the most recent additions featured most prominently.

Bit Binary digit, the basic binary unit for storing data, either 0 or 1.

Buffer An area in memory used for temporary storage (eg: rapid input from keyboard)

Bug A defect or fault in a computer program that prevents it from working correctly. Bugs are caused by mistakes or errors made by the people who write the program.

Byte 8 bits – kilobyte (approx. 1,000 bytes), megabyte (1 million), gigabyte (1 billion)

Cache A sort of fast memory used for temporary storage of recently accessed web pages, which enables the browser to display them more quickly on the next visit.

Chipset The chipset controls the system and its capabilities. All components communicate with the processor through the chipset – it is the hub of all data transfer. The chipset uses the DMA controller and the bus controller to organize the steady flow of data that it controls. The chipset is a series of chips attached directly to the motherboard, and is usually second in size only to the processor. Chipsets are integrated (soldered onto the motherboard) and are not upgradeable without a new motherboard.

Codec Short for compressor/decompressor, a codec is any technology for compressing and decompressing data. Codecs can be implemented in software, hardware, or a combination of both. Some popular codecs for computer video include MPEG, Indeo and Cinepak. In telecommunications, (short for coder/decoder) a device that encodes or decodes a signal. For example, telephone companies use codecs to convert binary signals transmitted on their digital networks to analog signals converted on their analog networks. The translation of a binary value into a voltage that can be transmitted over a wire.

Configuration This is a general-purpose computer term that can refer to the way you have your computer set up. It is also used to describe the total combination of hardware components that make up a computer system and the software settings that allow various hardware components of a computer system to communicate with one another.

Cookie A piece of information sent by a Web server to a user's browser. (A Web server is the computer that "hosts" a Web site, and responds to requests from a user's browser.) Cookies may include information such as login or registration identification, user preferences, online "shopping cart" information, etc. The browser saves the information, and sends it back to the Web server whenever the browser returns to the Web site. The Web server may use the cookie to customize the display it sends to the user, or it may keep track of the different pages within the site that the user accesses. Browsers may be configured to alert the user when a cookie is being sent, or to refuse to accept cookies. Some sites, however, cannot be accessed unless the browser accepts cookies.

CPU Central Processing Unit. The main processing chip of a computer.

Crash A crash, in computing, is what happens when a program, or the entire operation system, unexpectedly stops working.

Cursor A blinking symbol on the screen that shows where any new text will next be entered.

DNS (Domain Name Server) – Used to map names to IP addresses and vice versa. Domain Name Servers maintain central lists of domain name/IP addresses and map the domain names in your Internet requests to other servers on the Internet until the specified web site is found.

Domain Name The unique name that identifies an Internet site. Domain Names always have 2 or more parts, separated by dots. The part on the left is the most specific, and the part on

the right is the most general. A given machine may have more than one Domain Name but a given Domain Name points to only one machine. For example, the domain names: matisse.net mail.matisse.net workshop.matisse.net can all refer to the same machine, but each domain name can refer to no more than one machine. Usually, all of the machines on a given Network will have the same thing as the right-hand portion of their Domain Names (matisse.net in the examples above). It is also possible for a Domain Name to exist but not be connected to an actual machine. This is often done so that a group or business can have an Internet e-mail address without having to establish a real Internet site. In these cases, some real Internet machine must handle the mail on behalf of the listed Domain Name.

Driver A piece of software that tells the computer how to operate an external device, such as a printer, hard disk, CD-ROM drive, or scanner. For instance, you can't print unless you have a printer driver. Hard disk drivers are invisible files that are loaded into memory when you start the computer, while scanner drivers are usually plug-ins accessed from within a particular application.

DSL A method for moving data over regular phone lines. A DSL circuit is much faster than a regular phone connection, and the wires coming into the subscriber's premises are the same (copper) wires used for regular phone service. A DSL circuit must be configured to connect two specific locations, similar to a leased line (however a DSL circuit is not a leased line. A common configuration of DSL allows downloads at speeds of up to 1.544 megabits (not megabytes) per second, and uploads at speeds of 128 kilobits per second. This arrangement is called ADSL: Asymmetric Digital Subscriber Line. Another common configuration is symmetrical: 384 Kilobits per second in both directions. In theory ADSL allows download speeds of up to 9 megabits per second and upload speeds of up to 640 kilobits per second. DSL is now a popular

alternative to Leased Lines and ISDN, being faster than ISDN and less costly than traditional Leased Lines.

DVD Digital video disk; a type of compact disc that holds far more information than the CD-ROMs that are used for storing music files. A DVD can hold a minimum of 4.7 GB, enough for a full-length movie. MPEG-2 is used to compress video data for storage on a DVD. DVD drives are backward-compatible and can play CD-ROMs.

Database A collection of information organized and presented to serve a specific purpose. (A telephone book is a common database.) A computerized database is an updated, organized file of machine readable information that is rapidly searched and retrieved by computer.

Email Electronic mail; system of sending messages through the internet; e-mail

FAQ Frequently asked questions

Firewall A firewall is a set of related programs, located at a network gateway server, that protects the resources of a private network from users from other networks. Basically, a firewall, working closely with a router program, filters all network packets to determine whether to forward them toward their destination. A firewall is often installed away from the rest of the network so that no incoming request can get directly at private network resources. There are a number of firewall screening methods. A simple one is to screen requests to make sure they come from acceptable (previously identified) domain names and IP addresses. For mobile users, firewalls allow remote access in to the private network by the use of secure logon procedures and authentication certificates.

Firewire A type of cabling technology for transferring data to and from digital devices at high speed. Some professional digital cameras and memory card readers connect to the computer over FireWire. FireWire card readers are typically faster than those that connect via USB. Also known as IEEE

1394, FireWire was invented by Apple Computer but is now commonly used with Windows-based PCs as well.

Flash Flash is an application published by the Macromedia company. Think of Flash as a ‘window’ that is displayed within the HTML environment. You have complete control of the window. You can display animations. You can make the animations clickable. You can make text move and change. Flash is very fast because it draws graphics on the fly, rather than storing text or graphics as complete images. (Although Flash can also display photographic images and illustrations). Flash gives you much more creative room than HTML, but it requires a ‘plug-in’, a piece of code on your computer that runs Flash. The newer browsers automatically come with Flash. If your user has an older browser, and they don’t already have Flash, they will be asked to download it. If they agree to download Flash, they will be sent to the Macromedia site where they will need to click on a few things to receive Flash. If they haven’t already downloaded Flash, you might lose them at this point. It is a tradeoff.

Flash Memory A special form of non-volatile EEPROM that can be erased at signal levels normally found inside the PC, so that you can reprogram the contents with whatever you like without pulling the chips out of your computer. Also, once a flash memory has been programmed, you can remove the expansion board it is mounted on and plug it into another computer if you wish.

Font A particular kind of lettering (for example : Arial, Bookman, Times New Roman).

Format Formatting a disk organizes the magnetic surfaces into tracks and sectors. In word processing, format refers to the physical appearance of a document, and includes such items as margins, line spacing, etc. In Excel, format refers to how numbers are shown (length, decimal points, etc.)

Freeware A form of software distribution where the author retains copyright of the software, but makes the program available to others at no cost. Freeware is often distributed on bulletin boards, or through user groups. The program may not be resold or distributed by others for profit.

Floppy disk Small, removable magnetic disc for (permanent) storing of data; diskette

Gateway The technical meaning is a hardware or software set-up that translates between two dissimilar protocols, for example America Online has a gateway that translates between its internal, proprietary e-mail format and Internet e-mail format. Another, sloppier meaning of gateway is to describe any mechanism for providing access to another system, e.g. AOL might be called a gateway to the Internet.

GUI Graphical User Interface. The most commonly used computer interface, exemplified by Microsoft Windows and MacOS. Typical elements of a GUI are a mouse interface and a system of visual directories that look like file folders.

Hacker A slang term for a computer enthusiast. Among professional programmers, the term hacker implies an amateur or a programmer who lacks formal training. Depending on how it used, the term can be either complimentary or derogatory, although it is developing an increasingly derogatory connotation. The pejorative sense of hacker is becoming more prominent largely because the popular press has co-opted the term to refer to individuals who gain unauthorised access to computer systems for the purpose of stealing and corrupting data. Hackers, themselves, maintain that the proper term for such individuals is cracker.

Handle A value that uniquely identifies something such as a file or data structure. Handles are meaningful only to the software that creates and uses them but are passed by other software to identify things. ODBC defines handles for environments, connections, statements, and descriptors. An un-

signed long (32-bit) integer assigned by Windows NT or Windows 95 to uniquely identify an instance (occurrence) of an object, such as a file or a window.

Hard disk Fixed, magnetic disc inside a PC for (permanent) storing of data.

Hard Drive A permanent data storage device built into all desktop PCs that permits you to save and retrieve information, and that stores the computer's operating system and other software. The size of a hard drive is usually expressed in gigabytes.

Hardware The physical equipment or touchable parts of a computer system, the CPU (central processing unit), the monitor, the keyboard, the mouse, the external speakers, the scanner, the printer, etc.

Home page The main page or opening page that appears when you visit a web site. It usually contains links to the other pages.

Host Any computer on a network that is a repository for services available to other computers on the network. It is quite common to have one host machine provide several services, such as SMTP (email) and HTTP (web).

HTML (HyperText Markup Language) — The coding language used to create Hypertext documents for use on the World Wide Web. HTML looks a lot like old-fashioned typesetting code, where you surround a block of text with codes that indicate how it should appear, additionally, in HTML you can specify that a block of text, or a word, is linked to another file on the Internet. HTML files are meant to be viewed using a World Wide Web Client Program, such as Netscape or Mosaic.

Hypertext Generally, any text that contains links to other documents. Words or phrases in the document that can be chosen by a reader and which cause another document (usually a Web page) to be retrieved and displayed. A link doesn't just

have to be text, however—pictures and icons can also be “clickable.”

Hardware The mechanical and electronic parts of a computer, not the software.

Icon On a system like Windows or Macintosh that uses a graphical user interface (GUI), a small picture or symbol that represents some object or function. Examples: a file folder for a directory; a rectangle with a bent corner for a file; or a miniature illustration for a program.

Intranet A private network inside a company or organization, which uses software like that used on the Internet, but is for internal use only, and is not accessible to the public. Companies use Intranets to manage projects, provide employee information, distribute data and information, etc.

Input Data entered into a computer (by keyboard etc).

Keyboard Alphanumeric keys or buttons used to input data (QWERTY = 1st 5 keys).

Mainframe A very large computer capable of supporting hundreds of users running a variety of different programs simultaneously. Often the distinction between small mainframes and minicomputers is vague and may depend on how the machine is marketed. Example of a mainframe: the OIT-administered IBM computer that supports TSO and WYLBUR.

Memory Part of a computer for (temporary) storing of data.

Mirror An FTP server that copies the same files from another server, and provides another site to download the files. The mirrored site is independent of the original. Some FTP servers get so many people downloading the same files that other servers have to be set up to mirror them and spread the load to more than one site. A mirror site is an exact replica of the original site, and is usually updated frequently to ensure that it reflects the same content as the original site. They are

used to make access to the files faster when the original site may be farther away, or running on a smaller server. Typically, the site that is the mirror will be in a better location to where more people can access the information quickly, and it will run faster as well, especially during high traffic times. Mirrored sites can give access to products such as pictures or simply have daily mail on them. They can be used for a wide variety.

Modem A device that modulates an analog carrier signal to encode digital information, and also demodulates such a carrier signal to decode the transmitted information. The goal is to produce a signal that can be transmitted easily and decoded to reproduce the original digital data.

Motherboard The main circuit board of a microcomputer. The motherboard contains the connectors for attaching additional boards. Typically, the motherboard contains the CPU, BIOS, memory, mass storage interfaces, serial and parallel ports, expansion slots, and all the controllers required to control standard peripheral devices, such as the display screen, keyboard, and disk drive. Collectively, all these chips that reside on the motherboard are known as the motherboard's chip-set. On most PCs, it is possible to add memory chips directly to the motherboard. You may also be able to upgrade to a faster CP by replacing the CPU chip. To add additional core features, you may need to replace the motherboard entirely.

MP3 A compressed audio format that is popular for downloading across the internet and for use with memory-based audio players. Files may be recorded on CD-R or CD-RW media for playback in compatible DVD players, audio CD players, and CD-ROM drives. Files are usually named as "mp3". Sound quality varies as a function of the recording/encoding bit rate. In our opinion, anything recorded with less than 128 kbps data rate will sound degraded. For a high fidelity home audio system, we would recommend MP3s encoded at no less than 256 kbps data rate. Anything less would

mean too much compression was used at the cost of sound fidelity.

Multimedia The delivery of information, usually to a personal computer, in a combination of different formats including text, graphics, animation, audio, and video.

Netiquette Network etiquette: a set of informal rules defining proper behavior on the Internet.

Operating system Software that communicates with hardware, enabling applications to run.

Output Data delivered by a computer (by printer, screen etc.).

Perl Practical Extraction and Reporting Language, a robust programming language frequently used for creating CGI programs on Web servers because it is faster than UNIX shell script programs, it can read and write binary files, and it can process very large files.

Plug-in A small piece of software that enriches a larger piece of software by adding features or functions. Plug-ins enable browsers to play audio and video. You can expand the capability of your browser by “plugging in” various tools to let you see and hear certain things, such as audio or video files. When your browser needs a plug-in you don’t have yet, it will tell you it’s encountered an “unknown file type.” SBC Yahoo! already provides the most popular plug-ins, including Shockwave (for audio and video), RealAudio (audio that broadcasts to your computer like a radio station), and MPEG play (more video). Plug-ins are very similar to another kind of Web tool called helper apps.

Portal Usually used as a marketing term to described a web site that is or is intended to be the first place people see when using the web. Typically, a portal site has a catalog of web sites, a search engine, or both. A portal site also may offer e-mail and other service to entice people to use that site as their main “point of entry” (hence “portal” to the web).

Peripheral Equipment linked to a computer [eg: printer, scanner, modem, mouse etc]

Program Software that contains coded instructions to control a computer. Programs are collectively referred to as "software".

Provider Company that provides access to the Internet.

Root (1) An administrative account with special privileges. For example, only the root account can load kernel extensions. (2) In graph theory, the base of a tree. (3) root directory: The base of a file system tree. (4) root file system: The primary file system off which a computer boots, so named because it includes the root node of the file system tree.

RAM Abbreviation for random access memory [it goes away when one switches off]

Scanner A piece of hardware, or peripheral device, used to scan a document and create a digital copy.

Screen Surface area of the visual display unit on which the image is formed.

Search Engine A tool that enables users to locate information on the World Wide Web. Search engines use keywords entered by users to find Web sites which contain the information sought. Some search engines are specifically designed to find Web sites intended for children.

Shareware Copyrighted software available for downloading on a free, limited trial basis; if you decide to use the software, you're expected to register and pay a small fee. By doing this, you become eligible for assistance and updates from the author. Contrast to public domain software which is not copyrighted or to freeware which is copyrighted but requires no usage fee.

Software Programs, routines etc. for a computer, not the hardware.

Spam Unwanted, irrelevant or inappropriate "junk" e-mail, especially commercial advertising sent to large numbers of people to promote products or services.

Spyware Software that collects information, without your knowledge, about your web-surfing habits and uses it for marketing purposes. Very often contained in free downloads or shareware programs.

Streaming A technology for transmitting electronic information in a stream, rather than in a complete package. This technology has enabled more accessible Internet audio and video. Audio, and especially video, files tend to be large, which makes downloading and accessing them as a complete package a very time-consuming operation. With streaming technology, however, the files can be downloaded and accessed at the same time, which makes using them much faster and easier. Streaming is the technology behind RealPlayer and TiVO.

Template Refers to a web page template that applies to all ClassWeb pages on our (or your) server. ClassWeb generates web pages for individual files that are based upon a common template, and thus are exactly alike in terms of layout, style, etc. The differences between ClassWeb sites are due to the course specific information that the page “calls” from our (or your) database.

Text Editor Any program which will do even the most basic word processing and will save files to standard ASCII text. Check your program’s manual if you are unsure of how this would be done, as different programs will do things differently.

Token Authentication token: a hardware device that generates a one-time password to authenticate its owner; also sometimes applied to software programs that generate one-time passwords. E-mail token: a data item in the header of an encrypted e-mail message that holds an encrypted copy of the secret key used to encrypt the message; usually encrypted with the recipient’s key so that only the recipient can decrypt it. In a network, a token is a special group of bits that travel around a token ring. If a computer wants to communicate on a network,

it gains permission by capturing the token. Only one token at a time may be active on a network, and the token may only travel in one direction around the ring.

Trinitron This is arguably the best consumer CRT (Cathode Ray Tube) in existence. The technology was developed by Sony Corporation, who owns complete rights to it. The Trinitron design has helped the company lead the market in the manufacturing of TVs and monitors for many years. The difference between a Trinitron tube and most other tubes is that the Trinitron uses an aperture grille instead of a shadow mask for creating the image on the screen. Considering you most likely know exactly what those are, not, I'll explain them. An aperture grille consists of wires stretched vertically down the screen (allowing for a vertically flat screen). A shadow mask is basically a metal plate with holes in it, where light can pass through. Because Trinitron monitors are vertically flat, they have less image distortion and less glare than most other monitors. If you look very closely at a Trinitron screen, you should see one or two very thin dark horizontal lines that span the width of the screen. These lines are small wires that support the aperture grille.

Trojan A Trojan is a computer program that is hidden in a useful software application and actually used to gain access to your computer. It then performs malicious actions such as displaying messages or erasing files. Trojans may be found in a hacked legitimate program or in free software.

Upload To send a file from one computer to another via modem, network, or serial cable. With a modem-based communications link, the process generally involves the requesting computer instructing the remote computer to prepare to receive the file on its disk and wait for the transmission to begin.

URL Uniform Resource Locator, the global address of documents and other resources on the World Wide Web. The first part of the address indicates what protocol to use, and the

second part specifies the IP address or the domain name where the resource is located.

Veronica (Very Easy Rodent Oriented Net-wide Index to Computerized Archives) – Developed at the University of Nevada, Veronica is a constantly updated database of the names of almost every menu item on thousands of gopher servers. The Veronica database can be searched from most major gopher menus. This is a search utility that helps find information on gopher servers. Veronica allows users to enter keywords to locate the gopher site holding the desired information. The name is an acronym for “Very easy rodent oriented net-wide index of computerized archives.”

Virus A program or piece of code that is loaded onto your computer without your knowledge and runs against your wishes. Most viruses can also replicate themselves and spread to other computers. All computer viruses are man made. Anti-virus programs periodically check your computer system for the best-known types of viruses.

Web Ring An arrangement for finding web sites in which a group of people whose web sites all had some interest in common would provide links to a central server. That server would keep track of the web sites in the ring, so that a user could click on a “Next” button on one web site, and be taken to the next web site in the web ring. The theory is that people who are interested in the topic of one web site might also be interested in another web site on the same topic.

Webmaster An individual who manages a Web site. Depending on the size of the site, the Webmaster might be responsible for any of the following: making sure that the Web server hardware and software is running properly, designing the Web site, creating and updating Web pages, replying to user feedback, monitoring traffic through the site.

Windows A family of operating systems for personal computers. Windows dominates the personal computer world, run-

ning, by some estimates, on 90% of all personal computers. Like the Macintosh operating environment, Windows provides a graphical user interface (GUI), virtual memory management, multitasking, and support for many peripheral devices. In addition to Windows 3.x and Windows 95, which run on Intel-based machines, Microsoft also sells Windows NT, a more advanced operating system that runs on a variety of hardware platforms.

Wizard An interactive utility that leads a user through all of the steps required to complete a complex task. Wizards produce a step by step guide for the user, with each possible alternative displayed. If a condition occurs which prevents a step from being completed, methods for resolving the problem are presented. When the problem is resolved, the user is returned to the next step in the process, until the task has been completed.

Worm A computer worm is a self-replicating computer program, similar to a computer virus. It infects additional computers (typically by making use of network connections), often clogging networks and information systems as it spreads.

WWW World Wide Web: A hypertext information system consisting of a network of web pages which runs on the Internet and can be accessed with a browser.

WYSIWYG Abbreviaton for What You See Is What You Get (data prints out exactly as on the screen).

Zip To zip a file is to compress it so that it occupies less space in storage and can be transferred quickly over the Internet.

Вебквест «Идеальный компьютер»

Цель вебквеста – рассмотреть процесс построения вычислительной системы с позиций аналитика, технического консультанта, консультанта по программному обеспечению, прайс-менеджера и юрисконсульта.

Задание

Вам необходимо выступить в одной из ролей:

Роль 1. Аналитик

Роль 2. Технический консультант

Роль 3. Консультант по программному обеспечению

Роль 4. Финансовый аналитик

Роль 5. Юрисконсульт.

Роль 1 Аналитик

Ваши задачи:

1. Подготовить обзор современного рынка вычислительной техники, уделив особое внимание различным его секторам:

- компьютеры серверного типа;
- мэйнфреймы;
- персональные компьютеры для профессиональной деятельности;
- персональные компьютеры для бытовой сферы;
- игровые персональные компьютеры;
- коммуникаторы;
- планшетные ПК;
- ноутбуки;
- нетбуки.

2. Дать анализ перспективам развития вычислительной техники в вышеперечисленных секторах рынка – определить лидеров индустрии, сравнить их доли на мировом рынке.

Отчет:

Отчет можно представить в виде презентации PowerPoint. Попробуйте дать ответ на следующие вопросы:

1. Какие Российские компании – производители ПК или комплектующих к ПК имеют перспективы выхода на международный рынок?
2. На какие зарубежные компании – лидеры в производстве ПК или комплектующих к ПК следует ориентироваться отечественному производителю?

Роль 2. Технический консультант

В обязанности технического консультанта входит создание конфигурации вычислительной системы. Технический консультант должен знать общий состав вычислительной системы, технические характеристики различных комплектующих к ПК, при необходимости, должен оказать консультативную помощь своей команде.

Вам нужно будет ответить на следующие вопросы:

1. Исходя из назначения вычислительной системы, какими критериями необходимо руководствоваться при выборе компьютера или комплектующих к ПК?
2. Какие характеристики являются наиболее важными для различных комплектующих к ПК?
3. Как часто нужно производить upgrade комплектующих к ПК?
4. Проведите анализ комплектующих различных производителей.

Отчет:

Отчет может быть представлен в виде презентации PowerPoint. В отчет следует включить схемы, фотографии и другие материалы. В устной форме необходимо дать свою оценку направлению – «моддингу». Актуален ли он в настоящее время?

Роль 3. Консультант по программному обеспечению

От того насколько грамотно, корректно установлено или настроено программное обеспечение, зависит качество и надежность работы компьютера. Ваша задача – подобрать программное обеспечение, наиболее полно удовлетворяющее потребности пользователя в конкретной сфере деятельности.

Вам нужно будет ответить на следующие вопросы:

1. Предложите наиболее оптимальную классификацию программного обеспечения ПК.
2. Что понимается под термином «открытый программный код» (OpenSource)? В чем его достоинства и недостатки?
3. Насколько небезопасно использовать программное обеспечение от непроверенных издателей?
4. В каких областях программных продуктов отечественные разработчики занимают лидирующие позиции на Российском рынке? Приведите примеры.
5. Проблема конфигурирования программного обеспечения в масштабах крупного предприятия.

Отчет:

Отчет можно представить в виде презентации PowerPoint. В работе необходимо дать сравнительный анализ программного обеспечения различных предметных областей – его надежность, функциональность дополнительные возможности, отличие от предыдущих версий.

Роль 4. Финансовый аналитик

Задача финансового аналитика – анализировать ценовой рынок комплектующих ПК, периферийных устройств и программного обеспечения, владеть информацией о кредитных программах фирм-продавцов, оказывать консультативную помощь по выбору фирмы-продавца.

Необходимо найти ответы на следующие вопросы:

1. Укажите объективные и субъективные факторы, влияющие на рост и падение цен на ПК или комплектующие к ПК, периферийные устройства и программное обеспечение.
2. Поясните экономический смысл соотношения «цена/качество»
3. Целесообразно ли проводить регулярный upgrade компьютера, либо более рационально полностью обновлять компьютер с определенной периодичностью?

Отчет:

Отчет можно представить в виде презентации PowerPoint. В отчет уместно включить графики и диаграммы, иллюстрирующие динамику цен на комплектующие и программное обеспечение ПК, кредитные предложения различных компаний-поставщиков. Предоставленные материалы должны сопровождаться устными пояснениями.

Роль 5. Юрисконсульт.

Задача юрисконсульта — обеспечение легальности всего программного обеспечения, соблюдения исполнения авторских прав.

Необходимо найти ответы на следующие вопросы:

1. Выскажите по проблеме лицензирования программного обеспечения в России.
2. Какие документы подтверждают легальность программного обеспечения?
3. Какие различия существуют между лицензированием коммерческого программного обеспечения в рамках крупного предприятия и свободного программного обеспечения (OpenSource)?

Отчет:

Отчет можно представить в виде презентации PowerPoint. В отчет необходимо включить ссылки на использованные

нормативно-правовые акты, международную судебную практику.

Ресурсы

Ресурсы, которые могут понадобиться для работы:

- Программа PowerPoint для подготовки слайд-шоу
- Ссылки на Интернет-ресурсы
- Периодические издания

Дополнительные ресурсы могут включать справочную литературу по вычислительной технике, фотографии, схемы, таблицы, слайды, видеоматериалы, иллюстрирующие и поясняющие работу различных устройств.

Источники информации в Интернете:

- www.skpress.ru - газета для корпоративных пользователей информационных технологий и решений PCWEEK
- www.technograd.com - Южнороссийский ресурс о Хайтек-технологиях, ПО, услугах связи, домашней, офисной, портативной техники и т.д.

Сайты производителей:

- www.ibm.com
- microsoft.com
- www.microstar.com
- genius.ru
- www.Intel.com
- oracle.com
- dell.com
- ru.asus.com
- acer.com

Appendix

reviews

Tomb Raider 4: The Last Revelation

Sega Dreamcast | Core Design/Eidos | ★★★

Although this is essentially the same game that recently appeared on the PlayStation, some fancy enhancements push this up to accelerated PC level. In fact, *The Last Revelation* is probably the best-looking version so far.

The Dreamcast remains unstretched but the visuals capture the Egyptian mood perfectly. The plot sees Lara returning to what she does best – raiding tombs in her usual physics-defying manner – but this time she stays in Egypt rather than globe-trotting.

So, what is *The Last Revelation*? The chances are only a few will ever find out

because this is a very tricky game. You will need to prepare for periods of intense frustration and annoyance, punctuated by some superb sequences.

If only Lara would move in the direction you point. If only she jumped when you press 'jump' rather than run those fatal final steps. If only the puzzles were less obscure.

So why bother? Well, the characterisation and the storyline are of sufficient quality to encourage perseverance. Also, solving a stubborn puzzle or back-flipping over a chasm is undeniably good fun. This is

the best version yet and will do for now, but a radical overhaul is needed before Lara returns again.

Greg Howson

Sim City 3000: World edition

PC | Maxis/Electronic Arts | ★★★★★

The basic game is the same as it was when it first appeared on the Commodore 64: zone land, build roads, set taxes and let simulated citizens build the city of your dreams or nightmares. A huge amount of detail has been added since then, and the World edition integrates hundreds of new buildings, a building editor, a terrain editor, and a scenario editor.

You no longer have to build American cities, and you can

quickly flip them into a European (German) or Asian (Korean/Japanese) style. You can add landmarks such as the Brandenburg Gate and the Eiffel Tower.

The amount of detail in the 3D buildings, cars and pedestrians is stunning. A new website is introduced also (www.simcity.com). There you can download even more buildings and swap files, buildings, city photos and scenarios with fellow fans.

If you gave up on SC2000, this will restore your faith; and if you haven't played Sim City before, this is a good place to start.

Jack Schofield

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4. World Link 2, Student Book / Susan Stempleski, Nancy Douglas, James R.Morgan. – Thomson & Heinle, 2011. – 154 p.
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6. Technical Information Network. March 98. Microsoft corporation, 1998.
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8. Glossary Page <http://www.basichardware.com/glossary.html>
9. Net Dictionary <http://www.netdictionary.com/>
10. Night Flight Computing Dictionary <http://nightflight.com/foldoc/>
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