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з англійської мови
до практичних занять та самостійної роботи студентів
напряму підготовки 0924 «Телекомунікації»

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Відповідальна за випуск зав. кафедри іноземних мов С.І. Кострицька, проф.

Друкується в редакційній обробці упорядників.

Unit 1

Task 1. Read the first and last paragraphs of the text. Then read the first sentence of each paragraph. What do you think this passage is going to be about?

Telecommunications is the technique of transmitting a message, from one point or place to another with the typical another additional attribute of being bi-directional. In practice it also recognizes that something may be lost in the process; hence the term 'telecommunication' covers all forms of distance communications, including radio, telegraphy, television, telephony, data communication and computer networking.

The elements of a telecommunication system are a transmitter, a medium (line) and possibly a channel imposed upon the medium, and a receiver. The transmitter is a device that transforms or encodes the message into a physical phenomenon; the signal. The transmission medium, by its physical nature, is likely to modify or degrade the signal on its path from the transmitter to the receiver. The receiver has a decoding mechanism capable of recovering the message within certain limits of signal degradation. In some cases, the final "receiver" is the human eye and/or ear (or in some extreme cases other sense organs) and the recovery of the message is done by the brain.

Telecommunication can be point-to-point, point-to-multipoint or broadcasting, which is a particular form of point-to-multipoint that goes only from the transmitter to the receivers.

The art of the telecommunications engineer is to analyze the physical properties of the line or transmission medium, and the statistical properties of the message in order to design the most effective encoding and decoding mechanisms.

When systems are designed to communicate through human sense organs (mainly vision and hearing), physiological and psychological characteristics of human perception will be taken into account. This has important economic implications and engineers will research what defects may be tolerated in the signal yet not affect the viewing or hearing experience too badly. Other Background Bell Labs scientist Claude E. Shannon published A Mathematical Theory of Communication in 1948. This landmark publication was to set the mathematical models used to describe communication systems called information theory. Information theory enables us to evaluate the capacity of a communication channel according to its bandwidth and signal-to-noise ratio.

At the time of publication, telecommunication systems were predominantly based on analog electronic circuit design. The introduction of mass-produced digital integrated circuits has enabled telecom engineers to take full advantage of information theory. From the demands of telecom circuitry, a whole specialist area of integrated circuit design has emerged called digital signal processing.

Possible imperfections in a communication channel are: shot noise, thermal noise, latency, non-linear channel transfer function, sudden signal drops, bandwidth limitations, signal reflections (echoes). More recent telecommunications systems take advantage of some of these imperfections to actually improve the quality of the

channel. Modern telecommunications systems make extensive use of time synchronization. There is a link between the development of telecommunications and very fine-grained (microsecond) time-keeping technology. Until the recent rise of the use of IP Telephony, most modern, wide-area telecommunications systems were synchronized to atomic clocks, or to secondary clocks synchronized to atomic time.

Task 2. Can you give any examples of telecommunications systems? (Check your answers on p.6).

Task 3. Scan the text and find the answers to the following questions.

1. What is telecommunications?
2. How is information transmitted?
3. What is the role of a telecommunications engineer?
4. Can any imperfections in a communication channel be beneficial for Telecommunications systems?

Task 4. Match the following words with their corresponding definitions.

1. Telecommunications	a) the science and technology of sending information by telephone, radio or television
2. Transmitter	b) to put secret information into a system of words, numbers or symbols that hides its real meaning
3. Medium	c) a television station and the programmes that it broadcasts
4. Channel	d) to succeed in understanding the meaning of a message written in code
5. Receiver	e) the part of a television or radio that receives electronic signals and changes them into pictures and sounds
6. Encode	f) a way of communicating information and idea
7. Decode	g) a fault or bad quality
8. Circuitry	h) a piece of electronic equipment used for sending radio, television or telephone signals through the air
9. Imperfection	i) something that is not obvious and has not developed yet
10. Latency	j) a system of circuits that an electric current flows around

Task 5. Complete the sentences with the words given in the box.

1. perception	2. communicate	3. digital	4. bandwidth
5. ratio	6.enable	7. evaluate	8. improve

a) …. signatures are used when you buy goods or make agreements on the Internet.
b) The public's …. of him is slowly changing.
c) This will …. users to conduct live video conversations.
d) They …. with each other via email.
e) The …. of expenditure to revenue was an alarming 4:1.
f) In academic writing, you need to …. data, ideas, situations and give your opinion of them.
g) Our main objective is to …. educational standards.
h) The amount of information that can be sent each second through an Internet connection is called …. .

Task 6. Complete the following sentences using the correct form of the word in capitals.

1. The Cup Final was …. via satellite to over 20 countries. TRANSMIT
2. Helen thought she could …. recall having seen him somewhere before. DISTANCE
3. If a television or radio programmer is …., it is broadcast by all the companies in a …. at the same time. NETWORKING
4. He won't …. anyone questioning his decisions. TOLERANCE
5. We can observe …. of English as the medium of international communication. EMERGE
6. A lot of objects are able to …. light. REFLECTION
7. Radio was the first …. for family entertainment before television. MEDIA
8. An editing unit is used to …. sound and images. SYNCHRONIZATION
9. …. circuit is a set of electronic parts on a single chip. INTEGRATE
10. …. television in the US is owned and operated by community organizations. PUBLICATION

Task 7. Read the text again and decide if the following sentences are true or false. If you think a statement is false, change it to make it true.

1. Encoding the contents of the message in such a way that hides its contest from outsiders is called decryption.
2. The encrypted message is called the ciphertext.
3. In cryptographic terminology, the message is called plaintext or cleartext.
4. The process of sending out electronic signals is called receiving.
5. The transmission medium can change the signal on its path from the transmitter to the receiver.
6. The receiver retrieves the plaintext from the ciphertext.

7. The task of a telecommunications engineer includes effective encrypting and decrypting mechanisms.
8. The modern telecommunications systems use analog electronic circuit design.

Task 8. Write the summary to the text paying attention to the following:

1. The forms of distance communications.
2. The functions of the telecommunications system elements.
3. Evaluation of a telecommunications system.
4. Possible imperfections in a communications channel.
5. Examples of telecommunications systems.

Task 9. Get into groups and discuss advantages of any example of telecommunications systems.

(Answers to Task 2: semaphore, telegraphy, radioteletype, the global telephone network (also known as the Public Switched Telephone Network or PSTN), radio, television, communications satellites, Ethernet, the Internet).

Unit 2

Task 1. Discuss the following questions.

1. How do people communicate with each other at distance?
2. What way(s) of communications do you prefer? Why?

Task 2. Scan the text. Look at the items below and complete them.

The old ways of Telecommunications systems:

1. _____
2. _____

The modern ways of Telecommunications Systems:

1. _____
2. _____

Direct Communication includes:

1. _____
2. _____
3. _____
4. _____

Indirect Communication includes:

1. _____
2. _____
3. _____

Which type of communications (direct or indirect) is more preferable among **uses System?** Prove your point of view.

Telecommunications systems and networks

Telecommunications systems offer various ways to communicate with voice audio. Telephones and radio are the traditional systems. We now have many other options in telecommunications, including cellular phones, conference calling, voice over IP, and call forwarding.

Telephones have been used to communicate for many years. There have been numerous advancements overtime. You have the option to add features such as caller ID, blocked phone numbers, call waiting, voice mail, phone security, 800 numbers, and call forwarding to any phone.

Cellular phones have become the most popular service of all Telecommunications systems. They allow you to talk on one phone from any location. There are many additional features that can be included with cell phone service, including caller ID, voice mail, internet service, digital camera function, and text messaging.

The Internet has prompted the creation of many new telecommunications systems. With a voice over IP Phone, you can hold conversations with others over the Internet, with telephone quality audio. You also have the option to fax documents, e-mail, instant message, and conference call over the Internet.

Telecommunications systems offer various options in communicating with others. They can be used in a business or social setting. You can also communicate quickly and effectively with people all over the world.

There are various methods of communication. The most common systems include telephones, cellular phones and the Internet. You can speak with people directly, leave voice messages, and send text messages, or leave e-mail messages to relay information.

Telecommunications systems can allow you to communicate directly or indirectly. Indirect options are common, but can take up more time. You can communicate indirectly with e-mail, faxes, voice mail, and text messages.

Direct communication is often preferred among users of telecommunications systems. They save time because you can establish direct contact with the recipient and receive an immediate response. Options in direct communication include talking on a telephone or cell phone, Internet chatting, conference calling, and instant messaging.

Task 3. Read the text again and give the main idea of each paragraph.

Task 4. These are the answers to the questions about the text. Write the questions**.**

1. There are many other options in telecommunications.
2. A lot of advancements have been done in telecommunications systems.
3. Cell phone service includes caller ID, voice mail, Internet service, digital camera function and text messaging.
4. You can hold conversations with people over the Internet.

5. The documents can be sent in different ways.
6. Information is relayed directly or indirectly.
7. There are advantages and disadvantages of direct or indirect communication.

Task 5. Find the words in the text to describe the following.

1. A device that takes and stores pictures in the form of electronic signals.
2. Relating to a mobile phone or its system of communication.
3. To stop something from moving through or along something else.
4. Safety from attack, harm or damage.
5. Something that you can choose in a particular situation.
6. An important part or aspect of something.
7. To do work or perform duties for a person or an organization.
8. A computer system that allows people in different parts of the world to exchange information.
9. To get something that someone gives or sends to you.
10. A friendly conversation.

Task 6. Match the words in the left and right columns. Make up your own sentences with the word combinations.

1) to communicate	a) message
2) to forward	b) service
3) to relay	c) at another address
4) instant	d) news or a message
5) the Internet	e) via email
6) establish	f) contacts
7) digital	g) money
8) save	h) television

Task 7. Give synonyms to the following words.

to communicate, to forward, to relay, instant, various, traditional, a response, a recipient, a cellular phone, an option, a conversation, to call.

Task 8. Write a short summary to the text.

Unit 3

Task 1. Read the first sentence of the text and discuss it with your groupmates.

Task 2. Look through the text quickly and decide what the text is about. Write down the main idea of it.

What does Telework bring to us? First it is ease of control and measurement. Results in electronic form can be easily archived, analysed by the computer, forwarded for checking and copied. All information about time and efforts spent is available. Another thing is that fixed time-based salaries are gone. The company will no longer care about who and how much spent on a rest. This will become a question of personal choice. Now everyone will be given a freedom to decide whether to work or to have a rest. This can differentiate workaholics from ordinary lazy people. Right now there are the same rules for everybody. Rarely a company wants to have a lot of part-time workers. We cannot imagine a worker coming to a factory when he is in the right mood. But with distant jobs you can have workers switching every now and then. We can even dream about perfect labour marketplace with contracts signed electronically for several hours. The psychological problems of switching jobs will be minimized. The retirement will no longer mean break of social relations, because they aren't based on physical presence in the company or at the factory.

This system of personal freedom has the potential to eradicate unemployment by allowing real-time communication and negotiation between employers and employees leading to equilibrium of labor price.

If you can measure the result of an office work, you can evaluate if it is worth paying the money for result you get or the jobs are completely useless and ineffective. This can lead to boost in productivity. In Telework people are usually paid for results not for time. This motivates them to get better results, thus increasing productivity again! On the other hand, regardless of employee's results, the company always gets what it pays for! Combined efforts of ten people can cost the same for the company if they have the same effect. The motivation is the problem of the person himself! And with a freedom of work choice motivation is not the problem. With Telework one can easily apply for the job he likes and the company can review all candidates just comparing the results of their work.

Thanks to the efforts of many people all over the world the Net commerce and work are still not limited as their off-line counterparts. Zero taxes attract more and more of the trade turnover. The Stock Exchange and Currency Exchange systems are already inculcated in the telecommunications world. With decreased transaction costs, development of telecommunications and computers the efficiency of these financial spheres is quickly increasing.

Distant work makes sexual and race discrimination very difficult and almost impossible. How can you behave badly toward your colleague if you only read his e-mails? How can the program written by Chinese be worse than the one written by French? It will also provide new unique opportunities for disable people. Nobody will know about their inabilities and nobody will keep them away from the job.

But the problem with results measuring still remains. How can we train managers and change their minds in order to deal with Telework? All internal relations will be built on a completely new basis. How can "white collars" remain superior over a worker if they are communicate over the computer network? How can superiority survive in the environment where both a worker and a manager

have the same access to information? This is impossible without personal pressure of managers. So, this will surely lead to a democratisation in the work.

Next problem is that Telework isn't as universal as we want. It isn't possible for any job, for example you won't agree with a distant driving of your taxi in rush hour. The control is necessary when human lives depend on the worker. Until we are not sure that communications will be 100% error free, we cannot avoid physical presence of a worker. The example is a distant control of an aircraft. Modern aircrafts can take off and land without anybody on board, but human pilots should be available for emergency cases. Several pilots in the airport could work for tens of aircrafts helping them to take off and land safely, then giving several hours of direct flight to a machine. But the storm can terminate the communications and lead to human deaths in a non-controllable plane. This shows us how careful we need to be with a new power that computers and communications give us.

In some areas we can't cope without live human beings, but the situation changes. Right now the technologies are available that can change the whole global economy. It means telesales. This includes all TV presentation, on-line stores and direct mailing. There was a bad idea of paying too much attention to a customer. In the shop there is always a sales manager available for questions but most time doing nothing. He cannot know everything about all the products he is supposed to sale. The situation is different in a modern on-line store. All the information about the product is available in a clear form. This can be a multimedia presentation, a chart, a table or just a plain text. If additional information is necessary, then the customer can initiate a chat session with a competent person, or ask for an e-mail response. Minimized costs. Maximized convenience.

Task 3. Decide whether the following statements are true or false.

1. Telework gives employees more free time.
2. Fixed – based salaries are still used in Telework.
3. Part – time workers are more useful in a company.
4. In a company with Telework employees must come in the right mood to a work.
5. There will to be retirements in Telework.
6. Telework leads to boosting productivity.
7. The employees are payed for results in Telework.
8. Telework can solve the problem of the person's motivation.
9. The stack Exchange and Currency Exchange systems increased their efficiency due to using Telework.
10. Telework can stop the monopolies of the market.
11. Telework can help to avoid sexual and race discrimination and a provide handicapped people with jobs.

Task 4. Read the text again and try to come up with your own definition of the word "Telework".

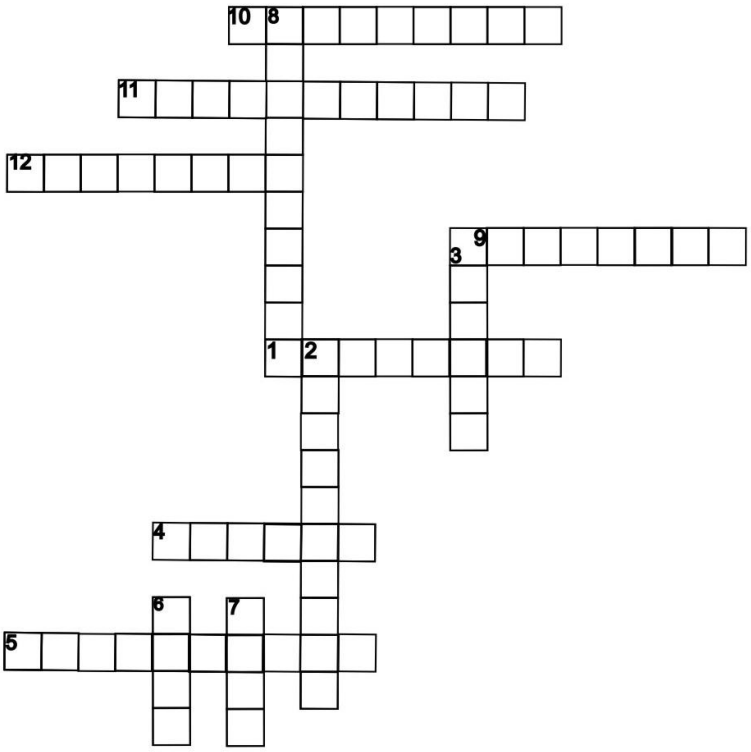
Task 5. Complete the crosswords.

Across.

1. An activity of someone who works at home on a computer and communicate with their office or customers by telephone, fax, or email.
4. A fixed of money that you earn each month or year from your job.
5. Someone who spends most of their time working and has little interest in other things.
9. To think carefully about something before making a judgment about its value.
10. To get rid of something completely, especially something bad.
11. Someone or something that has the same job or purpose as another person or thing, but in a different country, time situation, or organization.
12. The value of the goods and services that a company sells in a particular period of time.

Down.

2. Using electricity and extremely small electrical parts such as microchips and transistors. (adjective).
3. An attempt to do something that is difficult or involves hard work.
6. Not willing to work or do anything that involves effort.
7. The way someone is feeling, for example whether they are happy, sad, or angry.
8. The time when you stop working especially when you have reached the old age.



Task 6. Using the information from the sentences given below create your own definition of the following words:

a) virtual reality
b) cyberspace
c) disable handicapped.

1. Using computers to create graphics and sounds, virtual reality makes the viewer believe he or she is in another world.
2. Plug a terminal directly into the brain via a prepared skull and you can enter cyberspace.
3. There are many world substitutes for invalids, e.g. the handicapped, challenged by birth or by accident, disabled people.

Task 7. Read the text and fill in the gaps using the words from the list.

1. virtual
2. telecommunications
3. the standards
4. competition
5. interchangeable
6. increase
7. tendency

_____ will make a high-quality education accessible for everybody. The costs for giving a _____ lecture to one student and one thousand of

students are equal. This unimaginable scale of economy (and as a result – marginal costs of zero) will greatly _____ educational level. _____ will be almost the same in all countries thus making the workers worldwide more _____. This will back up the globalization _____. And strong rising _____ from newly educated people of third world will increase the desire to study among American and European students.

Task 8. Discuss the advantages and possible disadvantages of Telework in the different spheres of life.

Task 9. Do you agree with the following statements? Prove your points of view.

1. Next millennium will bring us to new horizons of social, political and economic interaction in the virtual world of modern telecommunications.
2. Internet offers us equality, freedom of speech and unique possibilities for self-realization.

Task 10. Choose a topic from above and write an essay.

Unit 4

Task 1. Match the following words with their definitions.

1. acquire	a. if an idea, attitude or plan shifts, or someone shifts it, it changes.
2. to shift	b. by a large amount or degree.
3. requirement	c. to get something by buying it or being given it.
4. visual	d. something that a rule, law, contract etc. states that you must do.
5. substantially	e. relating to things that you can see.
6. infancy	f. As much as is needed.
7. sufficient	g. the time when you are a baby or a very young child.

Task 2. Fill in the gaps in the following sentences choosing the right words from Task 1. Put them in the proper forms.

1. Public opinion had _____ sharply to the left following the war.
2. Television news brings us _____images from around the world.
3. The business was _____ from Orion four years ago.
4. Do these goods comply with our safety _____. ?

5. We have _____ increased the number of courses.
6. There is now _____ evidence to prove his claims.
7. Tourism on the island is still very much in its _____.

Task 3. Before reading the text "Progress in Telecommunications", discuss with your partner the following questions.

1. How does a person acquire the information necessary for his daily life?
2. What are the main functions of a telephone?
3. What are the differences between non-telephone services and a telephone?
4. How do you understand the following expressions "expanding freedom of choice", "information – based society."
5. What new means of communications do you know?

Task 4. Read the text and check your answers to Task 3.

Progress in Telecommunications

It is said that a man acquires 15 to 20 percent of the information necessary for his daily life through the auditory sense, while 60 to 80 percent is acquired through the visual sense. Just as radios in our living rooms and parlors gave way to television sets, there is a growing requirement to shift from auditory communications, centered on the telephone, to some form of visual communications that efficiently transmits and receives information.

A telephone is used substantially for direct person-to-person communications. Therefore, as mentioned earlier, the basic functions of a telephone are to provide real-time exchange of information and to provide speakers with the means of social interaction by chatting and so forth over the telephone. Information not provided by the telephone will shift gradually to non-telephone services, provided in a way that does not require participation of the person receiving the information. Non-telephone services like data and facsimile communications, for example, are machine-to-machine communications. If such communications equipment is provided with, for instance, automatic transmitting and receiving devices, it can be used at night or at times of light traffic. Therefore, it is possible for non-telephone services to expand as society becomes more and more information-oriented and as patterns of living are reorganized. For this reason, it is important that organizations providing telecommunications services meet these new non-telephone requirements in advance, and always be ready to cope with new requirements of their customers.

For this information-based society to achieve sound progress, two areas of freedom must be expanded. One is time. The information must be available at any time it is needed. The other is content. The information wanted must always be available.

In recent years, with people realizing the importance of different types of information, and with the diversification of needs and the desire that information must be geared more to the individual than to the masses, the need has arisen for more personalized information.

In addition, there is the need to expand the places where information is available. In addition to the work place, information is needed in the home, for housewives, children and the aged, and in local communities. Therefore, information must be in a form that permits free selection by each individual, rather than in a form that does not permit a choice. To afford itself such a selection, the public might decide on a system that provides with complete databases at an information center, from which the individual can select the information needed at the time it is needed.

A basic principle of communications is that the sender and receiver of information must be on an equal footing and that both have equal rights. This principle of equality is another reason that the person receiving the information must be given maximum freedom of selection. It is equally important for the receiver to exhibit the capabilities of analyzing the obtained information and forming judgements based on one's own intelligence.

Task 5. Unjumble the words given in brackets so that they match the definitions (sentences). You may use the text if you need prompting.

1. A room in a house where you entertain quests. (Plaror)
2. An exact copy of something, especially a book or document, formal a fax. (fcasiimle)
3. To deal successfully with a difficult situation or job. (Cpoe)
4. Able to be obtained, taken or used (aivalble).
5. The process of developing new products or business activities.
6. The ability to understand and think about things, and to gain and use knowledge. (inigllteecne)

Task 6. What part of speech are the following words? Form nouns which are related to the given words?

to transmit, to receive, to require, to acquire, to expand, to permit, to judge, to achieve.

Task 7. Complete the following table with the correct forms of the words.

Noun	**Verb**	**Adjective**	**Adverb**
	to audition		-
		visual	
substantiation			
	to avail		-
	to diversify		-

Task 8. Choose three more words from the text and complete as many boxes as possible in the last three rows.

Task 9. Make up sentences using the following word combinations.

Sufficient information, freedom of choice, information-based society, to permit selection, new media, to make substantial progress, obtained information, means of communications, to be under way.

Task 10. Read the following paragraph and tell what it says about.

INS must continue to absorb the new developments being made in telecommunications and must be used to function as an infrastructure for the advanced information society of the future. This does not mean that INS will create an advanced information society.

Task 11. Ask all possible questions to the following passage.

Advent of New Media

In view of these factors, new information media or other means of communications featuring new functions are required. Conventional telegraph, telephone, radio and television services are not sufficient. The rapid progress in electronics has caught the eye of many. Businessmen in particular have shown a keen interest in new media. For these reasons, intense studies are under way *to* develop these new means of communications.

Videotext, CATV, videoconference systems, multi-language broadcasting, and teletext are examples of new media coming into use. Development of these facilities has just begun, and is, therefore, still in its infancy.

To make substantial progress with these new forms of communication and make them readily available at low rates to anyone anywhere, it is essential that a network can efficiently and economically deal with the various media involved — voice, graphics, data and video. In other words, these media will bloom when all quarters come up with new ideas — ideas based on the principle of creating the INS proposed here.

Task 12. Prepare an oral presentation on the topic "Progress in Telecommunications".

Unit 5

Task 1. Before reading the articles discuss the following statements.

1. E-mail – love it, hate it, can't live without it.
2. All roads lead to Rome, all Internet users use e-mail.

Task 2. Read the articles and say if you agree or disagree with the authors. Give your reasons.

E-MAIL IN OUR LIFE TODAY

E-mail - love it, hate it, can't live without it.

It is not a secret that e-mail is something we can not live without today. Of course, every new tendency has an impact on our behavior, and e-mail's influence may be qualified as the biggest one. Is it more positive or negative? Let me start by analyzing its drawbacks.

The first negative fact that is often given to illustrate the disadvantages of e-mail is the loss of the ability to write- Yes, simply to hold a pen in a hand and write normally, and not just making incomprehensible lines and spots which are supposed to be letters. This point is followed by the fact that little by little we forget the handwriting of our friends, as well as the feeling that appears when we get an envelope with a postcard. A few words such as "I am having a great time on this island!" on the screen of the computer console our heart and soul.

Plus, e-mail brings us lots of useless information and our attempts to somehow regulate the avalanche of messages we do not need often lead to general dissatisfaction, maudlin sessions around the house and kicking of furniture.

On the other hand, those who love (and even those who hate e-mail) will give you numerous evidences of its advantages. Between them we could mention the possibility of getting information very quickly wherever we are, hence, to be aware of the latest events in the world. Moreover, e-mail gives us the possibility to express our feelings with the help of the signs we all perfectly know (J, L, etc.). Even sending flowers attached to a message (good economy for boys!) and other nice pictures is possible today.

As far as business is concerned, the normal functioning of any company is a synonym of normal functioning of our mail boxes in the office. Guess what is the first action every employer does (automatically already!) having just entered his office in the morning without pulling his coat off? Right: he checks his mail! We have such a deep affection for it that colleagues in the neighboring offices make no efforts to say "hello!" to each other during a personal meeting in the morning, but send mails with greetings.

Still these greetings by e-mail are nothing but positive if you are far from your office and must maintain contact with the directors and employers. E-mail helps you to get "fresh" news and, consequently, to react in time. You have also the possibility to book hotels and plane tickets - which makes your travel simpler, and to buy books and other goods - which makes your life nicer.

The best proof of the importance of e-mail in today's business life would be the fact that without it all activities within a company are paralyzed. But even having the opportunity to send to each other lots of messages, let's not forget the simple skills of face-to-face communication.

(By Alevtina Kozina)

But are the last ones satisfied with it? It's definitely a debatable question.

Being an Internet user for some years I have met different kinds of problems. They were the disconnection while writing or sending an important letter, the e-mail address could be out of order for a couple of days (approximately), or the addressee simply didn't get my letter. Among other serious kinds of problems, there is the long time for sending a big quantity of information, such as photos for instance. Surely, the most widespread problem in e-mails is time of the delivery. It can be some seconds or some hours. So here are no guarantees. Well, these are the disadvantages.

What about the advantages? They are obvious. E-mail is the easiest means of Internet connection, and doesn't require additional Knowledge and skills except for the basic, the simplest ones. Even a child can push the colored buttons on the screen and sort the things out. So, e-mail is a profitable industry. Each owner of this service tries to make it more convenient for users, to be chosen among the other competitors.

E-mail, above all, is the most habitual way of association and for most people it's better to put up with all the inconveniences, than to search for another way of sending their mail. But the situation is changing very quickly. Young users more often use many other means of sending information at the present time. These are various kinds of on-line chats, for example ICO, which allows you to send and receive information immediately - saving time.

But what to do if you communicate with a foreigner and yet don't have enough skills to speak and write quickly Of course, if he has a lot of time and he is a kind and rich fellow, he'll wait for your answers, but if he is not?

And if the time of talking is not convenient to you?

The best decision for you in this case is e-mail. You can write when you want, taking as much time as you need and correct all the mistakes E-mail is appropriate exactly for such situations.

So, in our days e-mail becomes similar to the telephone. The phone still exists and a lot of people use it. But it's imperfect In spite of all, it’s a part of almost everyone's life. We all use it anyway for different aims. Each has their own reasons.

I don't think the situation is going to change significantly soon. And it's possible to curse or praise the e-mail, but it has become и friend tested in time. It's early for its competitors to "cream off"!

(By Maria Yaylenko)

Task 3. Read the articles again and answer the following question:

1. What disadvantages of e-mail are illustrated in both articles?
2. What advantages of e-mail are mentioned in these articles?

Task 4. Match the words from the text with their corresponding definitions.

1. to chat	a. an effect or influence
2. to curse	b. making a profit, or giving you a benefit

	or advantages
3. profitable	c. to exchange message with someone using a computer so that you are able to see each other's messages immediately, on the Internet
4. to praise	d. to express strong approval for someone or something, especially in public
5. an impact	e. a large quantity of similar things that happens within a short time
6. maudlin	f. a feature of something that makes it less useful than it could be
7. avalanche	g. to use offensive or impolite language
8. to console	h. talking in a sad and emotional way that seems silly, especially when you are drunk
9. handwriting	i. to try to make someone feel better when they are unhappy or disappointed
10. in comprehensible	j. the particular way someone writes using a pen or pencil
11. drawback	k. impossible to understand

Task 5. Match the sentence halves to form complete sentences.

1. Internet shopping has begun	a. an avalanche of messages
2. You should spend your time	b. that he had at least solved part of the mystery
3. They usually chat	c. to have a serious impact in world competition
4. The companies are fighting	d. in her own handwriting
5. Harry consoled himself with the thought	e. more profitable working in the Internet
6. This letter is	f. that nothing has yet been done about this
7. I find it in comprehensible	g. about nothing in particular on the Internet

Task 6. E-mailers keep their message brief by abbreviating frequently used phrases. Complete these common phrases:

AAMOF	As a m_____ of f_____
AFAIK	As f_____ as I k_____
FYI	For your i_____
FYA	f_____ y_____ am_____
IMO	In my o_____
IOW	In o_____ words
NRN	Not r_____ necessary
TTYL	Talk to y_____ l_____

FAQ	f_____ a_____ question(s)
BTW	By t_____ w_____
KHYF	k_____ ho_____ y_____ fe_____
WYSIWYG	What y__ see is w____ y___ g___
RTFM	Read the f_____ m_____

Task 7. E-mail message usually have the following format:

To: (name and e-mail address of a recipient)
From: (name and e-mail address of a sender)
Subject: (identification of main point of message)
Here is example of an e-mail address:
smith@cup.ac.uk
Note that the symbol @ in e-mail address is read **at** and that the full stops are read as dot. Thus the example address would be read as Smith at C – U – P dot A – C dot U – K.
The ac.uk in the example address tells you that the address is based at university in the United Kingdom.

Do you know anyone with an e-mail address? Dictate it to other students in the class.

Task 8. E-mailers make use of symbol called smileys (or emoticons) which can be written using standard letters and signs.

:-) Your basic smiley. This is used to mean I'm happy.
;-) Winking smiley. I'm flirting or being ironic.
;-(Frowning smiley. I did not like something.
:-| I'm indifferent.
8-) I wear glasses.
:-{) I have moustache.
:-~) I have a cold.
C=:^) Head cook, chef-de-cuisine.
Q:^) Soldier, man with beret, boy scout.
*:O Clown face; I'm feeling like a buffoon.
:^9 Licking the lips; very tasty or delicious.

Task 9. Match these smileys to their meanings listed below. Some meanings don't have any smiles in the given list.

%-) (-: |-| :-Q :-@ :-D <:-| (:) [:-)

1.I'm a dunce.
2.I'm an egghead.
3.I'm asleep.
4.I'm laughing.
5.I'm left-handed.
6.I'm screaming.

7. I'm wearing a Walkman.
8. I'm sticking my tongue out at you.
9. I've been staring at this screen for too long.

Task 10. Write an e-mail message to your friend (on paper). Use an appropriate format and a chatty style. Try to use at least one smiley and some abbreviations.

Task 11. Discussion and debate.

PERSONAL DATA

1. name
2. address
3. e-mail address
4. family details
5. racial and ethnic origin
6. social security number
7. educational records: examinations/qualifications/training, etc.
8. employment situation: current job/salary/previous position, etc.
9. driving details: car/license number/driving record and offences
10. medical records: weight/height/blood group/allergies/serious illnesses
11. banking details: accounts/amounts/loans, etc.
12. criminal record: any offences/fines/prison, etc.
13. use of on-line services: how much use you make of the Internet and which sites
14. political opinions: party membership, etc.
15. membership of organizations and trade unions

a) Read the list of items in the personal data chart that could be held on computer. Put a tick against the items you feel you could accept, and a cross against those you feel you could not.
b) Get into groups of 3 to 5. Rank the items in the personal data chart in order of how acceptable each would be for inclusion in computer data files, i.e. 1 is the most acceptable and 15 is the least acceptable.
c) Read out your list to the other groups. Write down the other groups' rankings next to each item as you listen. Is there a consensus?

Unit 6

Telecommunications Systems in Education

Task 1. Discuss the following questions with your groupmates:
Do you use technology in your studies? If so, what kind(s) of technology do you use and how?
Does it help you in your learning?

Task 2. Read about the use of technology for study purposes in the USA. Make comments on providing the same in Ukraine; in your university.

Across the state of Washington, students and educators from kindergarten through graduate school are using technology to speak to one another, learn from one another, and explore the world and universe in new ways. A second-grade class in Burlington recently visited NASA via live videoconference. Steilacoom-area high school students conducted a real-time, two-way video conversation with high school students in South Africa, sharing opinions about politics, violence, lifestyles, technology and music. A disabled adult college student working and living in rural Grays Harbor County pursued a long-distance college degree to get the skills to land a better job in her own community. These examples provide just a glimpse of the many extraordinary stories detailed in this publication - dozens of vignettes about how educators are taking advantage of the K-20 Educational Telecommunications Network to help young and adult students flourish academically and professionally. And these stories are only the beginning. The use of technology is growing exponentially across the state as educators and students bring creative ideas and practices to life, and as schools identify the means to fully tap the vast potential of the K-20 Network.

Task 3. Read what Dr. Terry Bergeson, a school superintendent, says about the use of technology to transform learning and speak about the benefits of the use of technology for both students and teachers.

One of State School Superintendent Dr. Terry Bergeson's Seven Keys to Successful Schools is to use the power of technology to transform learning. "We want to make sure all children have exposure to technology because it's an integral part of life and work today," she said. "This means connecting students and staff to the Internet and helping them tap its potential, funding technology as a part of basic education, and giving teachers technology tools that will help them analyze students' achievements, progress and learning gaps."

Task 4. Read the following paragraph and say what it is about. What points do you agree or disagree with?

"In today's world, technology skills are required for all kinds of careers, not just those in the high-tech industry," said Earl Hale, executive director of the State Board for Community and Technical Colleges. "Computer literacy is a baseline requirement for almost any job. Washington businesses are demanding workers who are well-educated and skilled in information technology. Having the K-20 Network to support training in technical and business applications helps build our workforce and supports our information-based economy."

"Technology and communications are creating thousands of new, well-paying jobs in our state every year," says Marc Gaspard, executive director of the State Higher Education Coordinating Board. "If we want to ensure that our citizens have the skills and education to compete for these good jobs, we have to broaden the learning opportunities available and reach out to those who otherwise would not be in school. That means offering our citizens the opportunity to pursue advanced training or a college degree anytime, anywhere."

Through the K-20 Network, students at Washington colleges and universities can enroll in distance learning courses, access library resources, and take advantage of high-speed, high-bandwidth computer connections.

Task 5. Discuss the following:

Do you agree or disagree with the following statement? "With the help of technology, students nowadays can learn more information and learn it more quickly". Use specific reasons and examples to support your answer.

Task 6. Write an essay on the following topic:

In the future, students may have the choice of studying at home by using technology such as computers or television or studying at traditional schools. Which would you prefer? Use specific details to explain your choice.

Unit 7

Task 1. Look at the following words from the text. In groups, predict what kind of text you are going to read. Then read the text to see if your original predictions were correct.

CATV, high-speed connection, coaxial cable.

How Cable Modems Work

For millions of people, television brings news, entertainment and educational programs into their homes. Many people get their TV signal from cable television (CATV) because cable TV provides a clearer picture and more channels. (See How Cable TV Works for details.)

Many people who have cable TV can now get a high-speed connection to the Internet from their cable provider. Cable modems compete with technologies like asymmetrical digital subscriber lines (ADSL). If you have ever wondered what the differences between DSL and cable modems are, or if you have ever wondered how a computer network can share a cable with dozens of television channels, then read onjn this article, we'll look at how a cable modem works and see how 100 cable television channels and any Web site out there can flow over a single coaxial cable into your home.

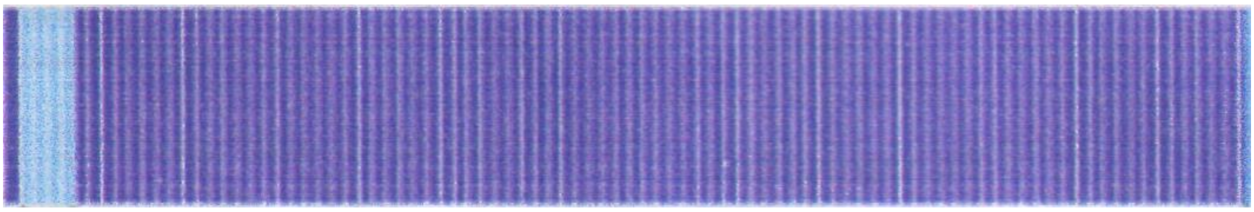
Extra Space

You might think that a television channel would take up quite a bit of electrical "space," or **bandwidth,** on a cable. In reality, each television signal

is given a 6-megahertz (MHz, millions of cycles per second) channel on the cable. The **coaxial cable** used to carry cable television can carry hundreds of megahertz of signals - all the channels you could want to watch and more. (For more information, see How Television Works.)
In a cable TV system, signals from the various channels are each given a 6-MHz slice of the cable's available bandwidth and then sent down the cable to your house. In some systems, coaxial cable is the only medium used for distributing signals. In other systems, fiber-optic cable goes from the cable company to different neighborhoods or areas. Then the fiber is terminated and the signals move onto coaxial cable for distribution to individual houses.

6 MHz/channel

0 MHz-- -------------------------- ------------------ ......—***m*** **1OOO MHz**



• 5 65 MHz
890 MHz+
Upstream
Downstream

Streams

When a cable company offers Internet access over the cable, Internet information can use the same cables because the cable modem system puts **downstream** data ~ data sent from the Internet to an individual computer - into a 6-MHz channel. On the cable, the data looks just like a TV channel. So Internet downstream data takes up the same amount of cable space as any single channel of programming. **Upstream** data –

information sent from an individual back to the Internet - requires even less of the cable's bandwidth, just 2 MHz, since the assumption is that most people download far more information than they upload.
Putting both upstream and downstream data on the cable television system requires two types of equipment: a **cable modem** on the customer end and a **cable modem termination system** (CMTS) at the cable provider's end. Between these two types of equipment, all the computer networking, security and management of Internet access over cable television is put into place.

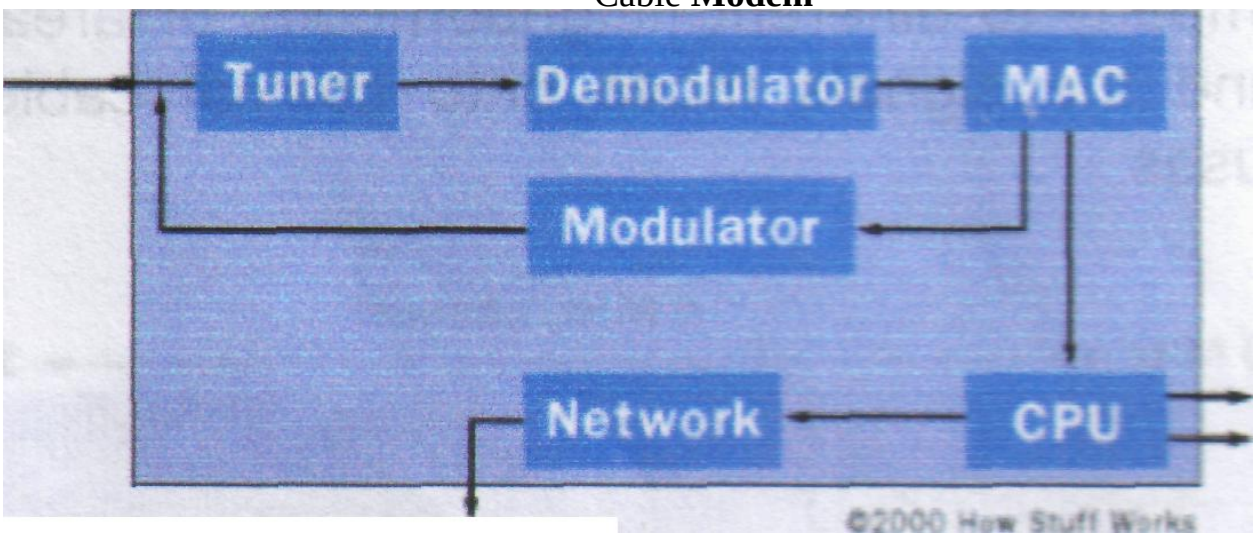
Inside the Cable Modem

Cable modems can be either internal or external to the computer. In some cases, the cable modem can be part of a set-top cable box, requiring that only a keyboard and mouse be added for Internet access. In fact, if your cable system has upgraded to digital cable, the new set-top box the cable company provides will be capable of connecting to the Internet, whether or not you

receive Internet access through your CATV connection. Regardless of their outward appearance, all cable modems contain certain key components:

. A tuner
• A demodulator
• A modulator
. A media access control **(MAC)** device
• A microprocessor

Cable **Modem**



TV

To computer
(enthernet/ USB)

Tuner

The tuner connects to the cable outlet, sometimes with the addition of a **splitter** that separates the Internet data channel from normal CATV programming. Since the Internet data comes through an otherwise unused cable channel, the tuner simply receives the modulated digital signal and passes it to the demodulator.

In some cases, the tuner will contain a **diplexer,** which allows the tuner to make use of one set of frequencies (generally between 42 and 850 MHz) for downstream traffic, and another set of frequencies (between 5 and 42 MHz) for the upstream data Other systems, most often those with more limited capacity for channels, will use the cable modem tuner for downstream data and a dial-up telephone modem for upstream traffic. In either case, after the tuner receives a signal, it is passed to the **demodulator.**

Demodulator

The most common demodulators have four functions. A quadrature amplitude modulation (QAM) demodulator takes a radio-frequency signal that has had Information encoded in it by varying both the amplitude and phase of the wave, and turns it into a simple signal that can be processed by

the analog-to-digital (A/D) converter. The A/D converter takes the signal, which varies in voltage, and turns it into a series of digital 1s and 0s. An error correction module then checks the received information against a known standard, so that problems in transmission can be found and fixed. In most cases, the network **frames,** or groups of data, are in MPEG format, so an MPEG synchronizer is used to make sure the data groups stay in line and in order. **Modulator**

In cable modems that use the cable system for upstream traffic, a modulator is used to convert the digital computer network data into radio-frequency signals for transmission. This component is sometimes called a **burst modulator,** because of the irregular nature of most traffic between a user and the Internet, and consists of three parts:

- A section to insert information used for error correction on the receiving end
- A QAM modulator
- A digital-to-analog (D/A) converter

MAC

The MAC sits between the upstream and downstream portions of the cable modem, and acts as the interface between the hardware and software portions of the various network **protocols.** All computer network devices have MACs, but in the case of a cable modem the tasks are more complex than those of a normal network interface card. For this reason, in most cases, some of the MAC functions will be assigned to a central processing unit (CPU) -- either the CPU in the cable modem or the CPU of the user's system.

Microprocessor

The microprocessor's job depends somewhat on whether the cable modem is designed to be part of a larger computer system or to provide Internet access with no additional computer support. In situations calling for an attached computer, the internal microprocessor still picks up much of the MAC function from the dedicated MAC module. In systems where the cable modem is the sole unit required for Internet access, the microprocessor picks up MAC slack and much more. In either case, Motorola's PowerPC processor is one of the common choices for system designers.

Pros and Cons

If you are one of the first users to connect to the Internet through a particular cable channel, then you may have nearly the entire bandwidth of the channel available for your use. As new users, especially heavy-access users, are connected to the channel, you will have to share that bandwidth, and may see your performance degrade as a result. It is possible that, in times of heavy usage with many connected users, performance will be far below the theoretical maximums. The good news is that this particular performance issue can be resolved by the cable company adding a new channel and splitting the base of users.

Another benefit of the cable modem for Internet access is that, unlike ADSL, its performance doesn't depend on distance from the central cable office. A

digital CATV system is designed to provide digital signals at a particular quality to customer households. On the upstream side, the burst modulator in cable modems is programmed with the distance from the head-end, and provides the proper signal strength for accurate transmission.

Notes:
MPEG (Motion Picture Experts Group) – экспертная группа по движущимся изображениям. Формат графических файлов, разработанный Motion Picture Experts Group, в котором видеоизображение сжимается и хранится в определенном формате.

Task 2. Read the text and guess about the meaning of the words in bold from the context (by looking at the surrounding words or situation).

Task 3. Complete the following sentences with the words from the text.

1. A piece of equipment that changes the form of something, especially so that it can be more easily used is called _____.
2. A piece of electronic equipment that allows information from one computer to be sent along telephone wires to another computer is called _____.
3. The amount of information that can be carried through a telephone wire, computer connection, etc. at one time is called _____.
4. The central chip in a computer, which controls most of its operations, is called _____.

Task 4. Complete these sentences using the correct form of the word in capitals. There are two sentences where you don't need to change the word.

1. In a cable TV system, signals from a ……. of channels are given a 6-MHz slice of the cable's available bandwidth. **VARIOUS**
2. In some systems, coaxial cable is the only medium used for signal …….. . **DISTRIBUTING**
3. The new computer system will meet all our ……. . **REQUIRE**
4. Users can ……. their voice mail remotely. **ACCESS**
5. A splitter is used to ……. the Internet data channel from normal CATV programming. **SEPARATE**
6. Cable modems and asymmetrical digital subscriber lines are ……. . **COMPETE**

Task 5. Using the diagrams describe how a cable modem works.

Task 6. Speak about advantages and disadvantages of cable modems.

Task 7. Read a paragraph about pros and cons of a cable modem and compare your ideas.

Test 8
(Module Test)

Task 1. Discuss the following questions.

1. Do you have a mobile phone? If so, how long have you had it? How important is it to you?
2. Do you send and receive text messages? How often? What are they usually about?
3. What do these messages mean?

a) S U L8R b) r u OK c) Thx 4 yr msg

Check your answers on p.29

Task 2. You are going to read a newspaper article about mobile phones and email. Read the title and subheading of the article. How do you think email and text messaging might be 'changing the way people relate to each other'? Read the first paragraph and compare your ideas.

Now we're getting the message

Text messaging and email are changing the way people relate to each other. Sara Gaines reports

0 _____

When computers first started to be used on a wide scale, some people predicted that we would spend so long staring at computer screens that we would end up forgetting how to talk to one another. But in fact, the rapid expansion of electronic communication in the 21st century has had the opposite effect. Rather than retreating into themselves, people are using new technology, in particular email and text messaging, to find more and more ways to expand their *network* of friends.

1 _____

Alice Thompson, 23, is known as the Text Queen to her friends because she sends so many messages. 'My friends and I take our phones out with us and send messages to other friends saying, "We're in this club and it's really good. Come and meet us,"' she said. 'It means we don't have to spend ages planning a night out. You can just send the same message to everyone.'

2 _____

Alice has found that text messaging has other advantages too. 'If there is a guy I like, I find it easier to send text messages initially rather than phone him up,' she said. 'Because we're not [2]*face to face*, I don't feel nervous. There

is one guy, [3]*a friend of a friend*, who I don't know that well, but we've started to text message each other and that's how we communicate. I would never have phoned him up but this way it feels OK.'

3 _____

Text messaging and email also help Alice *keep in touch* with old schoolmates she would probably have lost contact with otherwise. She finds it's much easier to send a message saying 'Hi, thinking of you,' rather than having to write a long letter.

4 _____

It seems these forms of communication have filled a gap, offering something that [2]*face-to-face* conversation does not. Professor Pam Briggs, a psychologist at the University of Northumbria, believes they have become popular because they offer people a chance to present themselves in the way that they want to. 'People seem to really enjoy sending text messages and emails,' she says. 'They can take their time planning their message, and they can be a bit more playful, adding jokes and little bits of video clips and so on. They prefer it to the *'one-to-one* communication of speaking on the phone to each other - maybe also because this way they can choose when they want to respond to someone.'

5 _____

The fact that text messages are so quick and easy is a big part of the attraction. Many people also find text messaging more informal than making a phone call or writing a letter, and therefore simpler to use. Annabelle Rose, who teaches at a London sixth form college, uses email and text messaging to keep in touch with her students. They often email or text her with questions about their work. 'They don't find it so difficult to keep in touch that way, whereas they might feel that a phone call is more of an interruption,' she said. 'I have always given my number out to students and told them to call me if they have any problems. But no one ever did before text messaging really started taking off.'

6 _____

So is it all good? Annabelle has identified one negative result of text messaging. 'The popularity of this way of writing among my students can cause a few difficulties as they have started using these abbreviations in their normal writing, like writing 'tomoro' for tomorrow,' she said. 'But they are never rude. If I text them back answering their queries, they always send another message saying 'Thx', even though it's not really necessary.' (*Adapted from* THE GUARDIAN)

Task 3. The following questions focus on the main idea of each paragraph. Read the text paragraph by paragraph and highlight the words or phrases that answer each question. Paragraph 0 has been done for you.

Paragraph 0: What is surprising about the way computer use has developed?
Paragraph 1: What's one advantage for Alice of text messaging?
Paragraph 2: Why does Alice prefer to send a text message to someone she doesn't know well, rather than speak to them directly?
Paragraph 3: What other group of people does Alice use modern technology to keep in touch with?
Paragraph 4: Professor Briggs gives three reasons for the popularity of text messaging and email. What are they?
Paragraph 5: What does Annabelle Rose use email for?
Paragraph 6: What does she dislike about the text messages she receives?

Task 4. Using your answers in Task 3 to help you, choose the most suitable heading from the list A-H foe each part (1-6) of the article. There is one extra heading which you do not need to use. There is an example at the beginning (0).

A The only problem
B Making it personal
C Future possibilities
D No need to think ahead
E Maintaining friendships over the years
F A more serious purpose
G Confidence to make the first move
H An expected benefit

Task 5. Discuss these questions.

1. The article mentions several advantages of mobile phones and emails. Can you think of any more?
2. Do you agree with Annabelle that text messaging is encouraging bad habits of spelling and grammar? What other problems are there?

Task 6. Match the adjectives on the left to their synonyms on the right.

1)	advantages	a) hard
2)	quick	b) benefits
3)	to call	c) impolite
4)	difficult	d) rapid
5)	rude	e) to telephone

Task 7. Complete these sentences using the correct form of the word in capitals.

1. What ……. me most to the job was the chance to travel.
ATTRACTION
2. He's finding it ……. to get a job. **DIFFICULTY**
3. No further changes were considered ……. . **NECESSITY**
4. The ……. of the Internet has soared. **POPULAR**
5. The computer industry has ……. greatly over the last decade.
EXPANSION

Task 8. Match the numbered words and phrases in the text to the following meanings.

a)stay in contact
b) a group of people or things that are connected in some way
c)someone you know indirectly
d) between only two people
e)looking directly at someone

Underline three more phrases in the text (e.g. phrasal verbs and collocations) that you would like to remember and use.

Answer to Task 1: a) See you later. b) Are you OK? c) Thanks for your message.

ADDITIONAL TEXTS

Our world is becoming an increasingly complex place in which, we are very dependent on other people and organizations. An event in some distant part of the globe can rapidly and significantly affect the quality of life in our home country.

This increasing dependence, on both a national and international scale, forced us to create systems that can respond immediately to dangers, enabling appropriate defensive or offensive actions to be taken. These systems are operating all around us in military, civil, commercial and industrial fields.

A worldwide system of satellites has been created and it is possible to transmit signals around the globe by bouncing them from one satellite to an earth station and then to another satellite and so on.

Originally designed to carry voice messages, they are able to carry hundreds of thousands of separate simultaneous calls. These systems are being adopted to provide for business communications, including the transmission of voice and facsimile messages, data and video data.

It is probable that future wide use of satellites in the area of telecommunications will provide a great variety of information services to transmit directly into our homes, possibly including personalized electronic mail. The electronic computer is at

the heart of many such systems, but the role of telecommunications is not less important. There will be a further convergence between the technologies of computing and telecommunications. The change of this kind will lead us to the database culture, the cashless society, the office at home, the gigabyte-per-second data network.

One cannot doubt that the economic and social impact of these concepts will be very significant. Already, advanced systems of communication are affecting both the layman and the technician.

The new global satellite-communication systems offer three kinds of service.

The first one is voice messages. Satellite telephones are able to make calls from anywhere on the Earth to anywhere else. That make them especially useful to use in remote, third-world villages (some of which already use stationary satellite telephones), for explorers. Today's mobile phones depend on earth-bound transmitters, whose technical standards vary from country to country. Satellite telephones can solve this problem, but it is not a cheap service.

The second service is messaging. Satellite messages have the same global coverage as satellite telephones, but carry text alone, which is extremely useful for those with laptop computers. As we see, the Internet works in space too. The only problem for ordinary users is one-way transmissions. This problem is solved by using combine transmissions, when you make a call using land communications and receive ordered information through your satellite plate.

The third service is tracking. Voice and messaging systems also tell their users where they are to within a few hundred meters. Combined with the messaging service, the location service could help rescue teams, to find lost adventurers, the police to find stolen cars, exporters to follow the progress of cargoes and so on. Satellite systems provide better positioning .information to anyone who has a receiver for their signals. Satellite method of communication is the future for all kinds of telecommunications.

Television

From Wikipedia, the free encyclopedia.

Television is a telecommunication system for broadcasting and receiving moving pictures and sound over a distance. The term has come to refer to all the aspects of television programming and transmission as well.

History

A semi-mechanical analogue television system was first demonstrated in London in February 1924 by John Logie Baird and a moving picture by Baird on October 30, 1925. The first long distance public television broadcast was from Washington, DC to New York City and occurred on April 7,1927. The image shown was of then

Commerce Secretary Herbert Hoover. A fully electronic system was demonstrated by Philo Taylor Farnsworth in the autumn of 1927. The first analogue service was WGY, Schenectady, New York inaugurated on May 11, 1928. CBS's New York City station began broadcasting the first regular seven days a week television schedule in the U. S. on July 21, 1931. The first broadcast included Mayor James J. Walker, Kate Smith, and George Gershwin. The first all-electronic television service was started in Los Angeles, CA by Don Lee Broadcasting. Their start date was December 23,1931 on W6XAO - later KTSL. Los Angeles was the only major U. S. city that avoided the false start with mechanical television.

The first live transcontinental television broadcast took place in San Francisco, California from the Japanese Peace Treaty Conference on September 4, 1955.

TV Sets

The earliest television sets were radios with the addition of a television device consisting of a neon tube with a mechanically spinning disk (the Nipkow disk, invented by Paul Gottlieb Nipkow) that produced a red postage-stamp size image . The first publicly broadcast electronic service was in Germany in March 1935. It had 180 lines of resolution and was only available in 22 public viewing rooms. One of the first major broadcasts involved the 1936 Berlin Olympics. The Germans had a 441 line system in the fall of 1937. (Source: Early Electronic TV)

Television usage skyrocketed after World War II with war-related technological advances and additional disposable income. (1930s TV receivers cost the equivalent of $7000 today (2001) and had little available programming.)

Television in its original and still most popular form involves sending images and sound over radio waves in the VHF and UHF bands, which are received by a receiver (a television set). In this sense, it is an extension of radio.

Color television became available on December 30, 1953, backed by the CBS network. The government approved the color broadcast system proposed by CBS, but when RCA came up with a system that made it possible to view color broadcasts in black and white on unmodified old black and white TV sets, CBS dropped their own proposal and used the new one.

Starting in the 1990s, modern television sets diverged into three different trends:

standalone TV sets; integrated systems with DVD players and/or VHS VCR built into the TV set itself (mostly for small size TV with up to 17" screen, the main idea is to have a complete portable system); component systems with separate big screen video monitor, tuner, audio system which the owner connects the pieces together as a high-end home theater system. This approach appeals to videophiles who prefer components which can be upgraded separately.

There are many kinds of video monitors used in modern TV sets. The most common are direct view CRTs for up to 40" (4:3) and 46" (16:9) diagonally. Most big screen TVs (up to over 100") use projection technology. Three types of projection systems are used in projection TVs: CRT based, LCD based and reflective imaging

chip based. Modern advances have brought flat screens to TV that use active matrix LCD or plasma display technology. Flat panel displays are as little as 4" thick and can be hung on a wall like a picture. They are extremely attractive and space-saving but they remain expensive.

Nowadays some TVs include a port to connect peripherals to it or to connect the set to an A/V home network (HAVI), like LG RZ-17LZ10 that includes a USB port, where one can connect a mouse, keyboard and so on (very interesting for WebTV).

Even for simple video, there are five standard ways to connect a device. These are as follows:

Component Video- three separate connectors, with one brightness channel and two color channels, and is usually referred to as Y, B-Y, R-Y or Y Pr Pb. This provides for high quality pictures and is usually used inside professional studios. However, it is being used more in home theater for DVDs and high end sources. Audio is not carried on this cable.

SCART- A large 21 pin connector that may carry Composite video, S-Video or for better quality, separate red, green and blue (RGB) signals and two-channel sound, along with a number of control signals. This system is standard in Europe but rarely found elsewhere.

S-Video- two separate channels, one carry brightness, the other carrying color. Also referred to as Y/C video. Provides most of the benefit of component video, with slightly less color fidelity. Use started in the 1980s for S-VHS, Hi-8 and early DVD players to relay high quality video. Audio is not carried on this cable.

Composite video- The most common form of connecting external devices, putting all the video information into one stream. Most televisions provide this option with a yellow RCA cable. Audio is not carried on this cable.

Conference Calls

In the corporate world, there are actually two different meanings attached to the term conference

calls. One addresses the technological aspects, while the other is more concerned with financial

matters. Both definitions of conference calls are very important when trying to conduct business over vast distances. The first definition of conference calls should be very familiar to those who spend at least part of their day attending business meetings. Before the advent of modern telecommunications, if an executive from New York wanted to discuss a new project with engineers in California and salespersons in Chicago, he or she would have to book a meeting room, pay for room and board, arrange for travel and hold marathon work sessions for maximum benefit. As long-distance communications improved, the concept of conference calls became

more and more appealing. Instead of physically meeting in one location, executives can now discuss company plans through conference calls. A group of engineers in California can participate in a multi-line call with executives in New York through a special conference phone with a loudspeaker. These types of conference calls can save a company literally thousands of dollars in travel expenses and time lost in transit. Modern conference calls can even include video links, as well as real-time email communications and fax transmissions. The second definition of conference calls arose from the world of finance. One of the most important times in a company's fiscal year is the quarterly or annual announcement of stock performance. This information is usually considered so sensitive that only a select number of company representatives can deliver it to the stockholders. In order to release this information in an organized manner, most publicly-traded companies use conference calls. Stockholders and any other interested parties may receive written notice of upcoming conference calls, or this information may be posted on the Internet. The CEO of Microsoft, for example, may announce a conference call at 2pm PDT on September 22, 2005. At that time, stockholders and Microsoft staffers may all be allowed to hear the official profit and loss statements during the conference call. Conference calls are not the same as stockholder meetings, however. They are often very direct and one-sided. Any analysis of the information released during financial conference calls is usually done after the fact. On any given weekday, there may be hundreds of these conference calls placed worldwide.

Call waiting, call hold, conference call, call divert, Internet

Using the «call waiting» service you may, while speaking to subscriber simultaneously set up a

connection with another one. When new subscriber appears on the line while you are talking you

will be notified by several short beeps. At that instead of «busy» signal, the person who is calling you will hear beeps of usual call. While you are talking to the first subscriber the sign «call waiting» will appear on the display of your mobile telephone. You can choose either to stop the first call and to start talking to the second subscriber or to hold the first or the second call using the «call hold» feature. «Call hold» gives you the possibility to interrupt current conversation and respond to the incoming call from another subscriber. Without losing the connection you can leave the firs subscriber on «hold» to switch between two subscribers or to make a call yourself while one call is on «hold». «Conference call» will allow you to talk simultaneously with several subscribers (up to 5 persons depending on the mobile phone model). Call divert is a service, which allows you to redirect your incoming

calls to another telephone (city or other mobile telephone) and also to your answering machine. There are 4 types of call diverting:

absolute (all calls are divert); if not answered; if telephone is off or is out of reach;

if the line is busy. All types of call divert could be set up using the menu of your mobile telephone. Some mobile telephone models support also additional types of call divert:

facsimile calls divert; data calls divert. These types of divert work if the «data transmission» or «facsimile transmission» services are ordered. Attention! Be careful while using calls divert service abroad. Absolute calls divert to the selected number or to «Voice Mail» is charged according to Kyivstar GSM tariffs. If using the conditional divert mode («if the line is busy», «if not answered» «if telephone is off or is out of reach») to any number in any country of the world, the call will be charged as the call form Ukraine to the country of stay plus cost of outgoing call according to the tariffs of foreign operator.

What is the Internet?

The Internet is a global network of computers that communicate using a common language. It is

similar to the international telephone system — no one owns or controls the whole thing, but it is

connected in a way that makes it work like one big network. The World Wide Web (WWW or simply the Web) gives you a graphical, easy-to-navigate interface for looking at documents on the Internet. These documents, as well as the links between them, comprise a "web" of information. Files, or pages, on the Web are interconnected. You connect to other pages by clicking special text or graphics, which are called hyperlinks. Pages can contain text, images, movies, sounds —just about anything. These pages can be located on computers anywhere in the world. When you are connected to the Web, you have equal access to information worldwide. Hyperlinks are words or graphics that have Web addresses embedded in them. By clicking a hyperlink, you jump to a particular page in a particular Web site. You can easily identify a hyperlink. Hyperlink text is usually a different color from the rest of the text on a Web page, and hyperlink graphics often have a colored border. Each Web page, including a Web site's home page, has a unique address called a Uniform Resource Locator (URL), for example, http://www.microsoft.com/home.htm. The URL specifies the name of the computer on which the page is stored and the exact path to the page.

10-Gigabit Ethernet—Mastering the Migration

If the 10-Gigabit Ethernet (GBE) market behaves anything like the 1-Gigabit Ethernet market has, network managers can expect a 10-fold increase in backbone-type bandwidth in less than two years. 10-GBE technology is the subject of intense development by switch vendors and laser component makers alike, who are racing to reduce costs and be first to market.

Against this backdrop, the industry is rallying to get a 10-Gigabit Ethernet standard—802.3ae—and the IEEE is expected to approve a final set of standards in early 2002. Even before the standard is finalized, however, pre-standard 10-GBE products will be offered.

Meanwhile, the 1-GBE market continues to grow rapidly. According to Greg Collins, a director at the Dell'Oro Group, 1.3 million 1-GBE switch ports shipped in 1999, and the forecast for 2000 is 4.4 million ports. Also, 110,000 1-GBE network interface cards (NICs) shipped in 1999, and this number is expected to grow dramatically as copper lOOOBaseT NICs from Alteon Web Systems, Intel and SysKonnect become available.

A major driver for growth is that prices are expected to plummet as manufacturing ramps up to mass-production levels. Today's copper NIC is priced at about $900, says Collins; this is projected to fall below $500 by the end of 2000.

In short, the 1-GBE market is hot and expectations are high for 10-GBE, provided that the standards efforts stay on track and low-cost physical layer optical components are developed. While the 10-GBE market is going to take a few years to develop and many things could still change, getting prepared is good strategy.

The Long And Short Of It

Industry observers expect 10-GBE will make its impact felt—in both enterprise and carrier networks. Rod Wilson, director of the 10 GB Ethernet Project at Nortel Networks thinks that 10-Gigabit Ethernet will roll out first in service provider networks. "10-Gigabit Ethernet will become a integral part of the service provider's point of presence," Wilson said. It will be "the technology that helps carriers address bandwidth growth and allows them to offer profitable differentiated services over IP."

But 10-GBE faces significant barriers in the longer-haul market, including high component costs and a lack of telecom-class standards. "The optical laser components are not cheap. The cost of just a long-haul transceiver pair is about $40,000 now," Wilson said. Nortel has made a multimillion dollar investment in 10-Gigabit Ethernet technology, and is betting that mass production and greater

economies of scale will push down the cost of long-haul transceivers by 2003 to less than one-fourth the current price.

But cost isn't the only obstacle. Carriers have different operations- and performance-related requirements than enterprises, and carrier-class standards are needed before the service providers jump in. As Wilson put it: "Carriers need to build reliable networks. The 10-Gigabit Ethernet standards need to incorporate some of SONET's reliability features, and support trunking and provisioning."

The 10-GBE Task Force grew out of the efforts of the IEEE 802.3 High Speed Study Group in 1999. The Task Force plans to complete the standard next March, according to Jonathan Thatcher, chair of IEEE 802.3ae committee. He told BCR, "I'm optimistic that we will hit the scheduled date [although] it will be difficult and there will be a lot of work. But I feel we can complete the standard on schedule."

The group will next meet on May 23-25 in Ottawa, Canada to brainstorm and have an open discussion of proposals. "We will entertain any and all submissions until July, at which point we will refine a core set to move on as standards," said Thatcher.

Crucial Physical Interfaces

Though the standard will make provision for 10-GBE as a carrier service, the technology may also be suited for the LAN backbone, according to the Dell'Oro Group's Greg Collins. Bandwidth requirements for switched internetworks are growing, and 10-GBE simplifies backbone management, Collins said: "High-volume sites [i.e., wiring closets] that currently deploy multiple 1-GBE lines and use link aggregation to combine the bandwidth into a single logical link will welcome 10-GBE."

Indeed, the Task Force is also working on problems relevant to LAN applications, primarily the physical layer. For the short haul, there are several competing, optically-based, physical layer standards. The key issues are price and performance, because the market for future 10-GBE systems depends to a great degree upon the availability of low-cost components.

According to Bruce Tolley, product manager for Cisco's enterprise business line and vice-chair of the Task Force, the group's goals for media and distance are: At least 100 meters on installed multimode (MM) fiber (low-cost option) At least 300 meters on MM fiber, (higher-cost option) At least 2 km on single-mode (SM) fiber (last mile) At least 10 km on SM fiber (regional) At least 40 km on SM fiber (longer haul)

According to Tolley, the top contenders for 10 GBE serial PMDs (physical media dependent sub layers) are:

300 meters, 850 nm, Vertical Cavity Surface Emitting Laser (VCSEL), new multimode fiber (serial transmission approach using a single wavelength laser) 2 km,

1310 nm, Fabry-Perot (FP) laser, singlemode 10 km, 1310 nm, Distributed Feedback (DFB) or VCSEL, singlemode 40 km, 1310 nm, DFB, cooled, singlemode 40 km, 1550 nm, DFB, singlemode.

In addition, there are a number of non-serial transmission methods proposed. Unlike the serial data stream proposals, which use one laser per wavelength, the non-serial proposals use multiple 2.5 Gbps semiconductor lasers in parallel to create a 10 Gbps bitstream.

The underlying technology for these proposals, VCSEL, is a promising technology that was the basis for Gigabit Ethernet optics. In contrast to long-haul laser technology, VCSEL is intended only for data communications at shorter distances.

According to Cisco's Tolley, "There is at least one VSCEL proposal before the IEEE 802.3ae 10-GBE Task Force. Lucent has published some experimental results showing this is possible, and I believe a couple of startups are also interested in VCSEL for this application." Agilent Technologies, for example, is promoting a system with four separate VCSEL-type lasers, each of which uses its own wavelength. The bitstream is combined and regenerated into a single 10-Gbps pipeline at the endpoints.

The advantage of this approach is cost reduction, according to Bryan Gregory, principal at Technical Essence Webs, a market research firm that tracks 10-GBE technology. "Agilent already sells a sub-$100 1-GBE optical transceiver component that uses four VCSEL lasers. They can potentially lower the cost to under $1,000 per pair of 10-Gbps transceivers by 2002." Gregory tempers his projection, however. "The physical layer optics that implements 10-Gigabit Ethernet is an emerging technology. It is such a critical piece, but we really don't know which PHY approaches will make it in LAN, MAN and WAN markets," he said. "Today you can buy OC-192 SONET-style optics, but they are too expensive and really not designed for the LAN technology space." He's optimistic, however, that vendors are attacking the problem. "The companies that delivered on low-cost 1-GBE components are busy refining low cost devices for 10-GBE," he said. Some early 10-GBE components surfaced at the Optical Fiber Conference last month. New Focus, which makes fiber-optic products for next-generation optical networks, demonstrated VCSEL lasers that transmitted Ethernet packets at 10 Gbps. In addition, Agilent, Lucent and W.L. Gore, a supplier of fiber optic components, all talked about their 10-GBE component road maps. "I would expect AMP and Molex to also go after the 10-GBE PHY link component market," said Gregory. "These companies are really on the move to drive down costs and bring products to market very quickly. Their success can make or break the 10-GBE LAN market." The bottom line: Gregory believes some sample, pre-standard components will ship to customers by the end of this year, with volume shipments in early 2001 (for a projected timetable of 10-GBE development, see Figure 1). If history repeats itself, this prediction is attainable.

Gigabit Ethernet products began appearing in the market in 1997, which was one year before the completion of the IEEE 802.3z standard.

Gregory projects that about 277,000 10-GBE ports will ship in 2002, and expects this to grow to 5.3 million ports by 2005. System revenue for these 10-GBE ports will grow from $515 million in 2002 to more than $2.2 billion in 2005. Gregory's study is available free of charge at the company's Web site.

10-GBE Alliance

Moving forward, the LAN industry is poised to repeat the effort that brought 1-GBE into the market successfully. Specifically, 3Com, Cisco, Extreme Networks, MCI WorldCom, Nortel, Sun and others have joined the 10-Gigabit Ethernet Alliance.

According to Tony Lee, alliance president and director of product marketing at Extreme, the alliance has two goals: To assist the IEEE 802.3ae standards body by accelerating the pace of technical discussions of the many proposals, and to market the new technology to end users. "We see real applications in the LAN, MAN and WAN markets," said Lee. "I think the technology will first take off in the metropolitan area network in backbone applications, and in service-provider networks. These users are facing the bandwidth crunch now." According to Lee's scenario, the technology will then filter down to enterprise LAN in backbone applications that use multiple 1-Gigabit Ethernet connections and link aggregation for busy backbone connections. While some LAN switch vendors say they will wait to bring 10-Gigabit Ethernet interfaces to market until the standard is nearer completion, others claim to be moving along a faster track. One of the more aggressive developers is Enterasys, Inc., one of the new subsidiaries of Cabletron, Inc. In March, the company announced the Matrix e7 Gigabit Ethernet switch with a 420-Gbps passive backplane (see this issue, pp. 64-66). The new switch is the first in what promises to be a wave of monster switches with enough capacity to handle traffic from multiple 10-Gigabit Ethernet ports. According to Jeff Catlin, Enterasys' general manager of product development, "We will have IP over pre-standard 10-GBE shipping by the end of the year....We will monitor the standards and ship interoperable products after the standards are complete."

Conclusion

The breadth of the 10-GBE market—LAN, SAN, MAN and WAN—makes its potential significance huge. The technology promises a whopping lOx (?)

improvement in bandwidth, while retaining Ethernet's knowledge base and ease-of-use.

However, there are still major potholes around which 10-GBE must maneuver. This includes the pace at which component costs decline—perhaps it won't happen as fast as is currently projected— and the fact that the standards-setting process is notorious for not adhering to predicted schedules. The nature of the specs themselves, and the extent to which they allow for adequate reliability—a must in public telecom networks—is also a key variable to watch.

Still, 10-GBE technology is moving, and a strong case can be made that it will happen sooner rather than later. The optical component and switch vendors have done their pioneering; now it is time for enterprise managers to consider their approach to this new technology. More bandwidth opens up new avenues for faster applications. Prudent enterprise managers should start thinking about 10-GBE and the impact it could have on the networks' future