

13. CHAT, FORUM AND TELECONFERENCING

The creation of an information society, promoted mainly by the development of the internet, requires the creation of software instruments capable of administrating this on an international level. It demanded a **quantity administration** – programs capable of ensuring the compression, the transmission and decompression of a database. In addition programs capable of realizing a **selective administration** were required. Instruments were developed ranging from unspecialized ones with selective possibilities such as chat programs to programs which permit fast information transfer between people who want to discuss a certain subject or domain and including sophisticated instruments such teleconference programs.

This modulus aim to provide an understanding of the basic concepts necessary to understand this international phenomenon and to be capable of participating efficiently and creatively. The modulus is structured into chapters outlining simple chat aspects, forum and specialized forum, text-sound transmissions, text-image transmissions, complex transmissions, real time transmission. Programs are presented and basic instructions are outlined.

13.1. Let's communicate

Communication is an essential element of our existence. We exchange information for a variety of reasons. The chapter aim to underline the **importance of exchanging information**, and how we can make our life easier if we know the right way to receive or send information. The hardware and software necessary to participate are described. The accelerated increase of the existent transmitting information channels capacity and the appearance of new channels leave us facing an immense volume of information. We are going to learn about how we **can exchange information through specialized channels**, hardware and software to narrow down this information to those topics that are of interest to us.

13.1.1. Why do we communicate?

We exist in a vast ocean of information. We communicate **out of pleasure**, when we call or send e-mail to a friend, but also **out of necessity**, for example when we need to communicate that we are going to be late for a meeting. Sometimes it **is vital to communicate** – when we have to call the ambulance in case of an accident. Nowadays, we communicate much more about our finances. We can communicate to our bank to transfer money or to pay us bonds and taxes or we can earn money from transmitting useful information very speedily e.g. reporters and others publishing news in various domains. We can earn money by creating or maintaining communication channels, maintaining computer networks or writing programs.

13.1.2. What do we need to communicate effectively?

Information is not static but **rather dynamic**. It is transmitted between the one who emits and one (or many) receivers, through a communication channel. It is essential that this communication channel does not change the transmitted information in any way before it gets to the receiver. For example, deleting a letter or modifying punctuation mark in a text.

Information should be protected against fraudulent intervention by anybody other than the intendent recipient. This can be achieved either by intervention with the data carrier (sealing a stamp, cable screening, and so on), or by writing the message in code. (coding – un-coding).

13.1.3. *How did our grandparents communicate?*

Communication has always existed. It's vital to exchange information. The type of information, which can send to each other, has evolved. Our grandparents communicated orally, visually or in writing. Sometimes information was sent to a single addressee and oftentimes privacy was of utmost importance. (think of old letters in a museum heavily sealed with wax ?). Information may have also been transmitted to get to the attention of as many people as possible e.g. by church services or cathedral paintings. In this way the first steps to the informatics revolution was created – globalization through easy multiplication of the information data carrier.

The Template of the Module Cover Page

13.1.4. *How did they communicate 30 years ago?*

Our parents have lived through the first steps of a communications revolution. Developments in print, cinematography and audio technology permitted the fast multiplication of information and dissemination but not in real time. Transmission in real time became possible with the discovering of radiophone transmission and radio itself, followed by television. Hence the second step in the information revolution – the immediate transmission of information – was made. In a short time significant developments followed in radio transmission and image. The third step in this information revolution was made with the bi-directional transmission in real time by or the telephone and more recently, by videophone.

13.1.5. *How can we communicate today?*

We have many means of communicating at our disposal. Significant headway in audio, TV, cinematography, telephony has been made. Increasingly the analogical signal transmission is postponed (tension or power variation, e.g. how the coil of a loudspeaker works) as well as the transmission of numerical values, of data. Human receptors are still analogical. We can't hear a large amount of values. We have to transform them into an analogical signal. **Using the representation of any analogical sign** (e.g.. the one produced by a mike or applied to a loudspeaker) **under digital form** (amounts of numerical values) has resulted in a huge development in the way we can **administer information**. This is a result of the extraordinary possibilities of processing numerical data given by computers.

13.1.6. *The Internet - a powerful mean of communication*

The founding of global networks of computers/satellites/and so on offers us the physical support to transmit huge volumes of information. The internet, created 1989 was **the first global network of data exchange**. The fact that this network permits data exchange without being connected to the message from this data, constitutes a new step in the informational revolution. Every signal (audio, image, even smelling or other senses result and so on.) may be represented in the shape of data. These data can be grouped, mingled, sent, separated and reproduced without taking into account the signal signification. This has resulted in the development of complex transmissions. At the same time the Internet destroys another barrier imposed by the old means of communication: It allows **a number of individuals to receive information** simultaneously and in **real time**.

13.1.7. *What to expect in the future*

The development of global communications will lead to major changes in our life style. As personal computers become smaller, lighter more powerful and cheaper people can communicate no matter where they are. This will modify everything about

our relationships with the people around us. At the same time we will be able to administrate money easily without our physical presence. We can already pay bills from a distance. We can get music or movies when we want to. Any one of us can act as news reported. Because these global networks have to be maintained, and constructed (hardware and software) in order to permit their continued functioning and so new jobs are created.

We have to be prepared for all these changes, by knowing how and with what we can change information.

13.1.8. What do we need to communicate using the Internet?

To communicate using the Internet, we need a computer with a connection board to a computer network, which in turn must be connected to Internet. In addition we need an operating and programming system special for navigating the Internet - browsers. Every computer has a serial number in this network - an address, in the form of number row or separate point texts. Data can be sent through Internet and other programs, which don't have a browser interface. For example in banking, broadcasting images and in medicine, and so on. Usually, these programs only ask for the address to send the data or it may already be recorded in their memory. Browsers let us connect to other computers and see a graphic interface, made by a program installed there.

13.1.9. What do we do with so much information?

A huge quantity of information is exists on the Internet. Usually, for accessing Internet information it is necessary for the host computer to have an adequate graphic interface program. Some programmes protect data whereby you need to use a password to access it. To use the network properly we need the addresses of computers which contain suitable information for us. If we don't know such addresses we can use a browser, introducing a word or a row of key words and asking the program to display all the addresses where, through data or graphic interface, these words exist.

13.1.10. How can we filter the information? Specific areas for communication

By using browsers we can find computer addresses where we can exchange information on certain subjects with others. With a computer to which many other computers are connected, everyone can send data from that computer, which sends them to the others. The speed of between the time when I send data and the time it is received depends on the speed that the data is sent by the network and on the performance of the computer to whom everybody connected. The delay also depends on the complexity of the data. If there are huge data volume or data that must be archived compressed or decompressed the delay may be extended. Data can be sent as simple texts, complex voice text transmissions, images and even movies in real time. If you want to change data on a specific subjects it makes sense to be connected to a computer which specialises in this subject. Such computers exist on a wide variety of subjects e.g. medicine domains.

13.2. Chat

There are many possibly ways to communicate by Internet. One way as discussed already is the transmission of electronic letters i.e. e-mail. This method has the advantage that we can send messages which will be received whether the addressee is present or not. In addition it is possible that we can correspond real time, just like when we talk on the phone. This facility is called chat this chapter will explain the many different forms including : instant messenger, ICQ and IRC.

13.2.1. What is chat?

Until 15-20 years ago if we wanted to send someone a message we had two options: sending a letter or making a phone call. The former has the advantage that the receiver will get the letter whether they are there at the time when it is delivered . The telephone allows us a bi-directional instant communication however the receiver must be near the phone (mobile telephony compensates this disadvantage, but there are still problems). Today **chat** provides another opportunity. With chat a central computer gathers all messages together and sends them all to all the users. Actually **everybody can see all the messages sent by anyone who is connected to that computer.**

13.2.2. What do we need to chat?

To "**chat**" **we need as fast an Internet connection as possible**, otherwise we'll see a delay between messages. It operates relatively simply. Every user is connected to a browser (Internet Explorer, Netscape) with a client program and to a server which administrates the written programs. On the internet there are options similar to these facilities: the transmission of electronic messages (e-mail) and on-line communication (chat).

Chat does not imply higher costs than the telephone. It is necessary to have an Internet connection whereby one can send and receive instant messages. One big advantage comparing with the phone is that: many receivers can read the message at the same time and you can see what view many peoples opinions at the same time.

13.2.3. How is chat organized?

Chat is like a discussion in a bar. Everybody talks in the same building, which is the chat server. People can talk in groups of two or an individual can talk in front a table of people. When people **chat virtually**, the table is replaced by a **chat rooms**. When you connect on a chat server you choose a discussion partner and you talk to him only (with agreement) or you enter a room, in which the same subject is discussed or where everybody knows everybody. For example, in a room called #Helpdesk, you can ask questions about the server facilities and someone else who sees your message will reply. The names of these special rooms, called channels, is preceded by <<#>>.

13.2.4. What can we do in chat room?

Every person who enters a chat room identifies themselves with a name. Most of the times, it is a nickname. Every participant sees a list of these names and messages which they sent.

If there are too many users in a room, it may be difficult to follow only the messages that concern you in. In this case you should **choose a partner from the room and create a command in order to let them know you want direct conversation – individual chat.** If your partner agrees, they will give you a confirmation and you will get a window in which to view just your and their messages, No one else will be able to view these messages. Sometimes **a chat room has a supervisor.** Usually they supervises the language used and he **can act when an individual doesn't keep**

the room rules. In the first instance they may be given a notification and, subsequently if they continue to break the rules they may be expelled. The expulsion may be either made for the nickname (the one bearing this nickname cannot enter the room again) or for the computer address.

13.2.5. *Types of chat*

There are many types of chat: **WEB Chat, Instant Messengers, ICQ** and **IRC**. WEB Chat is the easiest. If you have a Java browser (as with the most recent versions of Netscape Navigator and Microsoft Internet Explorer) you can enter, at into a chat room and start to communicate. The Personal Start Page will convey the type of chat. Some WEB chat rooms require installing a browser plug-in, such as e-chat. An example is the chat page of the Netscape browser.

Instant Messaging IM is the most popular type of type.

Another type of chat ICQ which will let you chat, send files, URLs, and much more to others who have installed ICQ.

Unlike the previous examples, IRC (Internet Relay Chat) is not the property of a particular company. To be use IRC you must have an IRC Client program.

13.2.6. *What is Instant Messenger?*

This is usually an exchange between two people but lots of chat servers permit message exchange between many people. When you enter a chat server you choose a nickname so that everybody knows who you are. This nickname is also known as "handle". Chat programs of this type are AOL Instant Messenger, MSN Messenger, and Yahoo Messenger.

The majority of this programs permit the modifying (personalizing) of the graphic interface. It is possible to modify the name you chose for conversation and perhaps add a favorite image with which you wish to be associated.

If your computer allows you to, you can transmit voice and image messages, similar to a phone or video-call. You can also insert a picture selected from your computer memory.

13.2.7. *Instant Messenger for business*

Instant Messenger can be used as a powerful instrument in companies, as a mean of fast and efficient communication between employees. Many companies already consider IM as a more efficient alternative of internal communication than communicating by phone. The advantages given by IM are multiple: you can see who is available, you can send a text taken from another document or images, you can send files associated to the message and you can connect employees over long distances.

Generally with IM it is enough to use a free chat program from the Internet and the message administration is conducted by a server. When a company is involved there are additional **confidentiality requirements**. Chat programmes can be installed in the company servers and can **check on who enters the chat rooms** (configured by the network superintendent) or may **limit access to certain information**. Moreover it is protected by the company firewall program. One of the program is IBM Lotus Sametime.

13.2.8. *AOL Messenger*

One of the **most popular IM program** is **AOL Instant Messenger (AIM)**. As with the majority of the IM programs, AIM uses a personal communicating protocol, which is not compatible to other Instant Messenger programs. One of the reasons for the popularity of AIM is that it permits AOL members to communicate to non-members-other AIM members being capable of using AOL. Moreover, it has extended facilities

to configure the graphic interface. There are approximately 20 million AOL members. It is possible to send not only a nickname but also an associated image. A very important facility of AIM 5.2.3292 is the ability to code messages. For this to happen, the user must buy a digital key (a coding program) which is installed in the computer and used to configure the message. The addressee must know that code if he wants to read the message. In addition to being passworded messages are electronically signed.

The first step to use AOL is to download the (free) program and to install it. Enter the company Web page (www.aol.com) and input the data required by the company (a name that will appear on the message list, a password, an e-mail address, date of birth and rewrite a word which is automatically generated by the server and it is displayed, other data). A web page will appear from which you select AOL version. The download is activated automatically and after this you have to install it. When you login you will be asked for a name and a password, which are verified by the server. If they are correct, the connection is complete and you will be listed in a dialog window where there are a list of icons for instant messenger, chat and e-mail. A window will appear in Instant Messenger, in which you write the name of the individual with whom you want to chat to and text. Push the talk icon. The server will send a warning and your message to that user, and you can begin to exchange information.

If you want to chat push the respective icon and a window will appear. Write the name and a text that will be listed near the name. At the same time, you must introduce the room in which you want to chat, and then push the chat icon.

13.2.9. *What is ICQ?*

ICQ is the short name for "I seek you". It is an application in real time which uses a program, called "client" resident in your computer.

Steps in using ICQ are as followed:

1. go to www.icq.com and download a free copy of the client program, in order to install it in your computer;
2. install the program and open the client application;
3. the client tries to connect to the ICQ server, using a personal protocol ICQ v5;
4. Once the client connects to the server, introduce your name and password. If you enter for the first time an account will be created. For this to happen you have to write a number of coordinates (name, surname, nickname, e-mail address, password, other personal details: date of birth, place of birth etc..). You can select whether other clients can add you to the Contact List or if they have to receive your permission to do this. After registering you will receive an access code.
5. The client sends the IP address to the server, that identifies your computer in the network, and the address of the port used for connection; in addition you will be sent an ICQ contact list;
6. the server creates a temporary file, that contains connecting information for others from the contact lists; then verifies who is connected from the list on the server at that moment; if the server finds other persons it sends them connecting data about you and sends your connecting data to them;
7. the client will display the list of contact persons, indicating "Online" option for those connected;
8. click on a person name from the list, who is online, and a window will open where you can type your text. After typing a message press the "Send" icon to send a message.
9. Since your PC client has your IP address and the number of the port for the computer where the person you want to send the message to, the message will be sent directly to that computer, without including the server in this step; the communication is directly between clients;
10. the other person receives the message and answers; the communicating windows modify in order to display the changed messages

11. when the conversation is complete, close the message window. Eventually, change to offline and exit ICQ; in that moment your client sends a message to the server that the session is off; the server sends a message to all the clients associated to the persons from the contact list and who are online to indicate to them that they have been logged off. Finally the temporary file, is erased. The status associated to your name will become "Offline" for other clients.

When you download ICQ (for free) you will be given an ICQ number. Two or more persons having ICQ may have the same nickname, but there can't be two persons with the same ICQ number. If you want somebody to contact you through ICQ, give them your ICQ number and your nickname in order to avoid mistakes. You can find out more about ICQ at icq.com.

13.2.10. What is IRC?

IRC was initially written by Jarkko Oikarinen in 1988. After being created in Finland it has spread to over 60 countries. **IRC is a multi-user chat system, organized in channels** (rooms, virtual spaces) to talk to groups or individually. There are no restriction concerning the number of persons who can take part in a group or concerning the number of channels.

IRC has some networks which are completely separated from each other. The popular networks include the Undernet, Efnets, DALnet, and so on. If you want to chat to someone using IRC you have to be sure that you are on the same net (you can see it and modify it every time you start the IRC program). If someone else with the same nickname is logged on the net you won't be able to login.

13.2.11. More things about IRC

Unlike AOL, IRC won't protect you against undesirable persons. If you are on AOL and somebody disturbs you, you can report their nickname to AOL and the company will take care of it. There is no central authority in IRC. If you have any problems with another user you have the option to ignore it, by eliminating the messages received from a user with a certain nickname. **In order to participate on the IRC network, it is necessary to have a client program installed on your computer.** Among the most common are IRC, Pirch and Virc for Windows and Ircl for Mac.

After downloading a client programme and installing it on your computer for the first time you will need to give a name, Internet address, nickname and IRC server address to which you want to be connected. Automatically, depending on the location where you downloaded the program, you will have a server address displayed. If you this does not suit, you can select a server from the common structure at the from the right of the image, and select the network and the server. Some client programs have a section where you have to specify the port address, a password, the real name, the e-mail address, a nickname, the IP address and the Local Host name.

13.2.12. Choosing the IRC server

Choosing an IRC server may represents a problem. It is usually (but not always) better to try to connect to the server which is geographical closest. Usually the close servers will work fastest and they will give you unrestricted access. It is better to contact the closest server superintendent to ask for an opinion because this server may already be overcrowded. The majority of the servers permit the unrestricted and anonymous access. If you are asked for a password when you connect, choose another server or contact the server superintendent in order to know if you can get access.

13.2.13. *Abbreviations and symbols*

Some chat rooms confer a written phrase list or colored symbols that can be inserted in the text. At the same time, there are a number of abbreviations and symbols, universally accepted by chat users. The most usual are: :-) is a smile; :- (is a frown; ; -) is a blink of the eye, rather slyly; ~ ~ (is a cry, while :- P is someone who sticks his tongue out. :- P ~ ~ is a slobber. (-: a...left smile, program Among abbreviations are : brb = be right back ; bbiaf = be back in a flash; bbl = be back later; ttfn = ta ta for now; np = no problem; imho = in my humble; lol = laughing out loud; j/k = just kidding; re = hi again, as in "re hi"; wb = welcome back; wtf = what the f—k; rtfm = read the f--king manual; rotfl = rolling on the floor laughing.

13.3. Forum

*Chat allows multiple communication possibilities in real time. E-mail allows us to send messages to one or many users, which can be read at any time after they have been sent. Chat has the advantage of instant messenger, e-mail has the advantage of selectiveness and storing the information. How can I send messages which are selective and can be sent to a group where everyone is interested in the same subject without knowing their addresses? The solution is a **Discussion Forum** server, a place where everyone **interested in a certain theme can send messages which can read at anytime**. If I want to, I can send a reply message that remains on the server or send an e-mail to the sender. The advantage of such a virtual space is that individuals don't have to clog up their own PC's with messages and the can keep in touch to people with the same interests as theirs.*

13.3.1. *What is a Discussion Forum?*

Chat allowed us to exchange information with anyone, either individually or in a group. If we want to exchange information about a certain subject, the best way to do this was to seek a chat server with a special room for this particular subject. We can only talk only to the individuals who are currently logged in. How can we access messages and files left by others? For this and for other facilities we must create a Discussion Forum and a Discussion Board (this can be shortened to a Forum). **Discussion Forum is a facility whereby we can contact someone, leave messages, ask questions and read the latest news from a domain.**

13.3.2. *What can we do on a Discussion Forum?*

The messages you send remain on the Discussion Forum server and can be read (similar to an e-mail) by the others who enter the Discussion Forum. The message may contain a new subject which you want to introduce or it may be comment on someone else's message. This reply message is called a "thread". Do not make confusion this with chat where **we send a message and wait for an immediate answer. Using Discussion Forum we can send a message and get an answer at a later date.**

The advantage of Discussion Forum is that the message can be read by anyone, even if that person wasn't connected when you sent the message, and reply can be read by anyone at any time. Once you have placed a question, someone replying has the time to research the subject. With chat you must give an immediate response otherwise it will be "drowned" out in the mass of messages that were sent in the mean time.

13.3.3. *How are messages administrated?*

A chat server memorizes the last messages displayed to the participants depending on how the server is configured). There is a danger of server saturation as a result of messages left by individuals on the Discussion Forum server. To avoid this, **messages are erased automatically (or archived)** to make space for other messages and reply's. The record of initial messages and reply's are accounted for

and displayed in a shape of a tree structure. The messages that open a new subject are displayed at the top of tree structure, and the replies below. We can search for a message with a **key word or key phrase**.

13.3.4. *Sending a message*

To add a new message, we have to press the "Post New Message" icon on the DF graphic interface (this may be called something else e.g. "Post New Topic"). A window will be displayed in which you must input your address, the message content, and then press the "Post Message" icon.

If we want to read a message we have to click on its name from the tree structure. If we want to reply, we have to press the "Reply" icon. In this case, a window will be displayed in which we can write a message and then press "Post". There is also an "Email to Poster" option which will display a window where a message can be written which will be sent as an e-mail to the sender of the first message. By sending an e-mail confidentiality is ensured as the text is seen only by the addressee. However it is important to remember that people are not always pleased to be disturbed on their own e-mail server.

13.3.5. *Navigating between messages*

In addition to the search for key words/phrases option, other facilities exist to manage messages:

- A message can be deleted from the list by clicking on the "Delete" icon;
- A previous message can be read by clicking on the "Previous Message" icons;
- A new message can be read by clicking on the "Next Message" icons;
- messages can be arranged temporary by the sender. It is important to note that the tree structure will remain but the messages from the same level are re-organized;

Some Discussion Forum are organized into categories. Each category contains personal thread messages.

13.3.6. *Other facilities to ease your work*

There are other options to ease the message administration on some servers. Messages which haven't been read are shaded grey or may have a "New" icon to the right of the name. Unread messages only may be viewed by clicking the "View Unread Messages" icon. By clicking again all the messages may be viewed.

Messages which start a conversation (thread messages) have an + icon to the left. If you click on this icon it turns into – and you can see only the thread message. Clicking the icon again, it turns into + and you can see the whole tree structure, generated by the discussion on that message. There is no +/- icon at some servers and clicking on the thread message opens and closes the tree structure.

You can click a "Collapse All" icon in order to see thread messages only. (this is the same as clicking on – for all thread messages). You can also click on the "Expand All" icon in order to see the tree structure associated to all thread messages (this is the same as clicking on + for all thread messages).

13.3.7. *Restrictions on Discussion Forums servers*

Some Discussion Forum servers require some restrictions, to avoid the system overloading, to eliminate advertising and to maintain decency standards. This may take the form of a server superintendent who reads the messages and identifies

those which are not suitable. These are known as "**moderated**" systems. In that case he can send a warning and ban access for the user in question. Discussion Forums without restrictions are also called "**unmoderated**". There is also an intermediate category called "**semi-moderated**", in which the superintendent cannot eliminate a message, but he can delete it before it is displaying. Other restriction type concern the auto deletion of old messages.

13.3.8. *Access to Discussion Forum*

The access to a Discussion Forum server can be free (anonymous type) or restricted using a password and a user name. To have access you have to contact the DF superintendent (by e-mail, using a icon on the DF Web page), to give personal details and to suggest a name and an access password. Professional associations, clubs, and different type of associations create many servers. People who applied in these associations get access on DF, with a name and a password. You may have the surprise of asking you to pay for having DF access. At the same time, some DF that give also the possibility to attach/send images and even movies, can ask for installing in your computer certain programs when accessing, or they can start automatically such an installing!!! Be careful before clicking OK!!

13.3.9. *Other facilities on Discussion Forum*

Discussion Forum offers more than a method to organize a message inbox. It can also offer an on-line diary that can be send as an e-mail to all registered users. This can be used to inform of articles on Web and new biographical information (books, journals, articles, video). There are general Discussion Forum such as Yahoo, in which many discussion categories and subcategories exist (e.g.: tourism/Asia/Thailand). These servers may use other Discussion Forum servers so as not to created a new category but rather to act as an address for directing the user.

Some Discussion Forum servers allow you to score to the existent messages (for example the answer to the question; What is your opinion about the X movie?). Other Discussion Forum users cannot send other reply messages but only to read the existent ones and score them. The server displays the existing scores for every message.

13.3.10. *Other organization facilities*

Some other features include:

- An individual does not have the right to modify thread message or other message content, even when you have sent them;
- if you want to add something to an existing message you have to send a reply to that message;
- if there are a lot of messages, they are organized in pages; To view other messages click on the "Page Up" and "Page Down" icons or on icons with associated arrows;
- A user can be notified by e-mail if new messages on a certain thread have been sent or on the entire forum; some servers offer a mailing list to which you can apply whereby e-mails are sent to all the addresses from the list automatically ;

For every message the subject, the sender's name and the setting up date are displayed. When a user writes a reply message, the subject of the message being replied to is written automatically in the "subject" window of the message. It may be useful to modify this text, in order to make it more suggestive.

13.4. Teleconferencing on the Internet

*Conferences between distant points represents is a time consuming and expensive business **Teleconferencing covers everything that means audio and/or video distant communication between a number of participants**. It can range from a simple short distant audio application to the complex applications of simultaneous movie transmission between points at thousands of miles. We have seen the development of complex and increasingly in-expensive hardware and software solution to teleconferencing from specialised equipment designed for use in a localised area to Internet solutions. The chapter takes a look at this domain and the introduction of the existent sub domains.*

13.4.1. Teleconferencing utility

Man has wanted the ability to communicate freely with a group of individuals and be able to transmit complex information similar to what can be achieved in a conference or at a round table. Telecommunication solutions developed in trade and long distant business environment have become a deciding factor in the business success of business. As these solutions have developed prices have decreased and non-business applications have begun to appear such as public administration, Tele-education, entertainment and home conferencing. Distant Tele-education is growing in importance and provides a low-cost solution.

13.4.2. Teleconferencing solutions

A chat business application with sophisticated coding and decoding solutions can be used to insure a information protection. Written information doesn't allow the sending of a large amount of information because of the time it takes to write. Larger quantities of information can be achieved by using audio information (talking) and graphic information (image, movie) solutions. Specialized hardware are of less importance with chat and Forum Discussions, using the general Internet infrastructure. In teleconferencing it is necessary to have supplementary equipment (analogical and digital video cameras, microphones and loud speakers) and it is also necessary to have high quality PCs (good resolutions monitors and high quality video cards, sound cards). Because it is needed to sent a large amounts of information very high quality Internet communication lines are necessary.

13.4.3. Analogical vs. digital

There are two **ways main teleconferencing methods: analogical and digital**. The analogical solution, which is based on the transmission of an electric tension signal, that comes from an analogical or digital video camera, has the advantage of easy configuration and doesn't depend on the Internet or any other calculation equipment. The analogical transmission is instantaneous and insures high quality since this technology has been in existence for some time. Its main disadvantage is the impossibility of long-distance connection (it is expensive, taxes are prohibitive and there are problems concerning the attenuation and the fluctuation of the sound). It is suitable for applications inside a building, with a small number of participants, and where high performance is necessary. The digital solution is based on the numerical conversion of the signal from a video camera is and is less expensive means of conventional calculation (PC-s, calculation stations). The transmission of numerical data infrastructure may be specialised or the Internet may be used which decreases taxes significantly however, there can be delays in data transmission or interruptions.

13.4.4. *Hardware equipment for audio analogical and digital teleconferencing*

There is a huge variety of hardware equipments for audio analogical teleconferencing including microphones, loud speakers and analogical signals multiplexing equipment for audio analogical teleconferencing. This multiplex sends the signal from a microphone to the loud speakers. Where distances are great supplementary amplification is required. Multiplexing occurs through manual command (icon). Existent professional systems have a microphone, a loudspeaker and an icon for making a call all integrated into one unit. When choosing such a system it is necessary to measure the performances of the microphone, loudspeaker, amplification and multiplexing. Usually the Internet is used as a mean of transmitting information for audio digital teleconferencing. There are two approaches:

- the use of PC-s with audio cards and microphones;
- the use of a microphone network plugged to special analogical-digital converter which transforms the analogical signal into a digital signal creating a compressed data package. This equipment has a personal calculation system and it can be connected to the Internet.

13.4.5. *Hardware parameters for audio analogical teleconferencing*

The microphone: frequency (minimum 10Hz-16kHz,) the superior frequency up to 20-25kHz), sensibility (which allows larger distances between the speaker and the equipment to have a strong enough signal, avoiding the use of amplification), better directionality (the microphone must be responsive to the acoustical wave that comes towards it and less responsive to the wave that comes laterally; This is essential if there are many speakers in the room;

The loud speaker: power (to permit putting it at a great distance from the audience); frequency domain (same as the loud speaker); lining (the characteristic uniformity depending on the frequency to avoid signal deviations); directionality (to avoid disturbing others in the room and diminish background noise created by reflections of indirect emitted waves on the object around the audience);

Amplification: amplification; the domain of frequencies and lining the characteristic in frequency;

Multiplexing: number of input channels; the domain of frequencies and lining the characteristic in frequency; eventual amplification.

13.4.6. *Hardware for audio – video analogical teleconferencing*

In order to transmit the image simultaneously with the sound It is necessary for every participant to have an analogical video camera, usually directed towards them. The signals from this camera are transmitted to multiplexing, with a more complex structure and then directed to the monitors in front of the participants. As previously, the existent professional systems have the microphone, the loud speaker, the video camera the monitor and the icon for requesting a call, integrated. When choosing such a system, it is necessary to envisage the various performances:

the audio sub system performance

the video sub system performance:

the video camera resolution (usually in number of lines/mm, light sensitivity, the support mobility that allows correct orientation)

the monitor resolution (usually in number of lines/mm, contrast, brightness).

13.4.7. *Hardware equipment for video digital teleconferencing*

As in the case of audio conferencing there are two main approaches:

- the use of PC equipment with audio cards + microphones and system of image acquisition: for image acquisition it can use an external analogical camera from the PC, in which a special card for analogical video signal is assembled for the conversion into numerical signal, or it can use a camera which is included in the analogical - digital conversion, so that it can be directly connected to one of the ports (RS-232, parallel, USB) of the computer; this external camera is also known as a Web-cam;
- the use of a microphone system network + analogical video camera plugged into a special analogical - digital converter which turns the analogical signal into a digital signal. Eventually this creates compressed packages. This equipment has a personal calculation system, and can be connected to Internet.

Because of the miniaturization of the components and of the use of liquid crystals displays, it is possible to integrate all of the equipment as a **video telephone IP** (connectable to the Internet).

13.4.8. *How audio teleconferencing without a special structure can be achieved*

There are many firms which have an analogical audio conference without having all the necessary equipment. This is usually achieved in two ways.

The individual registers with the other participants of the conference and gets a phone number and a pin code. There are many types of codes, the simplest being the moderator code and a waiting code;

when you are ready for teleconferencing, all the participants call the phone number and enter the pin code when automatically asked for it and the conference begins.

Some firms have the assistance of an operator in order to contact the participants at a specified hour.

13.4.9. *Digital telephony*

There is a misunderstanding that other surfaces when we talk about digital telephony. The telephones send analogical signals (electric tension variations) to a telephone exchange that diverts them by using switch networks in analogical telephony. In digital telephony, the telephones send the same signal to the telephone exchange, but it diverts them into a numerical signal, which is sent to calculation equipment which analyses it, processes it and diverts it to another telephone exchange. The signal is turned into a tension signal and it is sent to the addressees telephone exchange (or to the addressees calculation equipment + the associated digital telephone exchange).

In digital telephony the audio signal is converted into a digital signal a further into data packages which are sent directly to a central server. It is a network between telephones (which act as special mini computers) and a server. The most modern alternative, which eliminates network taxes (by cable), is where the phones connect directly to the Internet, known as **VoIP (Voice Over IP)**.

13.4.10. *Application sharing*

A **service** teleconferencing firm offers is **application sharing** which uses Internet facilities. Application sharing permits a host to offer the control of the computer to a person and to let that participant control his computer. Control may be offered to other participants and may be viewed by all participants. Application sharing is useful for:

- interactive collaboration;
- interactive demo and the software product training;

- offering distance software technical support for a participant 's PC;
- 20 participants are recommended;

13.4.11. *How video teleconferencing without a special structure is realized*

Unlike analogical telephony where global networks already exist there are no image analogical transmission networks. Implicitly, **video conferencing without a special structure implies the existence of a connection to a data network**. For example, the digital network of a company, or more generally, the Internet. A telephone connection to the Internet is necessary. All the participants have to call the same telephone number, and, after introducing the password the mixing of audio signals is possible so that everyone can hear everybody else and video signals from the participants' telephones cameras are transmitted. Every user will see the videophone display distributed in windows, each window displaying the image from one of the participants. There is also a mixing system connected to the Internet. Advantages include high system fidelity. The number of participants at a video conference can vary at any given time.

13.4.12. *Internet video-conferencing*

Another solution offered by firms specialized in teleconferencing services is **Internet video-conferencing**- the following conditions are necessary:

every participant owns a PC and adequate hardware equipment (CCD camera, microphone, loud speaker, performance sound and video card);

the users installs software to connect to the server administrated by the service provider by Internet;

after connection audio and video data from every participant are transmitted to the server, mixing (digitally, by data processing) and transmitting them to every participant;

the participants can hear the mixed signal and see a number of windows on the monitor, each window containing an image from one of the participants;

some services provide the possibility of transmitting from a participant's PC both the image and the sound and the document selected by him; the document is transmitted to everyone, so that they can see the number of windows with the participants on the monitor and on the other computer the document they discuss, if they have double output video card.

The performance of a video conferencing system depends on the servers capacity to mix the signals of many users, to permit image/sound, to document duality and to permit the connection of the signals from different video conferencing hardware systems, data security, data protection and maintain its functioning if necessary.

13.5. **Teleconferencing hardware**

*In the case of chat or DF you need a computer which is connected to the Internet and in which a browser is installed, and a supplementary program(downloadable for free on Internet). **In the case of teleconferencing supplementary hardware equipment is necessary.** These may vary from a microphone, a loud speaker and a CCD camera connected to the computer, which in turn must have an adequate sound and video card, up to specialised, sophisticated equipment. Additionally the installation of supplementary programs may be necessary. The aim of this chapter is to have a glance at this universal and specialised equipment.*

13.5.1. *Web camera*

The image shown to the other participants depends on the camera used and on the video card. To obtain the image you can use a simple **Web camera**, designed to remain close to the camera and record the surroundings or a more sophisticated camera can be connected. The essential features for web camera are: sensor type: CMOS or CCD; photo resolution; video resolution; connection ;memory; good focus; it may be manual or automatic; zoom:(some cameras have digital zoom) achieved by image processing; additional software for image processing.

Some photo digital cameras, with memory and the ability to transmit data to a computer can be used for teleconferencing if it can be used as a web camera. In this case, the camera records the image not only through manual command but also automatically, sending the data to the PC.

13.5.2. *Web camera resolution*

Photo resolution: the image is made up of colored pixels; the more pixels you have on a surface the clearer the image. The quality of the image can be increased on some cameras by getting more successive images and processing them automatically on the PC (this is done automatically by the camera driver); it is useful to know the sensor resolution and the improving resolution (by interpolating); common pixels values include: 320x240 640x480, 1280x960 and 1024x768 (from sensor structure or by interpolating), 2048x1536 (usually by interpolating) .

Video resolution: There are two main concepts- the video and the photo resolution; the photo resolution is made by a sensor and eventually by image improving techniques; the video resolution depends on the sensor capacity to record images fast and is indicated by the number of images (frames) that can be read; the resolution can be regulated in some cameras by using a lower resolution to record many image in one second (for example 352 x 288 resolution with 30 frame/s or 640 x 480 with 15 frame/s at Logitech QuickCam Express).

13.5.3. *More about Web cameras*

Connection: some cameras process the signal inside and then send it to the PC by USB bus (the majority of web cameras); others send an analogical signal and they need to be connected to a video card;

Memory: some cameras have an internal memory which permits their use as photo cameras or for slow recordings; the usual values are 2MB but they can also be 8MB, 16MB.

Other solutions include the use of a performance digital photo camera, with video signal or even audio – video signal output (if the camera has an attached microphone, too). In this case you need a video card with a video signal input.

13.5.4. *How can we hear others*

If you have ever thought about using computer loud speaker in order to hear others forget about it !! You need to have speakers! The main parameters that define the speakers are power, the number of speakers, the frequency domain: the human ear can hear 16/20Hz - max 20kHz, implicitly the speakers should cover this domain; the inferior frequency in simple systems is 50-70Hz, down to 25-35 Hz for the performance ones, and the maximum frequency is 18kHz. If you want to be the only one that can hear, connect some headphones at the speakers output or direct to the sound card headphones output.

13.5.5. *About headphones*

If you want mobility use wireless headphones, to which a device that emits radio waves is connected to the above mentioned outputs and is received by the headphones. This headphones can be mono (eventually having a mini microphone)

but should preferably be stereo. It is best if the volume control is directly connected to the headphone, so the PC application does not have to be used while video conferencing. It is essential that the headphones have an answer frequency domain of 20Hz-20kHz. Note that a good frequency answer demands a large speaker, and the headphones may seem cumbersome. Special materials are used to decrease the weight and may be described as "Semi open structure stereo headphones and super thin diaphragm with neodymium magnet...."

13.5.6. *Choosing PC Speakers*

Speakers with power of 10-15W, active (with separate power supply and amplifier), stereo, for applications in which you are present at your PC is ample.; usually the power is divided equally between the two speakers; most of them have an on/off switch, a volume control switch (of amplification) and a headphone connector; if there performance is good enough they also have tone control; In high performance systems(movie quality) the sound/noise ex 90dB relation has to be indicated, Dolby Digital decoding for special effects and eventually a renown company certifying (e.g.: THX).

13.5.7. *Choosing speakers for a conference room*

To be heard in a conference room with many participants more powerful speakers are needed and, to have a constant sound quality in any corner of the room, you need a multi speaker system, usually with a big loud speaker for bass - low frequency, and a set of loud speakers (4-5) for medium and treble frequencies; the power may vary from 40 W (5x4W for 5 satellites + 20W for subwofer, the bass loud speaker) up to hundreds of watts for large rooms; audio card output lines are amplified and connected to the satellites and a subwoofer; you need to adjust the total amplification and for a high performance system, the amplification can be adjusted in each speaker.

13.5.8. *The microphone*

There are many options, from mini microphones, to those microphones with a capacitor. Important microphone parameters include :
Directionality; in order to be heard while moving you need an omni directional microphone; if, you don't sounds made by other colleagues or other static noise sources to be transmitted, then use a unidirectional microphone.
the frequency domain, at least 30Hz-16kHz;

13.5.9. *Video cards*

Video cards are important for two reasons:

- to show the participants' image for video conferencing; the frequency needed to refresh the image for video conferencing is much lower then in a movie;
- to achieve video analogical signal from a video camera.

Most of the motherboards have integrated video card facilities, which are cheaper, but they let you install a special video card in one of the PCI or AGP special slots. Superior performances are obtained using special video cards.

Important specifications for video cards include the size and type of memory, the frequency of the video processor, outputs, inputs, communication bus (older cards used an PCI bus, and now the AGP bus is used almost exclusively; Many alternatives are available, depending on speed from 2x, 4x to 8x; It must be noted

that to use a 8x AGP video card it the computer motherboard must be able to handle the same speed).

13.5.10. *Video camera specifications*

Memory dimension, type and frequency: frequently video cards come with memory of 64MB and 128MB; The type of memory dictates the access time, current models include DDR (4 ns), DDRAM, SDRAM (7,5ns). The frequency dictates the data access speed, typical values are 166 MHz, 333MHz up to 800MHz. The video processor frequency is usually between 250MHz and 450MHz.

TV-out S-video output, respectively a TV output similar to an ordinary VCR, without modulation and a dual display output which allows you to connect two monitors to the same computer, allowing teleconferencing with participants introduction on one monitor and a discussion document on the other one. Video (S-video) input is for connecting to an analogical input card.

13.5.11. *Audio card*

An audio card ensures that the microphone signal is connected to the speaker's command. The majority of motherboards also have integrated audio circuits. It is necessary to install an internal supplementary card, – on the PCI slot – or externally –to the USB for superior performance.

Important specifications include:

the number of data processing bits which also indicate the audio data processing precision; commonly 32 bits are used;

the number of analogical digital converter (DAC) which influences the playing fidelity (on condition of at least 24 bits); of performance systems 24 bits;

decoding Dolby Digital, that will insure a superior quality treble frequency components; the decoding is assured by the audio card processor (software) and also by specialized circuits;

signal/noise relation;

Type and number of outputs; usually 2 channels and up to 6 channels; analogical/optical/digital input; analogical, optical, digital output.

Number of channels (voices); it is important if you want to play a multiply combination of sounds, for example the audio application sound and the conference conversation.