SISU

PUBLIKATION 95:15

RAPPORT – SEPTEMBER 1995

Does Technology Help Organizations to Listen?

Building Foundation for Receptive Communication in Organizations by Means of Technology

Klara Pihlajamäki

SVENSKA INSTITUTET FÖR SYSTEMUTVECKLING

SISU

Preface

Systemdevelopment has been focused on technological functions and connections ignoring an increasingly complex aspect of human communication.It has dealt predominantly with the issue how to transfer information from the machine to the human and the other way round. This issue has gained attention before the issue how information is transformed from human to human in communication. Man-machine interaction has traditionally dealt with structural and functional aspetcs of the man/machine interface. It has not included communication, emotions and organizational aspects.

By now, the approach in systemdevelopment in organizations has been how to construct and design the architecture. Recently, the attention has been focused on the design of processes. The important question is , nor matter if it is a question of architecture or processes, which kind of information the technology is supposed to work and mediate. This is the question of information quality. Another important question, especially in organizations, is how to share corporate information. How to share information is a question of how to communicate. How to share (use) technology is dependent upon how people communicate.

Attention in systemdevelopment has been on how technology affects communication. However, the historically and theoretically significant phenomenon is not the effects of the mediatechnology on communication, but that of the effects on technology of the use to which it is put by people.

Technology extends human cognition, sensory and motor capability. But systems designers have often neglected to refer back to the human capability when extending the technological capacity. Therefore, the usability problems have arisen.The technological capacity "exceeds" communication capability. Williams (1988) states that "by means of modern information and communication technologies we have expanded enourmously our communication possibilities. Now we have to expand our communication capabilities to manage the quality of this communication revolution." To take advantage of the technological potential, the human communication must also be developed. Which kind of communication capability can be developed further so that the technological capacity could be managed and utilized more effectively?

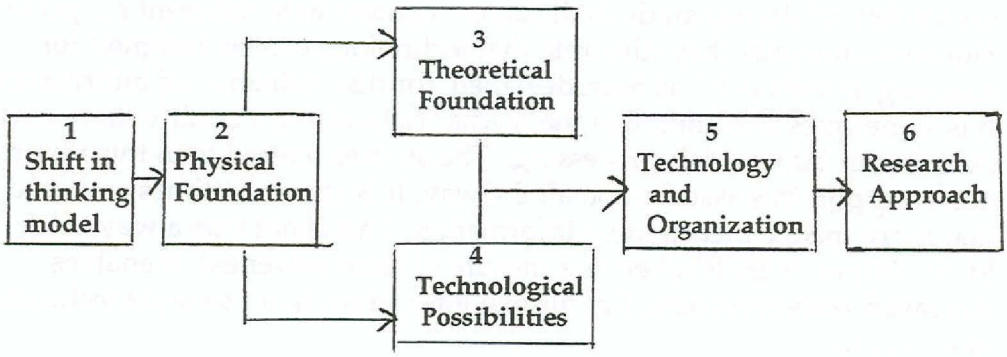
The most underdeveloped communication ability today is receptivity generally and listening specifically. The purpose of this report is to outline a research approach to how technology can be integrated with the receptive communication in organizations. For this, today's dominant model of communication will be "reversed".

Content

Summary

To take advantage of the technological potential, the human communication must be developed. The dominating communication model today emphasizes the source and dissemination of information. The neglected aspect of human communication is receptivity and listening.

The present process approaches in systemdevelopment means that processes are made more effective to increase the productivity and efficiency. Moments that don't add to the (customer) value are eliminated. How about identifying and evaluating communication processes in order to eliminate everything that doesn't add "value" to communication, that doesn't add meaning and lead to adequate, timely respons? How can technology improve receptive communication? How to design technologcal systems based on receptivity instead of dissemination of information?
The purpose of the report is to design a theoretical frame of reference that can be used in research exploring the technological development in organizations in relation to the development of receptive communication.
The outline of the report is following:



The Outline of the Report

To shift from the traditional ,mechanical model to receptive communication model is a "paradigm" change. However, such a shift is necessary in order to handle the ever increasing amout of information and complexity. The shift is from sender orientation to receiver orientation. Receptive communication is an internal process and cannot be observed directly. Today, it is an unconscious process for most of us.

To understand the problems of receptivity it is essential to know something about its physical reality. The following section (box no 2) describes shortly that reality.Neurophysiological processes, brain rhythms, etc., influence psychophysiological and psychological functioning, such as perceptions, attention, expectations, etc., all of which are essential components in receptive communication.

Most theories and models are built on the sender paradigm . It is difficult to find any comprehensive theories about receptive communication that would be easily applicable in the organizational context (box no 3) . Receptivity in this report refers to listening, which during the last 15 years has advanced rapidly theoretically, but above all methodologically. Therefore, it can be used as a frame of reference . The basic stages of listening proces are attention (reception), interpretation (understanding), evaluation and response.

To describe organizational communication in terms of listening is not easy, because the traditional thinking model must be turned "upside down". Organizational learning theory and a model for organizational collaboration are useful starting points to conceptualize organizational listening.

S ome technological studies and research results are classified and evaluated using the theory of listening process as a frame of reference(box no 4). Most of the media studies today are so called impact-studies based on the traditional model of dissemination. It is difficult to draw any general conclusions concerning the technology's contribution to listening based on the variety of studies made in didderent context with different purposes. However, together they illustrate that technology can be designed for listening as well as it has been designed for dissemination of information. It is sometimes assumed that the media "richness" is a quality that increases meaning in information processing.. The studies refered to in this report don't support this assumption all the way. It is also sometimes assumed that more media means more information. This is not true always. Media interactivity is taken as a mesure of responsiveness. It enables increased responsiveness, but human interaction is not same as technical interaction.

Box no 5 integrates technology and organization from the receptivity point of view. A new organizational model that integrates both technological and communicative collaboration is discussed. Effectiveness is dependent on how well communication and technology are integrared in organizational relationships. Because one of the most difficult listening situations in organizations is the meeting between compelementary coding systems, it is suggested that such situations are paid a special attention.

The suggested research approach (box no 6) integrates the basic ideas of this report.

1. Introduction

a) Technology Points to "New" Communication Capabilities

Technological systems facilitate mental mobility, enhance statistical analyses and editing of reports, amplify generation of information, provides access to information without regard to time and place, etc. The more users / people are interwoven the more priorities, interests and ideas will be presented simultaneously and the more information is combined with decisions. Because more information is accessible, there will be a greater need in the synthesis of information.

When amount of information increases , one must learn to interpret information and to perceive how it has been changed because of the basic hypotheses in the software program or because of the dynamics of the social situation. This requires insights about the dynamics of the context of the information.

Individuals and groups must not only handle (receive, evaluate and respond to) a big amount of information, they must also do it at accelerating speed. Written, even spoken, information may appear too slow. Pictures, images and patterns can handle more information at once. Pattern recognition and image management have already become important organizational skills of communication. At the increasing speed, to be able to detect and identify a change, we must become active receptors of patterns and continuity instead of senders who try to map the movements of the separate dots. The technological development encourages more total involvement of the human with the mediatechnology by stimulating simultaneously several senses in a variety of ways.

Hardware becomes physically minor while software grows more in power. The user gets more possibilities to orchestra his/her own reality. The limit of the technology becomes the limit of human imagination and innovativeness. Technology runs in cooperation with the minds of those who create it by using it. Consequently, technology neither works effectively nor develops appropriately without integrated and innovative thoughts of the users. Succesful technological adoption requires innovative responses on the part of the users.

When complexity increases, when physical distance plays a minor role in information transmission and when more people get involved in the network, ability to select, digest information and to respond appropriately become important communicative competencies.

b) Ignored Communication Capability

Communication is still often thought of as simply a matter of sending messages between people. Some writers have started to question this thinking model of communication . Frank (1), for example, states that human communication is an attempt primarily to evoke responses instead of just transmitting information and sending messages. What is communicated is governed as much by the recipient as by the sender. Also Gerbner, Gross and Melody (1973) point out that the basic communication skill is that of receiving and comprehending an organized symbolic message.

Goldhaber et al (1979) underline that the first step an organization must take in gaining control of its information environment is to concentrate on the information recipient, not on the information itself or the technology. They point out that it is always the receiver who can tell how the message is interpreted, if the right channel was used or if the message was framed "correctly". They also state that receptivity and responsiveness play key roles in timeliness of organizational activities.

Receptivity has long been an ignored aspect of communication research. The receptive communication research got off late in the 1970s-early, in the 1980s. At that point of time the interpretational approach gained legitimacy in the literature of organizational communication. Also as a methodology, the interpretative approach was legitimized at that time. Uses and Gratifications studies , that actually started already in the 1960s in mass communications, represented a major shift from the concept of passive to active media audience. In 1980 a group of scholars published the first volume of their work in Neuro-Linguistical Programming, stating that people receive linguistic cues (words) from others which reflect their own preference of information processing.

"Openess" in communications became a concept that laid the foundation for further development of receptive approach. Technologically, the 1990s is described as a decade of "open systems". However, openess as a quality is still more often attached to the sender/source rather than to the receiver.

There are many misconceptions about receptive communication. Bostrom (1990:1) points out that to assume that messages are received, processed and retained in approximately the same way as the sender intended is unwarranted. Even very simple messages are easily distorted. Meaning is not transmitted. It is evoked in the mind of the receiver. The meaning received is not necessarily the one in the mind of the source. If it could be certain that the source's exact meaning always would be evoked in the mind of the receiver, there would be no need for books, courses and teachers in communication.

Considering the amount of books and different courses in communication *per se*, the need (to reach the receiver) seems to be tremendous. How would the world look like if we conceptualize it from the receptive point of view? While it is acknowledged that sending messages must be adjusted to the situation, receptivity is still supposed to be an universal phenomenon. There is a misconception that receiving behavior is basicly the same regardless of differing situations and messages. However, individuals and organizations vary widely in their ability to receive and digest information. The causes of this variation are poorly understood today.

c) The Purpose and Outline of the Report

Integration of organizational receptive communication with the technological development is motivated today by several reasons, for example:
* to decrease the usability problems of technology
* to diminish the gap between technological potentiality (what could be done) and communication actuality (how we actually communicate)
* to facilitate technological and organizational change processes
* to diminish the problems of information overload in organizations

The questions this report looks answers for are:
* what do we know today about receptive communication factually and theoretically?
* how to evaluate technology vis a vis this type of communication?
* what to take into account when planning empirical research in organizations?

The overall purpose of this report is to suggest a research approach to the problem of how receptive communication can be improved by means of technology in organizations. This purpose is approached in three steps:
1. Conceptualization of the receptive communication
2. Description of technological studies based on this conceptualization
3. Applying the concept of receptive communication and its "technological extension" to the organizational communication

This report is grounded on three until very recently separate research areas; technology, organizational communication and receptive communication (internal information processing)

The content of the report is outlined in the following way:
1.
Defining Receptive
Approach

A shift in the model of thinking: from a mechanic to an organic model

2.
Physical Foundation

Limited awareness in perceptions. How do our senses, nervous system and brain handle information. What are the physical limits of receptivity

3.
Theoretical Foundation

Listening - an advanced theory in receptive communication. How can listening applies to organizations. Organizational listening is organizational learning

4.
Technological Approach

Research in media technology versus listening process. How does technology affect listening in general

5.
Organizational Approach

Technology and Organizations. Collaboration - as a modell for integration between technology , organizational communication and receptivity (internal information processing)

6.
Research Approach

Suggestions to how approach the empirical field.

2. From Mechanic to Organic Model

Receptivity is a different way to look at communication. The difference is illustrated here by means of two models, the mechanical and the organic model. The mechanical model has been the dominant thinking model for a long time. The latter is a suggestion for a "new" receptive view of communication.

a) The Mechanic Model

The technological systemdevelopment as well as the communicative training and thinking has long been based on the Shannon-Weaver model from 1949. This model has sender / source orientation. The destination (receiver) is not specified in the model other than as the reciprocial of the source. The sender is supposed to make the choices. The concept of information is seen as the property of the source/ sender. The receiver is considered either as the "dependent" variable and the sender as the "independent" variable or they are considered as black boxes linked by a channel.

According to Shannon-Weavers communication theory a message can be sent from one place to another, as long as it is coded in a proper way. The limits are defined by the capacity of the channel.Shannon-Weaver's information theory is primarily an engineering principle that doesn't concern very much the semantic aspects of information, i.e. its meaning. The scope of this information theory is restricted to the transmission of messages distinct from any interpretation. It doesn't deal with information capacity, i.e. the extent to which we receive, interpret and respond. It is hardware based and doesn't include the interpretation of symbols. It assumes a non-ambiguous, context-free communication.

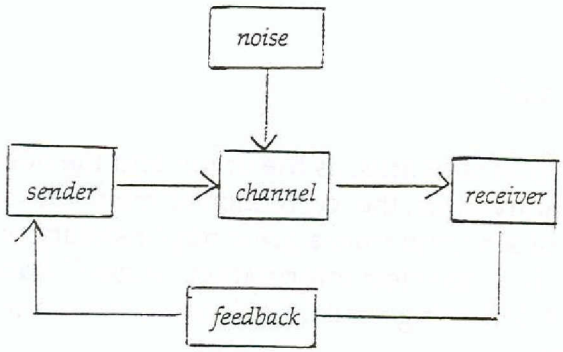


Fig 1. The Traditional Communication Model

The meaning transmitted is assumed to be equal to the meaning conveyed, i.e. it assumes transparancy in communication. If this is not the case, the fault is thought to be either the sender's who was not clear enough or the receiver's who was not attentive enough or because of some "noise". Implicitly this means that the intentions of the sender can be coded into an explicit message.

According to this model, receiving information is equated with a change . A person is said to have received information when he/she after reception knows something he/she didn't know before. Change in this model means a conditional readiness to react differently. It is conditional, because it is dependent on external stimuli in a context (also often defined externally)and because it is re-active, refering to the past.

Communication, according to this model, is equated with sending messages, the reception of which is uncertain. The purpose is to reduce uncertainty as much as possible. The process of communication is perceived as uncertain as a roulette wheel, a presidential election or a stock market, being basicly perceived as a random process. It is as if this perception had created its own reality; information effectiveness is low, in average 25% (Nichols and Stevens 1957, Goldhaber 1983) measured in terms of reception (and memorizing).

Receptivity defines the effectivenss of communication. Rosenblatt, Cheatham and Watt (1977:12-13) state, for example, that a typical executive can receive and absorb only 1/1000 to 1/100 of the available information relevant to decision making and the average American family of four is exposed to an average of 1500 advertising messages every day, but less than 5 percent are actually received.

Wolvin and Coackley (1992:419) refer to a study of Jacoby (a consumer psychologist) who asked 2700 television viewers about televised segments that were shown. More than 90% of the viewers misunderstood some part of what they saw.

b) The Organic Model

In complex information networks, as the origin and the destination of messages remain anonymous, the correction of mistakes via feedback becomes difficult. This kind of situation puts a great responsibility on the recipient. He/she must know how to select information, "digest" it and how to give an adequate respons. A following model for "open" , continuously changing system is suggested.

In this model we don't necessarily know from where all the information comes and where it goes or how it is used. It symbolizes continuous learning , being open ended, non-deterministic. This model fits also to the idea presented by Campbell (1982) that evolution is primarily concerned with receiving and meaning, while Shannon-Weaver's information theory is concerned with the source and production.

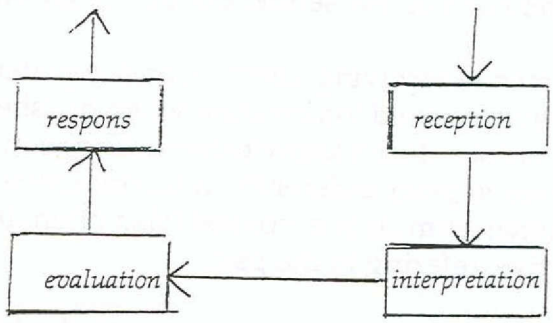


Fig. 2 The Receptive Communication Model

Instead of thinking of information as something present in the source (producer/sender) from which it is transmitted to a destination (receiver) we must conceive of it as something needed by an active agent, who seeks it out in a source depending on his/her purpose and attention.

How much information there is in the source depends on the capacity of the seeker to find it , i.e. to recognize and pay attention to. The information is not just dependent on how much of it was "stored" in the source. The capacity of the receiver /seeker/user determines the amount of information found. The model presupposes internal information processing controlled by the receiver.

In this model the sender becomes a kind of "displayer". The messages of the sender dicloses how he/she views him/herself in affiliation of others, rather than in a relationship to defined receivers. For the receiver, the displayer becomes a part of the message. An embryo to this is seen in the fact that in computer communication the program is made by a person who is neither sender nor receiver. The program itself is a "message" (including the programmer). Computer provides a communication device, by which a person can receive a message quite different from what any human sent.

The receiver becomes a "messenger". A messenger is not the source of the message, but just "delivers" it further. When the messenger leaves the message (the response) he/she simultaneously confirms that he/she has received it. The respons confirms the reception. The messenger doesn't receive the message to hold it for him/herself. An inner change (acquisition of information) without ade quate and timely respons becomes like held energy leading to blockages in communication.

There is a difference between response and reaction on the "giving"-side of this model.According to Newton's law of movement, every action leads to re-action. Reaction refers to the past. Respons is not a reaction. It is internally initiated and refers to the present and thereby also to the future. It initiates further communication instead of merely supplying feedback. The quality of respons depends upon responsiveness which can be defined as a positive mental attitude toward others, including willingness and ability to listen actively.

The process model continues infinitively, a response leads to new reception and, ideally, forms an expanding and progressive curve. This is a communication model that supports increasingly complex organic structures. It symbolizes a movement ahead; what is communicated now affects the future communication. The model can be developed to the model that resembles Dance's (1965) spiral model of communication.

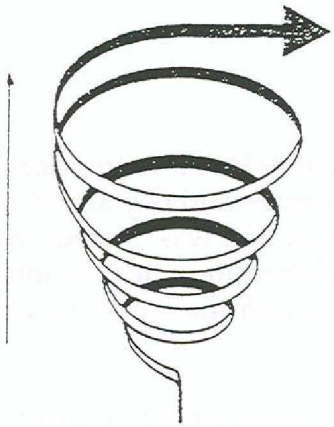


*Fig. 3 Dance*s Spiral Model (Source: Dance 1967)*

Dance's helical model of communication is the first model that expresses the interactive (circular, progressive) nature of human communication. The spiral is expanding, which means there is growth and learning. The model integrates the sender and the receiver; informing and being informed constitutes one branch.

c) Defining the Receptive Approach

For instructional reasons it may be motivated to contrast the "sending" perspective with the "receiving" perspective. However, receptive communication is not just an "opposite" to articulation, it is the precondition of it.

Sender/Source Orientation	*Receiver Orientation*
* purpose, goal intention	*focus (by self-determination)
* signification (denotation)	* meaning (connotation)
* content	* relationship
* text	* context
*deduction	* synthetic
* transportation of data	* transformation of information
* sequencies	* simultaneity
* reaction	* respons (based on free choice)
* exhange value	* user value
* thought (logos)	* beliefs (ethos)
* objectivity (external reality)	* subjective (internal)
* earn (reward)	* receive (gift)
* transaction	* interaction
* opposition and identity	* difference and similariry

* feedback (experiences)	* feedforward (expectations)
* encoding	* decoding
* deduction	* induction

Receiver orientation looks for interaction, use, focus (instead of goals, expectations (instead of experiences), responses (instead of reactions) etc. In receptive communication focus is more crucial than stated goals and objectives. Development of receptive communication must be take into account the physical reality we live in and the physiological conditions we are dependent on. The following section describes that reality. It influences our mental/psychological receptive functions, such as attention, expectations, perceptions and responses.

3. The Physical Foundation - Receptivity and Awareness

a) Conscious Communication has a Limited Range

According to the traditional model the message is considered succesful if there is a change in the receiver; i.e. what the receiver knows (perceives) is changed. This modell is based on conscious information processing and communication. It doesn't deal with sub- or unconscious communication. However, the literature provides theories and evidence how we receive and process information mostly unconsciously or subconsciously. There is a substantial body of experimental data supporting the idea that subliminal perceptual processes operate in the visual area, but a relatively minor amount of information regarding other senses.

Clark (1990) refers to researchers who found that listeners were capable of receiving messages without being consciously aware of the signals. Individuals could make discriminatory findings even when they are not able to report the stimulus correctly.

The phenomenon of "subliminal perception" , as it has been called sometimes, has been studied already in the 1800s, according to Clark. He refers to some experiments, from that time, which tended to prove the presence within us of "secondary waking self" that perceives things which the "primary waking self" is unable to get at.

Cameron (2) states, based on his own studies, that we receive signals which we have not consciously perceived, but which nevertheless evoke a respons. He calls this "ultraconceptual communication". He states that it throws some light upon responses which otherwise are hard to understand, for example, the choice of partners. He recognized also that signals which could be detected and understood on a given day might not be understood on the subsequent day.

Wylie (3) , refering to cognitive research, states that an enormous portion of cognitive activity is noncounscious . She suggests that it could be 99%; we never know precisely how much is outsider awareness.Wylie writes that only a small part of human activity is concerned with cognitive (linguistic) messages and refers to Birdwhistel who speculates that this part occupies only 5 minutes out of every day in our lives. Birdwhistel exemplifies this by a 5 seconds conversation ("How are you today?" - "Fine, thank you") between two persons during which the human being can absorb so much information that he/she learns what their relationship is and what the future may hold for them. Solely the eye, with its 100 million rods and cones and its layers of neurons perform at least 10 billion calculations per second, according to Birdwhistel. This confirms what we already know from communication studies, that the first seconds are important for the "image" the receiver gets about the source/sender.

Also Condon (4) found, in his analysis, that interactive synchrony (entrainment) takes place within 1/24th and 1/48th of a second. He demonstrated that the listeners body frequency modulates at least within 50 milliseconds, to the incoming sound structure of the speaker's speech. Condon speculates, too, that maybe 95% of the reality for us is mythological. It behooves us, says Gondon, to begin to look at the universe itself and let it speak and talk. He suggests, in other words, that to learn to know the reality, it is better to start to listen (and let the world speak).

The well-known Johari Window is a demonstration of how nonconscious part works in communication between people. To improve communication, the conscious part of the "I" must be expanded. The following figure, a modification of Johari Window, illustrates this.

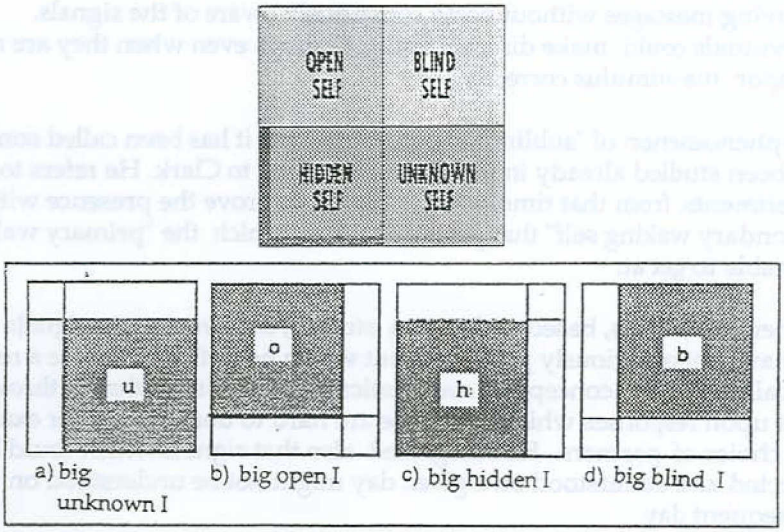


Fig. 4 The Johari Vindow

The window can help to realize how we view ourselves and how others view us. Knowledge of self derives from interaction of others. We learn to know others as well as ourselves in that interaction. The larger the open area of the window the better contact with the world, and the better receptivity.

Awareness is the "keyword" in receptive communication. It is not only a question of mental consciousness. The mental and the physiological are interwoven. Below I discuss some physiological/physical aspects of this awareness.

b) Electromagnetic Field and Brain Waves

Communication technology and human communication are based upon electromagnetic waves and principles, such as polarity and attraction. Attraction is magnetism that draws the polarities (differences) together. Polarity "separates", magnetism "unites". Attraction of polarities implies synergetic effects.

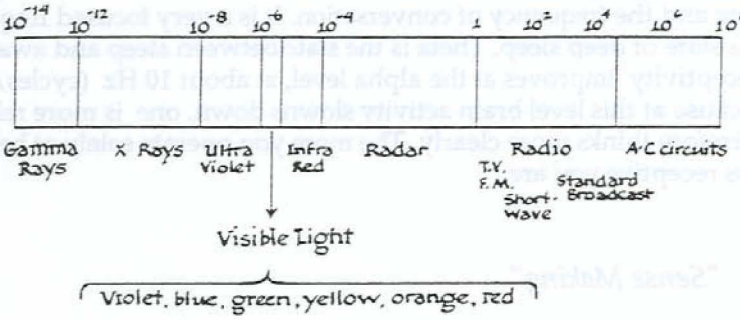


Fig. 5 The Electromagnetic Field Spectrum (Source: Bowler 1981:3, fig 1)

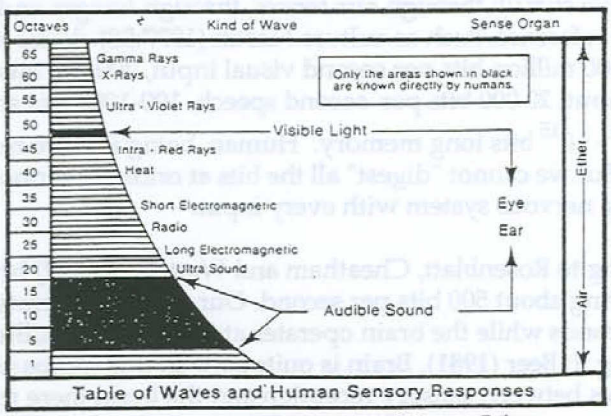


Fig . 6 The Electromagnetic Sensory Field of Human Being (Source: Pearson 1990:53 fig 17)

Electromagnetic field consists of energy waves or frequencies of light and sound. Each sensory organ responds to a particular type of stimulus over a limited range of energies in this field. Eyes, for example, respond to electromagnetic waves over an extremely narrow range of frequency compared to the wide range of electromagnetic radiations all around us. The sounds below 20 Hz (cycles /second) and above 20 000 Hz we cannot hear. Normal speech is in the range of 400 to 4000 Hz. The figure above shows our limited range of perceptions in the electromagnetic field.

The brain is composed of cells (neurons) which transmit electrochemical impulses. Each burst of electrochemical energy produces a corresponding electromagnetic field which can be measured.

Regular patterns of electromagnetic activity are called brain waves. We distinguish four types of brain waves: delta (1/2 - 4 cycles/second), theta (4-7 cycles/second), alpha (7-14 cycles/second), beta (14-21 cycles/second),.

Alpha is a state of daydreaming, doing any type of automatic activities, fantasizing, light meditation, etc. Beta is the state of normal daily awaken time and the frequency of conversation. It is a very focused frequency. Delta is a state of deep sleep. Theta is the state between sleep and awakeness. Receptivity improves at the alpha level, at about 10 Hz (cycles/second), because at this level brain activity slowns down, one is more relaxed and therefore thinks more clearly. The more you operate solely at beta level, the less receptive you are.

c) "Sense Making"

1. Selectivity

We receive stimuli through our senses, through images and through the frame of reference, such as culture.Martin (1977:58) claims that we can handle 100 million bits per second visual input, 200 000 bits per second sound input, 20 000 bits per second speech, 100-1000 bits short memory and 10^{13} - 10^{15} bits long memory. Human being is more receiver than sender. But we cannot "digest" all the bits at once.We cannot afford to excite the entire nervous system with every input.

According to Rosenblatt, Cheatham and Watt (1977:112) brain is capable of interpreting about 500 bits per second. Our neurons operate at the speed of microseconds while the brain operates at the speed of milliseconds, according to Beer (1981). Brain is quite slow in this comparison. With such disparities between sensory reception and the brain there must happen selection among the incoming stimuli.

The study of the relationship between stimuli and the subjective sensations they produce is the basis of psychophysics, so named by the pioneer in the field, G.T. Fechner. Fechner's Law says that as stimuli are increased by multiplication, sensations increase by addition, i.e. sensations grow as the logarithm of the stimulus. For example, as the intensity of a sound is doubled, its loudness increases by one step on a scale.

Beer points out that in the nervous system there is a dual mechanism in which exhibition is balanced against inhibition.The way from the external sensor receptor to the brain is never direct. As the message pass from neuron to neuron, the nervous system may block and modify it. There is thus no guarantee that the message the senser receives is the one the brain receives. Beer explains that the maximum rate of discharge of internal receptor organs (neurons, synapses, ganglions) lies in the bracket of 100-200 pulses a second. The nerve channels can, however, cope with 300-400 pulses a second. The coded nervimpulses pass in different temporal sequences in many, parallel fibres.The brain then receives, decodes, conceives and experiences the incoming signals. It creates mental states, which form a basic attitudinal frame of reference or belief structure.

The physiology of receptivity explains our limitations but also the possibilities in social communication.

2.Perception

Popper (1981) suggests that the theory of senses as something primary for learning is wrong. He points out that people who are both blind, deaf and dumb, still are able to achieve a correct interpretation of the world. He takes Helen Keller is an example of that. No sense operates in isolation but in synesthesia or interplay of all senses.

According to Popper the senses have two roles; they first challenge us to make hypotheses, and second, they help us to match our hypotheses - by assisting in the process of selection and refutation. Popper states that the hypotheses always come first, before "sensory data". This can be interpreted so that the "external" information is initiated from inside. The senses help then to "test" this inside information (hypothesis) against the external world.According to this human information processing is predominantly internal and subjective.

Roszak (1986) confirms Popper's idea that new knowledge can be acquired without new information being received by senses. Learning doesn't take place only from "outside in". It requires also some kind of internal capability to be awakened.

Perceptions involve not only the reception of information by appropriate sensing organs, but also the coding, transmission and processing of this information by the internal nervous system. Perceiving is receiving, as well as a filtering process.The perceptive process involves basically three stages, according to Baird (1977): selection, organization and interpretation. Selection involves choices; we must decide what we are going to attend. The saying is that we see and hear what we want to see and hear. Psychological research claims that we choose according to our past experiences and tend to organize stimuli into recognizable patterns. How we interpret the information depends on the setting in which we observe the stimuli. Our interpretations are also affected by our projections. We rationalize our own behavior through our perceptions of others, for example, by projecting onto other people our own characteristics. However, we are trained to accept the outside data as objective and true. This has built up barriers against the internal knowledge. It denies also the strength of the receiver as the creator of the meaning. Learning is not just an acquisition of external information. The prerequisite for learning is the wilingness and ability to listen.

3. Beliefs - the context of "interior messages"

People don't respond and react only to verbal or other outside messages, but to the unspoken beliefs. The message that comes through senses is mediated through the belief systems. For an individual or an organization there are actually no "facts" but messages filtered through beliefs.

Beliefs are patterns of "interior messages". They move more rapidly than verbal/physical messages. Because they go first they should be the working ground for the systemdevelopment.

Beliefs for systemdevelopers are like colors for the artists. Beliefs color the attitudes, which, in turn, influence the thoughts and feelings, for example, concerning the technology. Beliefs have impact on the choices, in which the receptive communication is grounded. Human mind has got the ability to see its own beliefs, reflect upon them and evaluate their results. This ability is essential for effective receptive communication. How this ability is utilized affects the receptivity and openess in communication.

It is always easier to interpret, understand and evaluate information that is congruent with one's own beliefs. "Relevancy" for us implies often that some filtering process has taken place. The receiver who is not aware of his/her own belief systems cannot "sense" other systems correctly and cannot therefore act independently either. He cannot manage his/her own cognitive dissonance (a discrepancy between experiences and perceptions).

4. The Theoretical Foundation

"Receptive communication" in this report is used as a general term for "internal communication" consisting of receiving (sensing), interpreting, evaluating and responding. Receptive communication is thus not only a question of sensing (taking in information) but also giving out, i.e. responding. Receptive communication process starts with sensing (reception) and ends with response. Previous research in receptive communication has been focused on interpretation and meaning, which are considered to be dependent on the receiver's background and past experiences. I have suggested before that the focus should be shifted more on to the present time and expectations , which are the base of the future.

The discussion of receptive communication in this paper is largely based on the research and theory of listening, which has become methodologically, theoretically and empirically grounded in the field of receptive communication research. As receptive communication it differs from other receptive skill such as reading. Barker (1988:2), for example, states that the difference between receiving a message and listening actively to it is similar to the difference between scanning a textbook and reading it for comprehension and retention. According to him, listening is an active and advanced form of receptive communication. Researchers in listening consider it as an activity displaying cognitive-structural features similar to the development of knowledge. It is closely related to learning.

Bostrom (1990:124) refers to Sypher et al who show a number of positive correlations between listening and social-cognitive and communicative abilities. He refers simultaneously to Betting's and Payne's finding according to which more developed listening abilities are found in individuals with higher level of cognitive differentation. Listening is closely related to learning but it is not learning.

Listening as a research area got off at the end of the 1970s, but the pioneering work had started already in the 1950s. Still at the beginning of the 1900s listening was considered as a part of speaking. For a long time it was associated solely with verbal behavior .

The subject has been developed faster methodologically than theoretically. Already 1953 the first standardized listening test (Brown-Carlson) was published. After that it has been criticized and several other tests have been developed. During the 1980s a lot of books were published in listening. Also during the 1980s training programmes were adopted at schools and organizations, mainly in North America. Listening was also adopted in USA as a basic school subject 1978 equal to reading, writing and arithmetics.

a) What is Listening and What It Is Not

Nichols (1987) summarizes different definitions of listening to the one, stating it as a process with four stages; 1) attention (sensing), 2) interpretation (comprehending or assigning meaning), 3) evaluation (analysis or reflection upon) and 4) responding (recalling). The active listening process in the literature, is often characterized by such qualities as openess, attentiveness, self-awareness, presentness. Listening can be active and yet silent by means of presentness and non-verbal awareness.

We learn first to listen, already in the womb. We listen before we speak, we speak before we read, we read before we write. Listening, being the basic communication skill affects all the following skills mentioned here. We use also listening more than those other skills.Rankin (1926) states that we, as adults, spend about 70% of our waking day in some form of communication. He broke this communication in four categories:

* writing (9%)
* reading (16%)
* speaking (30%)
* listening (45%)

Nichols (1957) was first to point out that our schools are "upside down" concerning training and teaching of communication skills. Listening, which is used most , is the least taught communication activity.

There are many misconceptions about listening. One such misconception is that listening is passive. Listeners consider themselves as passive putting the responsibility of their listening onto the speaker or the sender. Steil (1983:19) reports that 70% of the seminar participants believed that the primary responsibility for communication success rests with the speaker, 25% with the listener and 5% failed to respond.

Another misunderstanding is that hearing is listening. Hearing is only one of the first steps in the listening process. Listening is sometimes considered as opposite to talking. However, listening is a precondition to speaking. The better we can listen the better we learn to speak. Listening is also often associated with agreement or obedience. But to listen is not to agree. As a result of listening there can be agreement or disagreement, obedience or disobedience.

Listening is to be aware, to be present. Smith and Williamsson (1982:35-36) write that we must listen with all of our senses to achieve awareness. They state that listening means more than getting accurate meaning of the speakers statements. Listening means, according to them, undivided attention where all senses are involved. Receptivity is sensing dimensions (feelings and relationships) behind what has been said.

Listening is not thinking but all listening involves thinking processes. Speech-Thought -Time Differential says that our brain can process information at a rate of about 400-800 words/ a minute. A person speaks at a rate of about 120-180 words / a minute. We thus think about 4 times faster than we speak. A rapid speed of thoughts creates easily distraction in attention. Talking at the rate of 180 words or more /a minute helps the listener to sustain attention longer and comprehend the message better. Listeners usually enjoy more rapid speakers. This differential is utilized in technical time compression of speech, to improve (manipulate) attention.This can be compared to car driving; driving at 30 mph we tend to daydream, at 90 mph we pay more attention.

Time is compressed also in radio (music) programmes and in videotape production of films. Wolvin and Coakley (1992:244-245) write that by compressing the rate of their commercials, advertisers can increase the attention and retention of the receivers. According to a study made 1974 at the Syracuse University, students who used variable speech compressors saved significant amounts of time (an average 32%) and scored significantly higher at post-tests than those subjects who learned the same material at normal speed. However, compressed speech has no such effect if the context is unfamiliar. No matter how fast Chinese is spoken, if you don't understand it, you cannot make a benefit of the speed.

An most important aspect of this differential is how our thoughts influence our listening. Many distracting thoughts make listening difficult and exhausting. How we pattern our thoughts determines how we listen and receive, and consequently how we respond. When thoughts are organized, receptivity increases. To create meaning is to organize information. The other way round, organizing information is dependent on our thought patterns. The more organized (coherent, integrated) the thoughts the more intelligent the response.Intelligence is an order of things (including thoughts). And order is awareness. Organizing increases information and expands the time. By organizing our thoughts we get more time to listen (to create meaning). In active listening more time is created because the ratio between internal (subjective) and external (objective) time get more synchronized.

b) Modell of Listening Process

For most of us, listening is today an unconscious process. It has remained nonconscious because there has been practically no education and research in listening. According to Steil et al (1983) effective listening is dependent upon one's willigness and ability to listen. Willingness (or motivation) to listen and communicate is a distinguished property of receptive

communication process. Willingness is not just a question of attitude, it requires self-awareness, personal, inner security and self-knowledge of one's own listening habits and beliefs.

Steil et al (1983:21-29) present the following model of listening process, called SIER model. SIER stands for sensing, interpreting, evaluationg and responding.

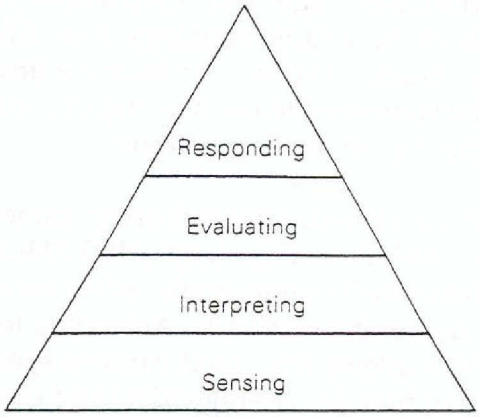


Fig 7 SIER-Model (Source: Steil et al 1983:21, fig 2.1)

The listening process starts with sensing. If the listerner doesn't sense anything he/she cannot pay any attention and cannot thus go further with it. The second stage is the process is interpretation, creating meaning. Meaning comes from inside the listener. Active listening goes ahead to the evaluative phase. In this phase, the message is weighed, sorted from opinion and judgement is rendered. Steil et al point out that poor listeners usually don't evaluate but jump directly into the (re)action after interpretation. The final stage, response, is the most "external" aspect of the listening process. By responding the listener gives out what he/she has got.

The SIER model can be used as a diagnostic tool to determine at what level the communication breakdown started. According to Steil et al we have to look to the lowest level at which the problem could have started.

Wolvin and Coakley (1992) distinguish between covert (internal) response and overt (external) response. The latter makes the receiver to the sender.We can also respond signally or symbolically. Signal responses are immediate and automatic. They are re-actions. A symbolic response requires interpretation and thought and thus occurs more slowly. Baird (1977) points out that while our responses to words ought to be symbolic, involving careful and rational thought, too often they are signal.

As described earlier, there is a qualitative difference between reaction and response. Action is a response in a given situation, while reaction means

compensation for another (re)action. Unability to respond directly to a situation is to be unresponsible for the outcome. What prevents or hinders receptivity and meaning creation, prevents basicly also responsiveness. Receptivity and responsiveness are mutually dependent, in the same way as hearing and speaking; hearing enables spaking. Steil et al (1983) suggests that the listener carries at least 51% of the responsibility in communications. In receptive communication there is the responsibility of choice; choice of attention, selection, interpretation and giving respons. To be responsive is to be responsible and vice versa.

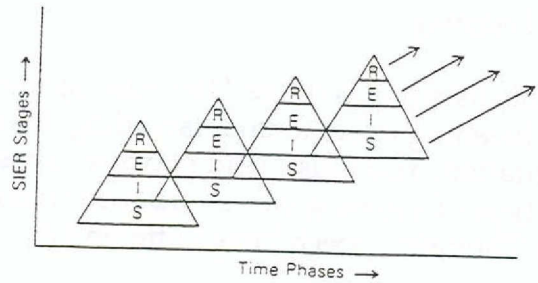


Fig 8 The Extended SIER-Model (Source: Steil et al 1983:28, fig 3.1)

The extended SIER-model illustrates the limitless potential for errors during the communication process between people over time. Add to this communication with several other people simultaneously and the risk for communication failures become even clearer. Errors occur at different communication levels and in different phases of the interaction when we switch back and forth in our sender and receiver roles sensing, interpreting, evaluating and responding. When several people are involved the meaning must be created collectively to make it a shared meaning. Some writers have dealt with the issue of how to create a better meaning collectively. One of them is David Bohm who developed "Dialogue", a sort of group listening process. Another is Michael Schrage whose message is that technology can be designed for better collaboration. I will refer to both of them later on.

c) Types of Listening

Different situations demand different types of listening. Many people have difficulty in adapting their listening to the situation. In the same situation we can choose to listen at different levels.The most common listening styles are presented below. These are mentioned in several educational books that deal with listening.

1. Discriminative Listening

This is the very basic type of listening. It affects the effectiveness of all the following types of listening. In this type of listening the listener discriminates different stimuli, visual as well as aural and kinesthetic. This kind of listening is important, for example, in paralinguistic communication (say, in telephone conversation) to discriminate pitches , intensity of the voice, rhythms, accents, etc. We discriminate also with eyes, for example how different artifacts are used, to recognize different "distances" (proemics) in communication, etc.

2. Comprehensive Listening

The purpose of this listening is to "get" the message as it was intended by the source. This listening refers to understanding, for example, the main ideas in a presentation. You must "read between lines" to get the message. To improve this type of listening we can train our memory and take advantage of the Thought-Speech Time Differential.

Memory plays an important role in this type of listening. Research has proved that we remember easily if information is meaningful, useful, interesting, extra ordinary, organized visually and associated with positive feelings.

3. Critical or Evaluative Listening

This kind of listening is informational or conceptual. It is needed, for example, in problem discussions, when listening to classroom lectures, etc. This type of listening is emphasized in our schools. It concers, among other things, source credibility, influence, intentions and motivations in the messages.

4. Emphatic (Therapeutic) Listening

This kind of listening is interactive. It is important especially in the therapeutic work in which you must be able to listen actively to feelings and to silence .This type of listening requires focused attention and supportive communication climate. High level of responsiveness is especially important.

5. Appreciative Listening

This kind of listening is an aesthetic experience. It refers to listening to arts, music and to the nature. This type of listening deals with enjoyment, appreciation, aesthetic and other experiences of high quality. However, it is not the source but the individual response that defines the appreciative listening.

6. Perceptive Listening

This is holistic listening. You use your both brain hemispheres and all senses smultaneously. It means listening to the cultural patterns, to the "signs of the time", to relationships at different levels simultaneously, etc.

5. Organizational Receptive Communication

Receptivity (and listening) is still often considered as an individual characteristics. Organizational receptive communication is a process or an activity based on shared meaning (shared information). Although individuals may be effective at the interpersonal level, these interpersonal communications cannot be identified with a viable, effective organizational communication. Organizational communication problems cannot be solved at the interpersonal level because they are often "system problems". Organizational communication is collective. Collective perceptions (beliefs) modify individual perceptions. They act as a framing device for object perceptions (like perceptions about technology).

Communication in organizations is still usually perceived as dissemination of information.There are designs and plans for communication loops and information flows based on the sending side, but ignorance for corresponding loops on the receiving side. There can be so many sending loops that people receive frequently messages which have little, if any, to do with carrying out their organizational tasks.

To see organizations from the receptive perspective new concepts and models must be developed. This chapter summarizes and integrates some ideas that are useful in this dvelopment work.

a) Organizational Awareness

Above I have already discussed the limited range of human perceptions in the electromagnetic field.Presman (1970), a Russian physicist, states that an organized group is more receptive and viable than individuals. Presman studies the type of communication - as he says - " where you can recognize the signals but cannot identify them". According to him, reception of electro-magnetic signals is improved at complex system levels regarding the whole system. "Organization" (integration) is crucial for effective receptivity. Highly organized or integrated systems with complex cognitive frames give rise to more open -minded expectations and solutions, according to him. Presman's studies concern predominantly animal societies although he seeks analogies to human society. It can be discussed how far his conclusions can be applied to human society.

Johnson (1994) states that individual and organizational information seeking has already become a critical determinant of the system success. Ignorance, states Johnson, is a result of the failure to seek information but it is also the cause to lacking integration. According to him, some organizations are designed to encourage ignorance. Ignorance leads to ineffectiveness and lack of motivation. He refers to the theory of Requisite Variety stating that complex organizational environments require more complex internal communication relationships.

Johnson introduces the concept of "information field", which refers to the level of information sharing and searching. "Information fields" determine the level of awareness and knowledge of the organization, the starting point for information seeking and acquisition. Johnson describes some determinants in the outer information field of an organization such as technology, inter-personal networks, physical arrangements, symbolic artifacts. He means that expanding the information field is crucial for individual and organizational success. This expansion is dependent on how information is shared (i.e. communicated).

Organizational awareness depends thus on the organizational integration. Integration increases receptivity. An important component of this integration is "information field" that indicates how information is shared in organizations.

b) Organizational Listening

There are several studies and writers who stress the importance of listening in organizations. Handy (1978), for example, suggests that we need to encourage and promote the role of listeners in organizations. Peters and Waterman (1982) argued that a distingusihed characteristics of succesful American companies was listening to employees and customers.

Bostrom (1990) points out that listening research in the organizational context has been frequently called for, but infrequently conducted. Gilchrist and Van Hoeven (1994) , one of those few who have conducted studies in organizational listening, suggest that the implicit definition of listening seems to shift from one context to another even within an organizational setting. They propose that listening is to be conceptualized as a characteristic of context or as a characteristic of organizational culture. It is thus not only an individual characteristics.

1. Listening is an Important Managerial Attribute

Steil et al (1983) refers to Keefe who states that business executives spend 63% of their days in listening. However, a few managers have got training in listening. Maude (1977:107-110) reports that managers whose listening ability has been improved through training has often reported an improvement in their relationship with their employees. He states that " a company without managers who cannot listen is like a man without sight and hearing, cut off from what goes on all round." Maude stresses that listening is essential for sound decision making.How well do the managers listen?

Browell's (1990) study showed how managers themselves and their subordinates rate manager's listening. Managers gave themselves higher ratings on all factors (stages of listening), except understanding and memory. Bigest differences in these ratings between managers and their subordinates were found in interpreting (emphatic listening). Managers themselves believed they recognized employees' feelings, but the employees disagreed. This indicates that the "unknown I" of the managers in the Johari window needs to be reduced to effectivize communication.

Browell compared also mangers' self reports in service sector (hospitality) and high-technological industry. She found that managers in these two sectors rated themselves equally concerning attention. High-technology managers rated themselves high in evaluative listening (evaluation, understanding and memory) but relatively low in interpreting and responding. Hospitality managers rated themselves high in interpretation and responding but relatively low in evaluation.

The conclusion about this could be that high-technology managers are active, critical listeners but not responsive. They are not very emphatic in their listening. Hospitality managers are very responsive and active in comprehensive and emphatic listening, but not in evaluative, critical listening. These self-evaluations should be completed by subordinate or customer evaluations.

Listening is crucial in order to avoid problems with information overload. Listening is an internal process requiring inner motivation and willingness. Inner motivation reduces information overload.

Goldhaber et al (1979) state that intrisically motivated managers have a greater propensity to withstand information overload than the extrinsically motivated managers. Persons with intrinsic motivation have a more sophisticated information processing capability than those with extrinsic motivation, according to Goldhaber et al.

2. Organizational (Collective) Attention

Listening to a collective, such as a group, is more difficult than listening to individuals, because it demands an awareness of subtle interaction patterns. Bohm (1990) states that synchronous collective communication cannot function by correcting individual actions and reactions (for example, by a "right answer to a specific question") but by listening to larger sequences, interactions and patterns. He stresses that the important point is not the answer to the particular opinions, but rather the softening up, the opening up, of the mind so that all opinions can be looked at once as they are. He stresses also that in group communication everyone must be able to listen to the whole situation, to what's going on in the whole system and in the relationships. Organizational attention depends on the collective ability to listen to larger patterns. Communication patterns in organizations determine which information is attended. Meaning is in the patterns, in the sense of continuity. We need methods to measure attentiveness and patterns.

A big problem in organisations is how to balance different claims on information. Organizational communication deals with how to integrate different coding patterns.Etzioni (1975) defines effectiveness as a pattern of interactions. Two patterns have rarely the same effectiveness value. He points out that how to value different pattern has rarely been discussed.

One classification of patterns is provided by Hawes (1970) who states that the quality of relationships reflects communication patterns that either conceal, reiterate or disclose information about the the character of the relationships. Patterns that conceal lead the system into an entropic state. Patterns that reiterate information place the system in a transitory state. Pattern that disclosure information place the system in a negentropic state. Focused relationships enhance communication, according to Hawes. Attention is sharpened when it is focused.

Much of the organizational life (as life in general) is characterized by dualism and the problem how to integrate different complementary aspects of the reality. Goldhaber et al (1979:83-85) define "organizational intelligence" as the organization's ability to assess both subjective and objective, rational and irrational information. An intelligent organization, according to them, takes into account both logical information and less logical communication processes. It considers both the context and the content. They state that it is the recipient/user who diagnose the human and technological system variables in order to process information based on its intelligence value. The recipient is the integrator.

3. Meaning is Created on Boundaries

Literature of organizational communication often mentions that the messages should be "translated" at the critical levels as they move up and down the line to the specific meaning they have for the given sectors of the organization.

Organizations are faced with the problems of relative incompatibility of different communication systems at their interfaces both internally and externally. Different functions, groups and competencies code information differently. People with different expert knowledge have different ways to organize information.

As organizations operate in increasingly complex environments, the ability to gather, interpret and evaluate information becomes critical. When environmental receptivity is low, organizational tend to have a higher proportion of boundary roles and environmental strategies. Increasing demand for lobbyists indicates that receptivity is low in the environment and/or that there is a need to manipulate the pattern of receptivity.

In receptive organizational communication the boundary persons and functions play an important role. These interpret the meaning of environmental information and bring it forth in the organization.

4. Organizational Responsiveness

Responsiveness itself creates receptivity in the environment. Goldman and Theus (1994) studied the relationship between organizational communication style and information seeking of the publics. The motivation to seek information from or via the organization is dependent on the communication style of that organization. Receptive organizations make people more active in their receptivity. And, the other way round, organizations can communicate more easily with aware and active publics, according to Goldman and Theus.

These researches distinguish between symmetric and asymmetric organizational communication styles. Asymmetric organizations decide what the public needs to know, symmetric organizations ask what the public need to know. Asymmetric organizations are defensive about their own communication. They don't listen. Members of the asymmetric organization tend to be ambivalent in their attitudes concerning the organization. This is reflected in the way the public approach the organization. The public is "neutral" or passive in its information seeking vis á vis such an organization.

c) Listening and Learning

When comparing some learning models with listening process model the similarities are striking. Take , for example Huber's (1991) model for organizational listening .

Organizational Learning (Huber)	*Listening Process (Steil et al)*
knowkedge acquisition	*Reception, attention*
Information distribution	*Interpretation, meaning creation*
Information interpretation	*Evaluation, Memorizing*
Organizational memory	*Respons*
I nformation Retrieval	

According to Huber, organizations acquire information by monitoring the environment. Thereafter the information is distributed inside the organization to facilitate its sharing. Huber call distribution for communication. He means that new technology has impact on the way in which information is acquired, distributed and stored.

In spite of these similarities in terminology and the formal modelling there are crucial differences between learning and listening. Listening is a precondition to learning. The more active listening the more learning potential there is. Learning is often discussed as something that takes place because of the environmental influence or as feedback , for example, from the teacher. Learning can be a kind of fabricated change. Active listening is a way to maintain a balance in the way we receive information and stimuli and respond to it. Listening is a way to relate internally and externally. It is an interface between the outer and the inner world. Listening and learning are closely related to each other but listening is not just an aquisition of cognitive knowledge.

6. Technology and Listening

a) Technology Facilitates receptive Communication

There are different approaches to technology. Raymond Williams (1974), for example, means that technological effects can only be studied in a relation to intentions. What is significant, according to him, is the direction of attention. He stresses the ends. Frederick Williams (1983) stresses the means and states that there is a confusion of means and ends in the application of technology. The problems are the results of lack of understanding of application (means). He suggests that technology could be seen as a catalyst or an intensifier of change.

F. Williams points out that information- and communication technologies can be designed and redesigned by users through software and in component configurations. The technology enables, but doesn't determine, the changes. It facilitates processes and creates possibilities. Like a catalyst, it doesn't work in terms of objectives or for solely its own existence. It allows the change to take place but doesn't determine the final result. Technology is a part of the problems but also a part of solutions.

I think, seeing technology as a catalyst, in this sense, is an appropriate approach to build further research on. As a catalyst, what does it do to enhance or reduce receptivity and listening?

1..blurr boundaries

Rice and Ass. (1984:34) write that new media are blurring distinctions that seemed clear and useful a generation ago, such as transmission versus reception. A mediated information exchange now may involve so many transmission transformations, according to Rice et al, that any given medium can be both a trasmitter and receiver, both medium and content.

Technology facilitates breaking down even other distinctions. McLuhan and Powers (1989:148) state that electronic technologies have began to shake the distinction between inner and outer space, by blurring the difference between being "there" or "here". According to them, the first hint of this came with the telephone. By increasing the speed of the private voice, it gave everyone the feeling of being everywhere at once. The physical presence was no more a primary condition for communication to occur. The new generation of phones eliminate even time restrictions. Voice-boxes, voice-store-forward, etc., eliminate calls that require no immediate attention and send messages digitally by computer to any number of recipients.

Technology facilitates to shift the focus on the receiver and the "spaceless" information processing. It points out that more attention must be given to interpretation and meaning creation.

2...turn the implicit to the explicit

McLuhan (1966) defines technology as "explicitness"; technology makes human communication more explicit. Mediatechnology has long been conceptualized as a materialization of human communication, bringing the internal in line with the external. The technological system is thought to be an extension of human sensory system,to detect and register better the environment. "Sensing" is consequently defined as the selection of relevant information from the environment. The techological development has made it possible to "sense" in wider time and space structure than before.

When receptive communication is taken as the ground, the technology is used to bring the external world in line with the internal. Rafaeli (5) writes that media has been likened to a window on the world. He wonders if the presence of interactive arrangements in some media turn this window into a reflective mirror. Via interactivity, he argues, the use of media may provide opportunities for introspection, not only for inspection. Rafaeli suggets the possibility that media interactivity contributes to a more internal communication. He, however, stresses the the difference between social and technological interactivity; technological interactivity can be faked. Technology facilitates the shift of attention to internal information processing.

3....point to ignored skills of communication

Technological applications are no more limited to formal communication but include also informal applications. Technology is not applied only to vertical, but also to horizontal communication. Wolvin and Coakley (1992:21-23) point out that technological development, such as minituarization, has contributed to listening growing in importance in our lives. They refer to Freedman who has stated that "we have slowly but emphatically shifted our means of communication from the printed word to images and sounds, from books to television, movies, radio and recordings. Instead of reading, most of us prefer to look and listen."

b) Technology versus Listening process

Media research has predominantly been grounded on the sender perspective, i.e. how to influence and control the receiver. Many writers stress the role of the receiver, but often from the sender point of view. The interest in media

studies had thus been focused on how the medium can affect the message transmission. Bretz (1971:37), for example, states that "the medium shapes the message",because each medium requires the message to be coded into different format, using different set of techniques and resulting in a different kind of programs and responses.

Consequently, m ost of the studies refered to below are also so called impact-studies, i.e. they build on the old Shannon-Weaver thinking of communication.The contextual aspect (organization, culture) is often ignored in these studies. Because the purpose, theory, circumstances and methods vary in these different studies, no general conclusions can be made. They give, however, som ideas about how technology may or may not improve receptive communication .

As stated before receptivity includes attention, meaning creation (interpretation) and responsiveness (recall). The following rewiev of different studies is organized according to this model.

Future research in technology and communication, I suggest, could be based on this "new" model of communication which is grounded on the theory of listening.

1. Attention via Media

Attention is the first stage of the listening process. How do technology improve or hinder our attention? Baird (1977: 258) states that the medium through which we transmit a message gives the receiver cues concerning our attitudes toward the receiver and toward the message, and thus significantly affects the impact of the message. He refers to other studies, made in large USA companies, that indicate that important messages are sent orally, often combined with written messages, while less important messages are sent in writing. The medium gives a "message" to the receiver how important he/she is regarding the information.

What happens if the sender's media preferences are not compatible with the receiver's. Effectiveness in communication is apparently decreased. Wolvin and Coakley (1992:131) refer to Tries and Trout who state that advertisers spend 55% of their advertising dollars on visual media and 45% on audio messages. However, research suggests that consumers spend 85% of their time in audio-oriented media and 15% on print (visual) media. Differences in media preferences apparently affect responsiveness.

Alexis Tan (1985:175-76) writes that receivers focus their attention more on the source than on the message when video and audio media are used. Nonverbal

communication characteristics become more salient and more important determinants of opinion change when video and audiotaped messages are used than when written messages are used. According to him, people in audio condition are generally rated more favourably than in video and face-to-face condition.

Bostrom and Searle (6) refer to studies made in instructional settings that don't indicate any significant advantage of one medium over the other. They state that it may be that for information acquisition there are truly no differences among the media. Or the differences are subtle and importantly affected by other factors. Bostrom (1990) suggests that media effects are interactive ones, i.e., the effects appear in one subgroup but not in another. If this is so, it is a vain effort to try to map "main effects" of technology. Information acquisition may be influenced by such factors as intelligence, sex, affection, etc., according to Bostrom.

2. Meaning via Media

Communication is sometimes defined as the process of eliciting meaning. Meaning creation includes interpretation, comprehension and retention. The purpose here is to explore what media research says about meaning creation by means of technology.

Birdwhistell (7) has estimated that in face-to-face interaction the words spoken account for less than 35 % of the total meaning produced. The remaining 65% is elicited by non-verbal cues. Mehrabian (1971:44) claims that up to 38% of message meaning comes from the vocal, 55% from facial and only 7% from verbal. Based on this we can hypothetize that "live" (face-to-face) produce more meaning than audio media. Audio, in turn, produces more meaning than written (verbal) words. What is the role of video in this regard? Bostrom (1990) refers to a study that demonstrates that messages presented in audiotape more closely resemble messages presented face-to-face than do messages presented in videotape.

He refers also to another study that suggests that persons with access to only audio cues and persons with access to both audio and visual cues have the same accurancy rates of detecting deception.

A hypothesis could be that the "richer" the medium the more meaning it creates. The richest medium is face-to-face contact. However, Bostrom's references indicate that "richness" may not be as important for meaning creation as we believe. Instead we could hypothetize that audio media create more meaning than videomedia. Meaning is not constant. Rather it is constantly negotiated, according to Bohm (1990) . If meaning is flowing and fluctuating, how can it be improved by means of media? Meaning is in patterns, in the sense of continuity.

a) Give Different Media Different Meaning?

Schnapp (1991) studied whether differing channels - visual, verbal, vocal, combined - had significant impact on the assignment of meaning. The findings showed no significant differences between the affirmative and negative messages in the combined channels. The verbal channel may be a more effective channel for negative statements, while the visual channel is appropriate for affirmation messages. She means that the significance found in the direction of the negative condition in the verbal message reinforces the need to be aware of the power of a single word for changing the meaning of the message. Schapp refers also to a series of studies that indicated how the outcome of interpersonal attraction may be affected by one's sensibility to non-verbal communication.

Bostrom and Searle (6) write that the technological revolution challenges our understanding of listening because of our assumption that the use of technology in and itself has an effect on message understanding. This assumption, state Bostrom and Searle, is firmly rooted in the supposed presence or absence of "social presence". If this presence of other people is indeed a vital part of interaction it must have an effect on communication, i.e. we must know where we re when we communicate. .

Moden technology reduces non-verbal cues in telecommunication. How important is the "presence" of other people to get the meaning across? Today's communication is very much based on that we know the place, i.e. that we know where we are when communicating.

Kreuger (1983:101) states that auditory expectations are less crucial to our interpretation of the physical world than visual expectations. Sounds are thus less responsible for determing the sense of place, according to him. The question is if increasing auditory communication via audio media makes place (space) "vanish" perceptually .

This kind of studies (how certain technology creates meaning or not) should be compared to studies that look for answers to the question of how and why people use these technologies. What meaning the technology gets depends on the meaning of its use. Another issue to be explored is the "sensitivity" or attitudes towards different media. For example, Schmitz (1987) found that supervisors' usage patterns of media explained 20% of the variation in usage patterns by subordinates. This finding suggests that the usage is socially and hierarchically determined to a certain degree.

The way people use the technology constitutes both a constraint and a possibility in the systemdevelopment. The uses of which people put the technology have consequences for the future possibilities of that technology.

Why technology is used may reveal the meaning that the technology facilitates to create. Cumpert and Cathacart (1986), for example list some reasons for using technology; prestige and status, entertainment (technology is an end itself), personal experiences as a compensation for something else, participation in the "technological stories" to share the cultural meaning and patterns of behavior., to routinize one's life in order to increase its predictability etc. Meaning can be derived from the patterns of use.

The receptive orientation, as oulined above, put the focus on expectations. Expectations create the reality. Voluntary use of technology is related to the expectations about how communication works in the organization. Over time, our expectations will institutionalize the technology. We make the world to fit to he expectations we have. As the saying is, we get what we expect and what we expect that we get. How powerful these expectations are depends, among other things, on the feelings behind.Feelings, as well as thoughts, are based on beliefs. The context of receptive communication is the belief system. Meaning is always created in the context (of beliefs).

b) Can Meaning Increased by Increasing Channels?

As stated before, listening is a multisensory skill. Consequently, meaning is a multisensory experience established in the interplay of all senses. Accordingly, it can be hypothetized that more channels or media together would create more meaning.

A number of studies support the view that comprehension of the message increases with the addiction of channels, and that the non-verbal channels, particularly the visual, are highly influential in establishing the meaning of the message.Rosenthal, Hall, DiMattio, Rogers and Ancher (1979) offer further insight concerning the functioning of various channels in influencing receivers. Their studies suggest that increasing the number of channels used in sending a message adds to the overall meaning of message. However, Broadbert (1984) suggests that a limited amount of information at one time can be processed effectively .

One finding in the studies, that Schapp (1991) refers to, was that adding information from tone, body and face contributed to accurancy in approximative ratios of 1:2.4 respectively. These studies thus suggest that increasing number of channels used in sending a message adds to the overall meaning of the message.

A critical voice comes from Rosenblatt, Cheatham and Watt (1977:12) who state that multimedia presentation maybe impressive but actually may reduce retention of the message. They explain that the human nervous system can assimilate multichannel messages better if those messages (audio and visual) are presented sequentially rather than simultaneously. The best results, according to them, are obtained with sequential combination of oral and written communication channels.

As more stimuli are added to the senses, the total capacity increases, but accurancy decreases, according to them.

c) Critical Voices - Technology Doesn't Help to "Get" More Meaning

There are writers who state that the technological development doesn't help to crate more/better meaning at all.

McLuhan (1966) and Nevitt (1985) point out that we have not been able to create shared meaning by means of technology; by satellites, by speeding up information, by transcending time and space. On the contrary, McLuhan believes that collective consciousnes (shared meaning) is diminished by artificial, technological extensions of human being. He takes the languages as an example. They separate people instead of uniting them.

The critics get support from Klapp (1982:64) who writes that information accumulating at an exponential rate is outslipping meaning formation so that we have more and more knowledge of which we do not know what to make - a growing gap of which produces symptoms so many writers have described as a "crisis of meaning".

Meaning means continuity or pattern. Research has not yet considered how "time" is created in listening process. Speech-Thought-Time Differential is an interesting phenomenon that may open up doors to new knowledge about how we create time in communication.

3. Responsiveness

Responsiveness includes, among other things, recognition and recall. Responsiveness is expected to increase in interactive systems. Many new technologies promise to introduce some form of interactivity. Media "richness" is a quality that implies channel capacity including the capacity to provide feedback and carry symbolic meaning (Salem 1994). Interactive media facilitate links between groups and individuals. They also facilitate horizontal communication, which is crucial for innovation diffusion. By definition, effective horizontal communication requires good responsiveness.

According to Tan (1985) written messages are more easily learned and remembered than either audio- or videotaped messages. He explains this by pointing out that the information encoding capacity of the eye is greater than that of the ear. Written messages are more productive in cognitive learning.

Technology is today used more as a tool to rationalize and to increase productivity than to enable communication and internal learning. It is used more to create reactions or certain responses than to enable responsiveness. Because responsiveness is supposed to be especially crucial in education, media studies from that sector are important to follow. White (8) refers to Fredin's study of interactive systems in education. He studied the links between interactive television links and interpersonal communication. In conclusion, the interactive systems increases the diversity of ideas within a group, but that increase was regulated by the structure of interpersonal communication within a group. White states that there is evidence that people will use interactive services only when the communicative interactions replaced by these services are not important for them. The technology doesn't overwhelm the relationships.

Roberts and Vinson (1993) tested how media (audio and visual) through which listening was tested affected the result of that test. The test used was Watson-Barker Listening Test. The results revealed, among other things, that participants (students) consistently scored higher a video listening test than the corresponding audio test, based on the same stimuli. This was significant especially when the responses were presented aurally. Their analysis reveals that decision concerning how response choices are presented is important for the results. The medium through which the recipient's response is given influences the results of communication. The focus has by this been on the medium through which the message is sent.

According to Wickman (9) people would show greater negative emotional rersponses to machine errors following voice input than they would following manual input. There seem to be more personifications of the machine, during voice entry than during manual entry. He concludes that when people operate machines by speaking to them, they come to personify them.

Some of these studies, refered to above, take into account feelings but don't give information whether communication is inhibited by negative evaluations or facilitated by positive ones . It seems that negative affects have been more extensively studied than the positive ones.

7. Technology and Organizational Communication – an Integration

a) Technology and Organization

1. T echnology Provides Possibilities

Modern technological advances enable us to gather together as a group even at great distances and independently of time. Group communication is facilitated and supported by computer networking and conferencing. E-mail permits a high degree of written interaction with a high degree of flexibility. Conferences can be held between people who have never met. Information can be passed anonymously. Networked computers permit several people to be involved in authorizing a document, sometimes at great distances.Network provides the foundation for communication and information spaces in which individuals have access to vast number of people. How does the technological network fit to the organizational (collective) communication patterns?

How new technology is accepted and implemented depends on what individuals and organizations are ready to receive and how they communicate (share information). By definition, networks are activated and acted from inside out and is supposed to work ahead with visions rather than by directives from behind.Networking is basicly a groupactivity. Does our organizational thinking fit to the idea of network?

2. Organizational Thinking Creates Constraints

The old organizational thinking emphasizes the transmission of command instead of negation of common meaning. The classical view of organization is tightly coupled: information and command passing top-down from the source to the receiver. Lasswells theory (1948) of communication "who says what in which channel to whom with what effect" fits to this organizational view. This kind of organizational thinking discourages experimentation and innovation of the new systems.

The organizational image behind the technological strategies have emphasized rationalization, specialization and formalization, which are the classical principles on how organizations were supposed to be run in the past. Today, many of the analyses of technology are focused on the traditional economic benefits or costs analyses and neglect the patterns of use and receptivity that maybe inconsistent with the economic conception of organizational life.

Some previous research indicates that computers do not cause organizational changes but tend to support or enhance established organizational trends that already exist.Taylor (1991) states that theories underlying Management Information and Decision Support systems (expert systems) incorporate much of the old assumption of organizational thinking. Work performance, according to that thinking, is considered as a matter of application of "scientific" (logical, rational) principles of management.

Taylor points out that the old model of organization is internally inconsistent, which creates counterproductivity. For example, the goal of this rational model is transparant communication. On the one side, the more rationality, objectivity and unity of command, the less transparant communication. On the other side the more transparant the communication, the less objectivity, formal rationality and unity of command. The result is that the more the organizations tries to increase its productivity (by rationality) the less it succeeds.Taylor stresses that transparant communication, being situations specific, presupposes understanding of context.

d) Collaboration

Can technology help organizations to listen? Is it possible to integrate listening, technology and organization ? How would that kind of integration look like?

Today the focus in systemdevelopment is on effectivization of processes. Business process renegineering (BPR) and Concurrent Engineering are strategies to make several processes simultaneously more productive. BPR eliminates all that doesn't add value to the that process. How about identifying communication processes, such as listening, and eliminate everything that doesn't add meaning and lead to adequate, timely responses?

Culnan and Bair (10) refer to interviews with managers who state that of the top 18 office activities that were perceived to facilitate productivity improvement, 11 were specifically related to communication. Rice et Ass (1984:203) point out that the primary communication difficulty reported by supervisors is listening in organizations. But they state that computed based communication systems are less likely to be appropriate for the task of increasing the "productivity of listening". Automation has greater productivity benefits for transactinal processes and less for managerial processes, such as listening, according to Rice et Ass.

1. What is Collaboration?

I find Schrages (1990) ideas of organizational collaboration promising regarding integration of technology and organizational communication. Schrage states that it is difficult to define precisely what collaboration is. He defines it therefore often by negation. It is not consensus. It is not teamwork. It is not participation, which relates to how the workplace is governed. According to Schrage, collaboration determines, instead, how well tasks are performed. He means that we collaborate not only with people but with patterns and symbols. He states further that in collaboration people are less interested in displaying data than in creating s shared space. Collaboration, according to him, is the process of shared creation. I suggest, listening is an important part of this sharing, because - in organizations - it is the process of creating a shared meaning.

Schrage argues also that collaboration takes communication back to its roots (sharing). He believes that it will become as important as interpersonal skills and verbal fluency and literacy. According to him, collaboration requires a higher order of involvement and a different approach to sharing and creating information. His ideas reminds the describtion of listening process. However, he doesn't talk explicitly about listening.

2. What is Collaborative (Listening) Technology?

Schrage's criticizes that we today use technology to share an experience rather than to create a shared experience. Collaborative tools are a medium of experience, according to him. They are driven by need of the people who use them. He states that tools designed to support collaboration are qualitatively different from tools designed to support individuals. Collaborative tools enpower not only individuals but the relationships they enter into, writes Schrage.

Schrage emphasizes that the issue is not to process information but creating it. He explains that media technology as a tool is as essential to the process of creation as new instruments have been to the advance of science and technology.

Schrage criticizes systemdesigners who, according to him, know far more about collaboration with computers than with human beings. The result of this is, as he says, that their "collaborative tools" (such as groupware) don't support natural human collaboration. He states that technology can be corrupted by people who would rather be more efficient than human. Designing for collaboration means that emphasis is shifted from networks of information distribution and transmission to networks of shared spaces.

Today the technologies work to reinforce the bias of media as the transmission of individual expressions rather than a mechanism to create understanding between sender and receiver.

3. What is Collaborative Organization ?

Schrage uses again negations; collaboration is not coordination. Coordination doesn't give more meaning to relationships. In collaborative organizations, says Schrage, the focus shifts from a display of results to a shared awareness of process. Such organizations are designed to interact with ideas, not just with individuals, not for presentation, but for collaboration. Schrage states that most organizations lack the collaborative infrastructure (information fields) that enable people to share their talents in ways that satisfy the individuals' needs for expression and organizations' imperative for results.

Schrage points out that the real challenge is to design structures that inspire. He believes that collaborative imperative will be an emerging force for productivity. It will give organizations a new measure of one another. Succesful collaborative architectures recognize that copresence can exists in several dimensions. Schrage emphasizes that important is how media blend together, interact, to create an experience in organizations.He points out that by now, management theories have been more concerned about coordinated activities than shared creation. He defines collaboration as the power of shared creation in which two or more individuals with complementary skills interact to create a shared understanding.

Although Schrage cannot point to specific solutions, he has outlined a vision of organizational communication that integrates both the technology and human relationships.

8. Suggestion to Research Approach

a) Towards an Integrative Model

Following questions are suggested as guidelines for research in organizations:

* Is any type of listening more problematic (lacking, dominating) than the others?
* Which stage of the listening process causes most errors?
* Which kind of receptive information coding patterns can be distinguished in the organization? How are they related to each other?
* How is the "information field" structured?
* How does the technological configuration facilitate both effective receptivity and responsiveness?

1. Ability and Willingness

Listening is dependent upon the ability and wilingness to listen. I suggest, these basic conditions in organization can be conceptualized as follows: Everyone has an ability to receive and code information. However, we do it differently. The question is how willig we are to listen to all information and how willing we share the information we receive. Willingness is primary, but without ability to listen the results are not effective.

Ability	*Technology*	*Willingness*
Present Assimilation Modes:		Listening Process:
- listening style	-present problems	-reception
- awareness (info field , patterns, integration)	-expectations	-interpretation
- complementary skills	-use	-evaluation
	-changes in interaction	-response

Collaboration

Fig 9 Collaboration as a Function of Motivation (Willingness) and Ability (Capacity)

I distinguished six different types of listening. Organizations may use predominantly one type of listening or a mix of them. Emphatic listening presupposes a supportive communicative climate. We don't possess even the beginnings of a technology of therapeutic communication. Effective comprehensive listening is dependent on good memorizing skills. Different organizations have different memories, or they memorize differently. Perceptive listening is associated with pattern recognition and cultural awareness. The present technology is applied mostly as a tool for discriminative and comprehensive listening.

2. Technological and Communicative Collaboration

Schrage(1990) expresses a similar idea as the above by means of the following matrix. Technological collaboration in the figure refers to "ability" while the conceptual collaboration represents "willingness" in the listening theory. Conceptual collaboration is sharing by listening (inclusive responding). Technological collaboration is the way people physically bring together their skills when solving problems. He states also that conceptual collaboration is more basic. Technological collaboration is an attempt to solve the problems conceptual collaboration has identified.

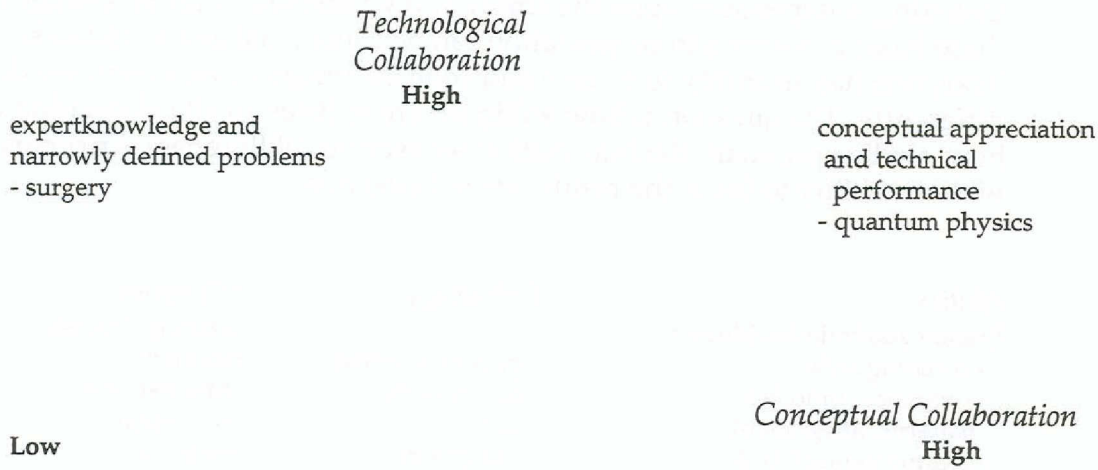


Fig 10 Technological and Communicative Collaboration.

Organizations and groups can be mapped in these quadrants depending on how they integrate technological collaboration (ability) and conceptual collaboration (willingness)

3. *Integration Increases Effectiveness*

In this context system effectiveness is a funtion of the ratio between the technological potentiality and the communicative actuality.

Beer's (1981) idea of the relationships between potentiality, capability and actuality, gives some further insights about how technology and communication may be related to each other. He means that potentiality >capability>actuality. In other words we always do less than we are able to do. In this context, potentiality refers to technological possibilities, capability to communication ability (competence) and actuality to willingness (motivation) to communicate.

Effectiveness
actuality/potentiality

Actuality	*"Filter"*	*Potentiality*
communication patterns	*organizational ability beliefs /perceptions*	*Expectations and perceptions concerning technology*

Capacity of Change

Fig 11 A Mesure of Communicative effectiveness

Effectiveness (performance) is the ratio between actuality and potentiality. Today, as it is said, communication effectiveness is in average 25%, (1/4). This means that there must be a "gap" between the actuality and potentiality in communications corresponding to 1/4.

Potentiality
"ought to do"

Latency
(Unused capacity)

Capability
"could do"
Ability

Effectiveness
Performance

Actuality
"is doing now"
Willingness
Motivation

Productivity

Fig.12 Effectiveness/Performance, according to Beer:1981 (p 164 fig 28 modified)

Willingness (motivation) is very basic for successful communication and for effective utilization of technology. But if there is no ability, pure willingness will not be enough. However, willingness usually leads to increased ability. If there is ability but no willingness, the situation is worse.

Ability, in this model, is floating between actuality and potentiality affecting either the one or the other, or both. According to Bostrom (1990) there is no definitive over all pattern between communication attitude and ability. He points out, however, that both of them show common definitional problems, which makes it difficult to measure their correlation.

To increase ability without to increase motivation to use that ability would be a vasted effort from the point of effectiveness, according to this model. To increase potentiality without increasing capability and motivation creates ineffectivenss. Today there is a lot of technological potentiality, but nor coresponding communication capability.

b) Identifying Complementary Receptive Communication Patterns

One of the most difficult listening situations is the meeting between complementary information coding modes. In such a meeting the reception and responsiveness become extremely important for succesful interaction.

1. Problem of Complementarity

The problem of complementarity is the different patterns of coding, not the amount or lack of information . It doesn't help to gather more information. The problem is to recognize the opposing code to get the point. No matter how much you gather information, it will just confirm the mismatch. The collision of complementary parties cannot be prevented by collecting facts.

When meeting one's complementarity it doesn't help to clarify or argue for one's own points of view. That may make the situation worse. It is also a mistake to try to influence, convince or impress the complementary coding partner. When meeting the complementary coding partner youprobably feel that you talk to deaf ears. You may feel that his/her actions don't make sense to you. You may feel that he/she is irrational, makes unnecessary and unexpected questions. Communication with the complementary partner is a struggle through many misunderstandings and hazards.

Complementary parts are logically impossible to realize simultaneously. They do not overlap each other. It is difficult to simultaneously recognize systems or patterns that do not overlap. Complementarity cannot be defined by outer criteria. It is like a right and left side. What is right or left depends one one's position. They must be determined inwardly.The languages of complementary systems cannot be translated into each other without destroying their meaning or message.

To recognize and understand one's complementary coding system one must first know one's own. The better one knows one's own, the easier it is to recognize the other. Complementarity cannot be recognized by outer differences. You must get inside the thinking pattern.

It is not a question of conflict that can be solved by a mediator. Rather, it is a dilemma or a "double bind". You hear the words and know what they mean but you see no use of them. You don't understand what the other one is doing. The same bit of information has different meanings for both of you.

When different coding patterns are applied together long enough in systemdevelopment, they become integrated. When they work in one direction, synergetic effects are created. When they start to contribute simultaneously, their similarities become more prominent than their differences.

2. Complementary Coding Patterns

Imagine two people sittting in the train on the opposing seats. Both are travelling into the same direction, in the same train and eventually to the same destination. One is sitting forward (in the direction of the train movement) while the other is sitting backwards. The first one sees through the window first the larger picture of the landscape that is approaching and then the details of it. The other one sees first the details and then the whole picture that has passed. The first one sees the "future" and the second one sees the "past" first. Everyone has a preferred way of absorbing information. One employee's favourite channel for receiving information may be quite different from that of a coworker. We have certain characteristics which make us more receptive to information when it is exprerssed in certain formats.

These passangers represent two complementary ways of coding information. Everyone has a natural tendency to the one or the other of the complementary perspectives. But we can acquire an ability to see from the other perspective. The natural ability is, however, always the most effective to use. The natural coding pattern is what benefits ourselves and others most. It is also the most effortless to use. If for some reason you don't value your natural pattern but try to work according to the other, a lot of effort/work is needed. And there is a risk that you send contradictory signals.

Servas (10) gives another example of complementary patterns on a global level by comparing the Asiatic and the Western modes of communication. According to him, the Asiatic mode of communication is indirect and implicit, the Western direct and explicitWesterners' communication is instrumental, emphasizing the exchange of ideas and thoughts. Westeners convince the recipients by rational, Aristotelian argumentation. The message, seen as a product, is the most important part of communication.

The Asians emphasize the emotional exchange, the being together. For them, not the product, but the process is most important. The Asias attempt to reach "total communication" whereas the Westeners are satisfied with "partial communication".

Westeners concentrate on encoding of issues, being sender oriented, while Asians attache more attention to decoding of message, being receiver oriented. Western culture is characterized by a strong self-image, while in Asia group consciousness plays a major role.

These different communication modes can be recognized even in the structure of the language, according to Servas. He states that Asian languages have developed on the basis of auditive interpretation (listening) and emotion (pathos). Indo-European languages are based on visual ascerntainment (seeing) and rationality (logos).

What is lacking in these models is the discussion of responsiveness, which as an important part of receptive communication as receptivity.

Notes

(1) Lawrence K. Frank: "Cultural Organization" in *Ruben and Kim (eds) 1975:131*

(2) D. Ewen Cameron: "Ultraconceptual Communication", in *Hoch and Zubin,* (eds) 1958: 17-27

(3) Laureme Wylie: " Language Learning and Communication", in *The French Review,* Vol VLIII, No 6, May 1985

(4) William S. Condon: "neonatal Entrainment and Enculturation", in M. Bullona (ed) 1979:*Before Speech; The Beginnings of Human Comunication,* London, Cambridge University

(5) Sheizaf Rafaeli: "Interactivity - From New Media to Communication", in *Hawkins, Wieman and Pinger 1988*

(6) Robert N Bostrom and D. Bruce Searle: "Encoding., Media, Affect and Gender", in *Bostrom 1990:25-41*

(7) Ray Birdwhistell, referens i *John E, Baird (1977)*

(8) Elisabeth S. White: "Interpersonal Bias in Television and Interactive Media", in *Gumpert and Cathacart 1986*

(9) Harvey Wickman: "Human- Machine Interactions in Spaceflight" in *Stuart Oskarp and Shirley Spacapan* (eds) 1990: 255-256

(10) Culnan and Bair 1983, reference in Rice et Ass 1984:118

(11) Jan Servas: "Cultural Identity and Modes of Communication", in Andersson (ed) 1989: *Communication Yearbook 12, pp383-416*

Literature

John E. Baird (1977): *The Dynamics of Organizational Communication,* Harper Row

Stafford Beer (1981): *Brain of the Firm,* John Wiley & Sons

David Bohm(1990):*On Dialogue,* David Bohms seminars, Ojai, California (a booklet)

Harold Bostrom (1990): *Listening Behavior,* New York/London, The Guilford Press

T. Dowing Bowler (1981): *General Systems Thinking,* New York/Oxford, North Holland

Judi Browell: "Listening in the Service Industries- It Makes Good Cents", in Deborah Borisoff and Michael Purdy (eds) 1991: *Listening in Everyday Life* University Press of America

Collin Cherry (1978):*On Human Communication,* Third Edition, The MIT Press

Anthony J. Clark: "Sub-Threshold Auditory Stimuli in Listening", *Journal of International Listening Association,* Volume 4, 1990, pp 83-84

Richard V. Farace, Peter R. Monge and Hamish M. Russell (1977): *Communicating and Organizing,* USA, Addison-Wesley Publishing Company

Frank E.X. Dance (ed) 1967: *Human Communication Theosy* , USA, Holt, Rinchart and Winston Inc.

Amitai Etzioni (1975): *A Comparative Analysis of Complex Organizations* , New York, The Free Press

Jeremy Gampbell (1982): *Grammatical Man,* Simon & Schuster Inc. A Touchstone Book

George Gerbner, Larry P. Gross, William H. Melody (eds) 1973: *Communication Technology and Social Policy - Understanding the New Cultural revolution"*, New York/Toronto, John-Wiley & Sons

Lames A.Gilchrist and Shirley A Van Hoeven: "Listening as an Organizational Construct" , in *Journal of International listening Association* , 1994

Gerald M Goldhaber (1983): *Organizational Communication,* Dubuque, Iowa, Wm.C.Brown Publishers

Gerald M. Goldhaber, Harry S. Dennis, Gary M. Richetto, Osmo A, Wiio (1979):*Information Strategies* , Englewood Cliffs, New Jersey, Prentice-Hall Inc.

Sylvia H. Goldman and Kathryn T. Theus (1994):*The Relationships between Organizational Communication Style and the Motivation of Publics to Seek Information to Meet Their Needs.* A paper presented at the International Communication Division (ICA), Sydney, Australia, July 1994

Charles Hansy (1978): *Understanding Organizations,* Penguin Books

L.C. Hawes (1970): *An Empirical Definition and Analysis of Physician-Patient Communication Systems,* Doctoral Dissertation, University of Mionnesota, Dissertation Abstracts International, 71-78, 741, 576A

Paul H. Hoch and Joseph Zubin (eds) 1958: *Psychopathology of Communication,* New York/London, Grune & Stratton

Robert P. Hawkins, John Wieman and Suzanne Pinger (1988): *Advancing Communication Science; Merging Maas and Interpersonal Processes,*

G.P. Huber: "Organizational Learning; The Contributing Process and the Literature" , in *Organizational Science,* Vol 2, No1, 1991

Bo Hedberg: "How Organizations Learn and Unlearn", in Paul C. Nyström and William H. Starbuch (eds) 1991: *Handbook of Organizational Design,* Offord University Press

J. David Johnson (1994): *Information Seeking and Organizational Information Fields,* A Paper Presented to the Organizational Communication Division of the International Communication Association, Annual Convention, Sydney, July 1994

Orrin E. Klapp (1982): "Meaning Lag in the Information Society", in *Journal of Communication,* 32(2):56-66

Myran W. Kreuger (1983): *Artificial Reality,* Addison-Wesley Publishing Inc.

Marshall McLuhan (1966): *Understanding Media,* New York, McGraw-Hill Book Compnay

Marshall McLuhan and Bruce R. Powers (1989):*The Global Village,* New York, University Press

Barry Maude (1977): *Communication at Work,* Business Book

James Martin (1977): *Future Developments of Telecommunications",* Prentice-hall Inc.

James Miller (1978): *Living Systems,* New York, McGrow-Hill

Barrington Nevitt (1985). *Keeping Ahead of Economic Panic,* Quebeck, Canada, Libraire Renouf Ltd

Ralph Nichols and L. Stevens (1957):*Are You Listening? New York, McGraw-Hill*

Ralph Nichols: "Manipulation versus Persuasion", in *Journal of the International Listening Association,* Volume 1, No 1, Spring 1987, pp-15-28

Stuart Oskamp and Shirley Spacapan (eds) 1990: *People's Reactions to Technology,* London, Sage Publications

E. Norman pearson (1990): *Space, Time and Self,* USA, Quest Book

Thomas J. Peters and Robert H. Waterman Jr. (1982): *In Search of Ecxellence ,* New York, Harper and Row Publishers

Karl R. Popper and John C. Eccles (1981): *The Self and Its Brain,* Berlin, Springer International

A.S. Pressman (1970): *Electromagnetic Fields of Life,* New York and London, Plenum Press

Karl Pribram (1971): *Languages of the Brain,* Eaglewood Cliffs Nj, Prentice-Hall

Ronald E. Rice and Associates (1984): *The New Media - Communication, Research and Technology,* Sage Publications

Charles Roberts and Larry Vinson: "An Investigation of the Effects of Presentation and Response Media on Listening Test Scores" in *Journal of the International Listening Association,* Vol 7, 1993, pp-54-73

Bernard Rosenblatt, T. Richard Cheatham and James T. Watt (1977): *Communication in Business ,* Eanglewood Cliffs, Prentice-Hall

Theodore Roszak (1986): *The Cult of Information,* New York, Pantheon Books

Brent D. Ruben and John Y. Kim (1975): *General Systems Theory and Human Communication,* Rochelle Park, New Jersey, Hayden Book Company Inc.

Philip Salem (1994): *Locating Social Cues; A Research Agenda,* A Paper Presented at the Information Systems Division of the International Communication Association, July 15, 1994

Lyman K. Steil, Larry L. Barker and Kittie W, Watson (1983): *Effective Listening ,* McGraw-Hill Publishing Company

J. Schmitz: *"Electronic Messaging: Systems Use in Local Governments",* a paper presented at the meeting of International Communication Association, Montreal 1987

Diana Corley Schnapp: "The Effects of Channel on Assigning Meaning in the Listening Process", in *Journal of the International Listening Association,* Vol 5, 1991

Michael Schrage (1990): *Shared Minds- The New Technologies of Collaboration,* Nes York, Random House

R. Tricker: "The Impact of Information Systems on Organizational Thinking", in *Information Processing 1977; proceedings of the 1977 International Federation of Information processing Congress",* edited by B. Gilchrist, New York, North Holland, 1977, pp 213-221

Harold Wilensky (1967): *Organizational Intelligence,* New York/London, Basic Books Inc. Publishers

Raymond Williams (1974): *Television-Technology and Cultural Form,* London, Fontana/Collins

Fredrick Williams (1983): *The Communication Revolution,* New York, A Mentor Book, New American Library

Andrew Wolvin and Carolyn Gwynn Coakley (1992): *Listening,* Fourth Edition Dubuque,Wm.C.Brown Publishers