COMMUNICATION ANALYSIS OF INFORMATION COMPLEXES

Dr. M. F. Malik
Department of Communication Arts
Concordia University
7141 Sherbrooke St. West
Montréal, P.Q. H4B 1R6

ABSTRACT

Communication Analysis is a tool for perceptual assessment of existing or projected information complexes. As information complex is an established reality, perceived by one or many humans, it could be of a physical nature, such as a building, landscape, city street; or of a pure informational nature, such as a film, television program, photographic picture, painting, or sculpture.

Analysis takes into account the physical, formal, and behavioural properties of information complex, and searches for scientific data, determining the information impact of it.

References are made to the exhibition and display design field, production of films and television programs, and urban planning with the use of communication analysis method.

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Preface:

During our daily life great amounts of information are detected by our senses, processed and stored in our brains. These details are not perceived in isolation, one by one, but in groups or bunches with certain preference, hierarchy of some information over other. Certain groups of information are perceived as entities, others as patterns, others as mosaics. Some groups of information have their own complexities - own space, time, structure, and their reflections in our sensoric and mental processing system. They are carriers of many different messages or contents, depending on our past experiences, cultural or anthropological background, and the capacities of our mind. This is the reason why relatively similar information structure has several different names, codes, or expressions. Also, they are happening in vastly different time segments: some information groups passing our senses within the range of seconds, and others happening over the centuries.

I would like to deal with information groups which have one common characteristic - they are perceived by humans and, sometimes, fully or partially created by them and for them. There are other information groups or complexes perceivable partially or fully only by animals, or some only by simple living cells, or some information complexes characteristic for the catalythic processes in the anorganic matter. I call them information complexes because individual information in them could be very different by form or matter, perceived by different senses in different time segments.

Communication analysis is a tool for research into the structure, form and behaviour of those complexes. It is based on the merge of certain aspects of system theory and cybernetics. It is examining individual information within the group, their connection, influence of one upon the other, and possible impact of group on human sensory systems. It could be used as thinking, recording or evaluative method in the design, media industry, education or science of arts.

1. INFORMATION COMPLEX

Information complex means usually a piece of reality which serves predominantly to the perception or sensoric interaction between humans. Pure information complexes are, for example, cinema theatre, arena, or screen of the television set, where no other function except information delivery is occurring therein. There are many other information complexes where the perceptual and functional aspect is merged, as in a museum where conservational aspect is connected with perceptual, exhibitional one, or in a city street, where function of public life is merged with showcase aspects.

Functional, Utilitarian complexes have certain specified social, economical or biological functions, such as a bank, shopping center, or a town hall, with certain informational aspects attached thereto. The advertising industry is using this merge of informational and functional characteristics.

Meta-Complexes are those lacking in reality environment, and occurring exclusively within the frame of human mind, i.e. dreams, associations. These complexes could freely combine reality aspect with irrealistic information and are highly individualistic in structure and contents. As a rule each information complex consists of:

1. Physical phenomena
2. Formal phenomena
3. Behavioural phenomena

Physical Phenomena are those constituting the static, material portions of information. Some information complexes are predominantly found on physical phenomena (building, landscape, sculpture). Other information complexes may have physical phenomena very limited in matter and unattached in the view of information structure (magnetic and plastic base of videotape is not connected too much to the content of television program; or the same film could be screened on many different projectors). There are primary and substituted physical phenomena: primary are those perceived directly by the consumer of information (sculpture viewed by a visitor to a gallery), substituted are those transmitted via other humans, or human-machine interaction (such as a camera shot of sculpture in television news program about the gallery).

Formal Phenomena are those which influence directly perceptual process and manner in which the information complex is perceived. They are corresponding to the human sensoric information channels: visual, audio, tactile, with predominance of visual formal phenomena, where the largest quantity of information input occurs. They determine the style, mood, climax of certain content or message. Some information complexes are found in formal phenomena (painted or photographed picture, musical piece), and much of artistic originality is based upon them.

Behavioural Phenomena are those which refer to the process of communication, or syntax of information complex, with main emphasis on human interaction. They correspond to the human motoric or expressive activities, either of perceiver or of performer. Some information complexes are based, in their information impact, solely on them (for example, a theatre play, a live concert, or a sports event in an arena); for others behavioural phenomena add the substantial component during the actual performance.

Each information complex is basically a carrier of various contents and messages. It has characteristic of chain, with three major components:

1. Information Source
2. Transmission Environment
3. Responding Receiver(s)

For a long time it was believed that the information source (building, street, picture, film, television program) contains all the content and messages fixed in pictures, words, views, sounds, and that is exactly what the audiences or viewers perceive. Now we know that information carries only parts of information content capable to start catalytic processes in human brains. Information sources could range from natural or even accidental (a view into the country, stone, cloud) to the fully artificially created (a painting, city, dance).

Transmission Environment (reader's room, cinema theatre, television set, exhibition space) was believed to be the only set of given passive conditions for the best undistorted transmission of information source content and messages to the receiver or destination. This is the prevailing case when information complex is performed and perceived in one time period. The situation could be reversed when transmission mode is repeated many times, and starts to create certain norms - perceptual stereotypes. Stimulation of similar ways of information complex perception could change substantially the content of information or distort it. Most of those distortions are not understood or perceived by audiences, and could range from subliminal perceptual changes to the creation of archetypes.

Responding Receiver (viewers, audience of theatre play or concert, visitor to a museum or gallery, pedestrian on city street) was believed to be a consumer of information source content and message. This is far from true. Quantity and structure of information source is very different from information perceived and retained by the human mind. Usually only a small part of the information source content is actually processed in the brain, and a still smaller part is retained in human memory. The extraordinary power of the human mind to reprocess, enhance and restore the parts of information content is giving way to the endless variation on a given theme - the previously delivered information source content in broad framework of story, views or time succession of event.

Time element is playing an immensely important part in any information complex. This seems to be absurd in the case of a building or countryside, where minor changes occur in many years, but pertinent in the case of television programs or films with precisely edited information sequences.

In all cases there are two time axis in each information complex. Horizontal time ax refers to the time elapsing forward (in the case of a television program aired in a certain time to an audience perceiving it), or backward (in the case of a viewer's recall of a visit to a gallery, or subsequent action, based on the perception of information complex).

Vertical time ax refers to the density of information in given time unit.

In the view of time structure of information complex, we could distinguish between unprogrammed, partically programmed, and fully programmed information complexes.

Unprogrammed information complex is such where the receiver is determining the time pace of perception, and in many cases the succession of the perceived parts of information complex (a walk in the forest, a visit to a natural or historical monument, a walk along a city street, or a trip to the country by car).

Partially programmed information complex is such where the receiver must follow loosely some guide, skeleton or succession of events, but has ample time to make deviation, stops, reverses, or detailed observations (reading a book, a walk in a museum or gallery, observation of birds or wildlife, sightseeing tour in a city or castle).

Fully programmed information complex is such where receiver must follow a prescribed succession of information units, otherwise risks the loss of content or messages (film, television program, concert, sport event in arena).

Performance of information complexes could be permanent or timed. Permanent performance usually works with few physical or formal parameters, exceeding usually the limits of usual human environments (Grand Canyon Viewpoint). Timed performance is working usually with many different parameters of information units, and has specific syntax, connections between them (story of A. Christie novel).

Parameters of information units, delivered in one time segment, are creating information load. This amount of information should correspond with physiological and mental capabilities of human sensory input otherwise the information from source of complex is not delivered, or delivered in fractions. Information overload - human ability to work with information overload is remarkable, the most visible in the handling of information patterns and information stresses.

Within the time frame of information complex seen from the receiver's side we could witness information complex impact (quantity of catalytic changes in human neural system after the reception of information from complex).

2. COMMUNICATION ANALYSIS:

Communication Analysis means systematic examination of factors playing a role in structures, detection, processing and storing information units in human memory during the communication process, or shortly thereafter. It is a thinking and data recording process which precedes design, script-writing or production, program research in media, architecture, commercial arts or education media production. Usually it is done by the manager of a team or the producer, in some cases by a designer or graphic artist, and results in the compilation of a production manual. It can be used in any phase of the media production process by the script-writer, director, cameraman, set-designer, or any other member of the creative team. With minor deviation, similar manuals can be useful for theatrical production, or any exhibition or large display.

It consists of three parts:

1. Global Space Orientation - is most useful for the physical assessment of information complex. In media industry this could be perceived as film or television location or studio set; in architecture feasibility location study; in exhibition and display industry it could be associated with thematic plan and synopsis. The designers, set-designers, or architects will probably need it the most.

2. Formal Parts - are most useful for the execution, building or assessing of the sensoric units of information complex. This preparatory work is assisting in the execution of pictures and sounds in building stylistic expressions, in evaluation of aesthetic impact of the countryside or an histroical monument. It will be used by the cameraman, art director, painter or composer.

3. Behaviour Phenomena - encompasses the human perception of information complex and the human use of it. It will be most useful for the manager of an information complex, interpretative services, guides, directors, or actors.

There are a number of specific parameters recorded in each part of the work:

A. Global Space Orientation:

In this area all aspects belonging to the physical properties of the information complex are expressed in the shortest communicative terms and codes (feet, sketches, floor and axonometric plans, physical units of light, sound, color, surface).

It is useful for:
- the architect in the conceptual planning of information complex
- the environmentalist in the physical assessment of information complex impact on surrounding environment
- the designer of display in the general plan of exhibition
- the set-designer in decor and set construction (in film and television production).

It is useful for - the director for the planning of actor's action (in film, television, theatre).
- the script-writer in the conceiving of the story skeleton
- the cameramen for the selection of tools, equipment and materials.

In general, there are three different space orientations for:

I - exterior
II - interior
III - environment of both

I. In the exterior of information complex the following parameters are important:

(1) The size of information complex, viewed toward the proportions, in which the complex will be perceived by humans. In this aspect any media conversions or distortion will have profound effect.

(2) The geometry of information complex, viewed from two different aspects:

- constructional geometry - pertinent for architectural, statistical and placement decisions
- perceptual geometry - conveying the "audience view" of information complex, important for the "association" or "involvement" aspect of the receivers, viewers.

(3) The physical parts of the exterior:

- constructional details (blocks, windows, corners, pathways) pertinent for routing of action, crews, acting cast
- perceptual details (shadows, light and colour patches, lines or contours, curves and shapes) which will be significant composition marks influencing the style of information complex. These details can complement or even change the logistic or semantic content of information complex.

(4) The axonometries (angular, perspective views of location) are important for conveying the feelings of depth, distance and directions. Vectors of space are most important for those who will be directing any human action within information complex (film or theatre directors, or television floor directors).

(5) The surfaces (texture, colour, light, sound) expressed in physical units will be determining correlation of reality within information complex with any artificial extension of it, or media conversion of it (in studio set).

II. In the Interior of information complex the following parameters are important:

(1) Interior structure and shape - these will determine later the viewer's orientation within the complex. In media conversions it will shape the scenes, actor's action, and eventually the needs of the director of cameramen to distort, enlarge, or compress, the space of location or studio set.

(2) Interior space: There are three main "spaces" in every interior, from which the receiver gets his/her information units.

- functional space - where receiver is moving himself (in a gallery, exhibition, museum), or where, in media production, actors or cameras are being moved.

- informational space - what people are looking at (showcases and their contents in a museum, pictures in a gallery, exhibits in displays, shop window displays on the street) or in media production - what we are scanning with the camera in descriptive shots.

- complementary space - remaining space in the interior, usually referred to as "background". Floors, walls, ceilings and far corners usually fall into this category.

The main measures vary in each category of interior space:

for functional space - human size, angles and time are the main measure rules. Any distortion from this natural rule will influence receivers, audience, considerably. Usually pathways through this space become space axis for the information flow either directly for receiver, or for actor's movement. Numbers of measures, proportions, and vectors of axis express much more exactly the information parameters, as vague terms of verbal description (film in film and television scripts) like "big", "small", "overwhelming", "narrow".

for information space - things, items size, angles and time are the main measures. There could be either free correlation of things and human beings, pieces of interior, angles - or this correlation could be set up in exact proportion. Usually the human eye and ear sets the boundaries quickly within which they are proportionally perceiving the things in the interior. But startling information impact could happen whenever the boundaries between functional and informational space are crossed (viewer's switch of attention from details in museum showcase to the big sculpture in the centre of exhibition room, or camera zoom from a piece of jewellery to the face of an actor).

for complementary space-prevailing contrast, brightness or colour are the measures of this space category. Usually such information units help to establish the overall climax, mood of the space, or support (distract) from the main semantic impact of informational space.

III. In the Environment the following parameters are important:

(1) The position of information complex toward larger entity (town, landmark, country). Usually this statement serves as the basic orientation reference (in media production we refer to the "establishing shot" or "teaser" in commentary).

(2) The spacial neighbours determine for receivers, future audiences, how far and how fast they will identify the information complex with their previous experience. Usually projection of proportions between various spaces, described in exterior and interior of information complex, will determine the identification time and power.

(3) The timing of environment is the average time in which most people are able to discover, examine and view information complex. The time of discovery must be connected with plans and angular views. Audio information units are coming in this connection as secondary or inclusive (in film and television scripts we encounter this factor described by words like "first view", "exposition", "first glance").

B. FORMAL PHENOMENA:

This is an area where a search into the style and form of information complex could be made. Exploration of these phenomena is most important for artists who will be creating various parts of information complex, or persons who are responsible for artistic, aesthetic impact of information complex. Especially, these parameters are important for:

- designers and graphics of exhibitions and displays
- cameramen and art directors in film and television production
- interpretative services persons in museums, galleries and national parks
- environmental urbanists
- advertising firms and agencies

For practical reasons information complex is analysed in small parts, units - each showcase separately, each exhibit separately, each camera shot or television sequence separately. There are few indispensable categories in this area:

(1) 3D Objects: These are spacial objects within the unit of information complex. It could be an exhibit in a museum showcase, or maquette in advertising display, or prop in the studio set of a television program. The data regarding numbers of items, sizes, positions, arrangements, surface colours and background contrasts are pertinent. Usually those data are expressed within the given time in which they are appearing before the audience (segment of museum tour, or notation on the shot sheet on floor plan of film studio). It should be also estimated the time necessary for observation of those objects as they may consume large time segments of the viewer's attention, and could substantially influence the content of information when combined with low cinetic action level of actors.

(2) 2D Objects: These are mostly substituted spaces or codes. Pictures hanging on the walls, photographic images in galleries, supporting graphics in exhibition, verbal captions fall into this category. Special care should be taken with all pictures, graphics or words if they demand significantly different perceptual time than the remaining space, or if they are demanding meta-processing (thinking) time. They can steal or obsess the major information elements of whole space, image; contrast with the space composition and axis; change the mood or time preceding the actor's action. Perceptual and processing time is most important parameter, as well as size, position, arrangement, lighting and surface colours.

(3) Audio Parts: These are mostly messages, coded in words and pronounced as commentary (to the gallery, exhibition or musuem displays), or dialogue (in films and television programs). Usually they are analysed logistically according to the common meaning of words and sentences. But from the point of communication analysis structural semantic analysis of text give more precise insight into the possible information impact, and audiospectrographic analysis is a good tool for spoken messages.

(4) Climaxes: These are possible prevalent colour, lights and sounds, appearing within the information complex. Usually if a certain spectral range occupies more than one third of the visual field it is perceived as prevalent colour. Sound prevalence needs at least fifty percent of intensity and spectra of human ear. In the area of light we can differ prevalence in contrasts, brightness and directions, all of which could change the prevalence of colours.
These parts usually influence the moods and impressions of audience about the information complex. They are more important in cases of steep information density, and they are major guides in cases of information overload and information skimming.

C. BEHAVIOURAL PHENOMENA

This is the area of search into the average matrixes of human behaviour if the information complex is perceived or lived by receivers, audience. Therefore the following parameters are most important for:

- exhibition directors and display managers
- script-writers in film and television area
- theatre, film, television directors
- actors
- editors and switchers in film and television industry

Behaviour phenomena could influence information complex either very early, before its creation, or very late, after the information complex is finished and perceived by audiences. It can guide scenario (of exhibition, film, television program) writing or decoupage, blocking of shots in scene (mise en scene), or influence the time and number of theatre and studio rehearsals, or could measure, to a certain extent, the information impact of exhibition, film or television program.

There are two groups of behavioural phenomena parameters:

- behaviour of the information source
- behaviour of the receiver

(1) The behaviour of the information source - is the quantitative search into the "story" of the location, building, park, street. It is time and space notated within the time of observation, or the time of the story.

The most important parameters are: the structure of program, or succession of small events within the information complex or story; program parts, their formal, functional, cinetic and human characteristics. All these factors could influence significantly the operation of information complex (behaviour of salesmen in shopping centres, behaviour of guides in a museum or natural park, behaviour, action and gestures of actors in film or television program). These factors could significantly enhance or detour the progression of the story, influence the casting, and determine to a large degree the cognitive and comprehension processes going on in audiences.

(2) The behaviour of receivers - is a quantitative search into the perception process the audience is undergoing through the observation of information complex. It is done as detailed notation of external activities of receivers (exhibition or gallery visitors, viewers) cued to the particular parts of information complex. Time, directions, succession of observation activities are major guides for the receiver's behavioural pattern. If the information complex has limited or non-visible behavioural effects (such as a viewer sitting before a television set, or cinema-theatre visitor) direct extraction of psychophysiological data is giving more precise answers than traditional psychological tools (questionnaires, interviews, recall studies).

The last part of communication analysis is using data of all three preceding studies (physical, formal and behavioural phenomena) and is studying the time structure of information complex, or succession of information unit, when they are perceived by people, visitors, receivers.

The time pattern of an information complex is extremely useful to those persons who are determining the time slots, fields or sequences. It is most important in cases of steep information cascades, as in radio, film and television programs, and some cases of fully programmed exhibition or theatre plays.

Therefore, the following data is most useful for:

- exhibition and display programmers
- editors or switchers in film and television industry
- conductors of orchestras
- partially to the directors and cameramen in cases of direct decoupages or camera editing on locations

The following parameters are important:

(1) Visual Fields:

When an ordinary person goes through the space of information complex, sees a film or television shot, explores an exhibition room or landscape, he/she is dividing the perceptual time into space sequences or angular views. These could be distant views, immediate surrounding views or various detailed visual explorations. In the case of receiver-visitor walking through space there is great liberty for the person to select his/her own angular views from the pathway. In the case of fully programmed information complex, these angular views are determined by authors of information complex (in film or television: camera shots, Long Shot--LS, Medium Shot--MS, Detailed Shot--DS or LDS). Within each visual field there could be a varying degree of cinetism, either in axonometric movements, or intrinsic movements.

The number, nature and succession of natural visual fields (those taken in liberty by viewer) could help substantially for editing/switching pattern in the programming of information complex.

(2) Audio Fields:

In addition to the logistic audio fields (speech, commentary, dialogues) the receivers could encounter several, or many, spaces, where particular sound could be heard within the information complex. Besides sound being complementary to the visual field, it could have its own distinguished meaning, information space and time. Parameters of number, geometry, intensity and spectrum of audio fields are important for sound direction and reproduction. In the cases of recorded music, concert or stereophonic reproduction, audio fields are immensely important.

(3) Other Sensoric Fields:

Spaces where distinguished smell or taste could be encountered, or where certain specific information from touching and vibrations could be felt, are considered the sensoric field. Usually it is bringing only additional information to the main visual and audio information channel. But in certain cases it could enhance or carry its own information unit. Unconventional exhibition and theatre styles (polyecran, cinesphere, Laterna Magica) unconventional film and television techniques (cinesphere, cinetarium, 3D television) are working with major input in those sensoric areas.

The form of the data recording uses time notation, harmonograph techniques, or various electromechanical or eletronical programmers, where data is recorded on magnetic tape in digital or analogue modes.

III. UTILIZATION

Communication Analysis of information complexes is used currently in architecture by urbanists and environmentalists, in museums and gallery displays, in film and television industry, and in theatre productions. Among projects using this method in the past years were:

Structures of Human Settlements - architectural research
University of Manitoba, Canada

Noricama - programmed exhibition
Germany

Grierson - film
National Film Board, Canada

Polecran - exhibition
Bruxelles, Belgium

Polyvision - exhibition
Montreal, Canada

Cinesphere - film
Toronto, Canada

IV. APPENDIX

1. Keys for Communication Analysis - Information Complex

2. Communication Analysis of Film

3. Communication Analysis of Photographic Picture

4. Communication Analysis of Painted Picture

V. LITERATURE

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VI. OTHER SOURCES

Library of approximately 200 cases of various Communication Analysis of films, pictures, buildings, parks, city segements, etc., is stored at Concordia University, Loyola Campus, Department of Communication Arts, Montreal, Canada.