# SYSTEMS APPROACH TO ADVERTISING CONTROL

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## ABSTRACT

This paper was written to investigate whether or not systems theory could be usefully applied to the control of advertising programs in business. A theoretical framework integrating systems, mass communication and advertising was developed and then applied to an existing real-estate marketing firm. It was concluded that the systems approach can be useful in a practical situation but a great deal of work remains to be done in this area. The paper closes with a number of suggestions for future research.

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#### INTRODUCTION

The topic of this thesis is systems, mass communication and advertising. The task it hopes to accomplish is the integration of these three areas into a framework which can be usefully applied in a practical situation. The choice of the topic was the result of the author's desire to read in the field of advertising and mass communication and also a result of the suggestion of his thesis advisor that melding systems theory with the other two areas might prove fruitful.

The three subjects are under considerable scrutiny at the moment with Marshall McLuhan at the height of his popularity, Vance Packard selling as well as usual and the marketing journals (King, 1969, p. 84; Stasch, 1969, p. 12) featuring numerous articles on systems analysis.

One of the difficulties with writing on such a subject is that volumes have been written on each one yet little has been done on the integration of the three. The result of this scarcity is that one must take an eclectic approach and pick and choose without a thorough knowledge of what is available. It is expected that not everyone will agree to the choice of references but at least, where possible, they are current.

The purpose of the paper is to see if the theory could be applied in practice as:

...theory without factual content offers little promise of practical application. Accumulation of fact without theoretical structure is an uncertain foundation for an advancing knowledge and mastery of a field. (Alderson, 1957, p. 7)

The development of the paper moves through the general case of systems analysis, then begins to apply the concepts to mass communication and finally refines them to the case of advertising and the control system. The last chapter presents a specific example of how the theory might be applied in business. The information employed there is the result of two days of interviews with company management regarding their advertising practices. This data was supplied quite freely as the author will be employed with the company with initial responsibility for advertising and promotion. In the final paragraphs, some conclusions are drawn and some suggestions for future research are enumerated. The paper begins with a discussion of general systems theory.

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#### CHAPTER I

## GENERAL SYSTEMS THEORY

The relative infancy of systems theory as a body of knowledge has resulted in terminology which is used by many and understood by few. Since much of this paper concerns communication, it is appropriate that we establish some common meaning for various concepts. With this mutually understood shorthand we should be able to set up a general theoretical framework which can be expanded to apply to our particular case of advertising systems.

One of the main problems of contemporary systems literature is that terms take on different meanings and emphasis depending on which discipline the author is discussing. In many cases, individuals within the same discipline do not always agree on what constitutes the "systems approach". On one hand, the exposition is couched more in the language of the physical sciences and emphasizes cybernetics and models such as servo-mechanisms, whereas at the other end of the scale, the social scientists stress group phenomena, ecology, status and role expectations. Other perspectives besides the physical or behavioural also exist. The internal relationships of the system's parts are investigated or the relation of the system to its environment or both facets at once. In short:

...the system concept has emerged as a most democratic institution which is used by all regardless of race, colour, creed, credibility ...Like so many things held in common it is abused by all, maintained by none. A public horse gated to everyman by indiscriminacy the system concept has become docile but dull, tractable but thoroughly insipid. (Sutherland, 1969, p. 4)

Having found everyone guilty of bias and ecclecticism, we are about

to commit the same crime, but the message is this; the "systems approach" means many things to many people and, therefore, before one can employ the specialized terminology it must be defined. The choice of definitions and point of emphasis may not be approved by all, but in order for the paper to be meaningful, a framework must be selected and adhered to as much as possible. To choose an approach, one central question must be answered. What dimensions are important for our analytical purposes? Since we will ultimately be concerned with the administration and control of an advertising program in a marketing environment, an ideal viewpoint would be to concentrate on general systems in terms of their managerial tractability. Fortunately, such a classification exists.

One socio-economist (Dr. J. Sutherland of U.B.C.) is currently (Spring, 1969) writing a book entitled <u>Socio-Economic Systems Analyses</u> which adopts the point of view of the administrator and the analyst. Much of the following discussion stems from his work. The central concept in Sutherland's theory is his "prime dimension", reflecting system manageability, ranging from the <u>mechanistic</u> (deterministic) system, which is a simple, predictable, easily managed entity, to the <u>gestalt</u> (probabilistic system) which is a highly complex, uncertain administrative nightmare. This prime dimension is in turn the resultant of three basic system characteristics, its <u>ecology</u>, its <u>domain</u>, and its <u>dynamics</u>. Each of these will be examined in some detail.

The <u>ecological</u> dimension of a system refers to how it relates to its environment--the "interfaces" of the system that we can see from observing it from the outside. It is "...the external configuration of the system." (Sutherland, 1969, p. 13) If the system has little or no interaction with

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the environment then it is <u>closed</u>. If there is a great deal of interaction with the surroundings the system is <u>open</u>. Since marketing, and consequently advertising, interact extensively with the environment, we will concentrate on these open systems, recognizing that the closed system has essentially the opposite characteristics.

If an entity is to exchange resources, energy or information with its surroundings, interfaces or channels of communication must exist which carry this interchange. Through these interfaces, an open system communes with its environment and can, therefore, adapt to changing external conditions. If the external field is very stable and predictable, the ecological state of the system will be relatively steady. However, if the system occupies space in a highly complex, rapidly changing milieu, prediction of the systems behaviour will be extremely difficult as the "...cause and effect relationships are confounded by the positive probability that the origin or destination of actions which affect the system (or are effected by it) lie outside..." (Sutherland, 1969, p. 25) the system itself. From the administrative or control point of view then, since it is usually difficult or impossible to control the environment (eg. the social attitudes of a firm's customers) administration and prediction of an open systems behaviour is probabilistic at best. In summary, the ecological dimension of a system can be scaled on a continuum ranging from closed at one extreme to open at the other. The open entity has three main characteristics:

- (1) it exchanges resources with its environment,
- (2) it adapts to its environment,
- (3) it may be predictable to only a very low level of accuracy

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depending on the stability of the environment.

(Sutherland, 1969, p. 27)

With very little effort, it is possible to see some of the implications these characteristics have for control and administration. These will be investigated in conjunction with developing an advertising control program. in later pages.

The second basic measurement in Sutherland's analysis is the domain dimension. The domain is the space that the system occupies in the environ-If the environment is outside the system, the domain describes all ment. that is within--it can be analogized to a map showing the area, or geographical boundary as well as the location and the relationship of the systems elements. In an open system it is the feature which adapts to and changes with the surroundings. The domain dimension can be placed on a continuum from one in which it is easy to analyze and identify spatial relationships, to the complex entity, where the nature of unobservable portions or elements must be inferred from that which can be empirically analyzed. For example, media audiences of advertising are not totally observable by the analyst and their reactions must be inferred from a sample of those audiences--yet all the message receivers are part of the advertising system's domain. Because of cost, one hundred percent inspection cannot be carried out on all parts of the system and the reactions of the whole must be inferred from the sample. To the extent that the elements in a system are homogeneous, (eg. one market segment) the probability of predicting the behaviour of the universe from the behaviour of the sample will increase. Also, if the elements in the domain are symmetrical (eg. reactions correlated to age) the predictive accuracy will be improved. In

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other words, from the point of view of the administrator, the more the domain is observable, homogeneous and symmetrical, the closer will predicted behaviour approximate actual behaviour and conversely, the more unobservable, heterogeneous, and asymmetrical the domain, the greater will be the discrepancy between forecast and actual behaviour. The domain of an advertising system would obviously lie closest to the latter situation.

The last major characteristic of a system is the <u>dynamic</u> dimension which introduces a time factor into the theory.

The dynamic analysis of a system is concerned with what happens between successive snap-shots of a given domain...the structural changes which have taken place between time  $-t_1$ , and time  $-t_2$ , for a given system. (Sutherland, 1969, p. 43)

If the interval between time  $-t_1$ , and  $-t_2$  is relatively short, yet the changes that have occurred are significant, then frequent measurements or analyses will have to be undertaken if the cause and effect relationships are to be understood. Knowledge on the manner in which the system changes over time is important as:

...the <u>control</u> task demands knowledge about when, where, and how to intervene in the systems dynamics so as to stimulate lagging operations, dampen accelerating operations, or otherwise regulate the subject system's actions and reactions. (Sutherland, 1969, p. 48)

The changes in a system can come from its internal operation or from external sources. A system is a group of elements which behave in some manner to achieve a goal and in the course of this action there must be different system states. Presumably in a closed system there would be defined limits as to the amount and rate of change. In an open system however, there will be changes caused by variations in the environment. Here the rate and magnitude of change is only limited by the systems ability to adapt.

For both internal and external causes of changes, any periodic

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fluctuations or regular behaviour patterns will make the system outputs easier to predict and consequently control. The dynamic dimension thus reflects the nature of change, from the almost static system, to one exhibiting rapid, random fluctuations.

In summary, we have three scales measuring different system characteristics in terms of their administrative complexity (See Table I.) The basic or prime dimension is really a resultant of the three system characteristics. Clearly the closer a system can be represented by a mechanism, the easier it will be to control. The objective of most administrators then would be to move their system as close as possible towards the mechanistic entity.

The above analysis has been based almost exclusively on Sutherland's theoretical framework. My abbreviated paraphrase has hopefully pointed out some facets which are important in terms of controlling and administering systems in general and this background will subsequently be used as a jumping off point for examining communication systems and advertising.

Before we leave the general discussion of systems, several specific points should be clarified, in particular, the various elements within a system, and the manner in which subsystems can be related. Since we have already been discussing a systems <u>environment</u> we will define it "...as a set of all objects, within some specific limit, that may conceivably have bearing upon the operation of the system." (Optner, 1965, p. 36) In describing the domain of a system, we discussed the position of elements within the area and this relationship of the components to the whole and to each other constitutes the <u>structure</u> of the system.

The components or elements of a system are the input, output,

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## TABLE I

## GENERAL SYSTEMS DIMENSIONS

Gestalt (Probabilistic)

- open system, adapts to and exchanges with

environment

- partially obscure,

heterogeneous asymmetrical

## Mechanism (Deterministic)

Ecological - closed system, no environmental exchange

Domain - observable, homogeneous symmetrical

Dynamic - very slow, predictable - rapid, complex, change irregular change

processor, control and feedback (See Figure 1). The input function provides

Fig. 1.-- General systems module



a means of getting into the system, for starting it going, its objective or initial energy. The <u>output</u> function represents the results of the systems operation--what is produced, consumer reactions and so on. Through <u>feedback</u>, the nature of the systems output is communicated back to the input function which

digests the information and makes appropriate changes in the inputs. The <u>processor</u> is the means whereby the inputs become outputs. "The processor element of the system under study must be deduced by observing the system output when known inputs have been injected." (Vest, 1966, p. 136) In studying a computer system, the computer is the processor; in studying a democratic government systems, the inputs i.e. the desires of the electorate (theoretically) are processed by the Government to produce output--legislation. In an advertising system the processor under study is by definition advertising.

The remaining element of systems is the <u>control</u> function. In a completely deterministic or mechanistic system, such as a thermostat, the output itself acts as the control mechanism when output becomes input through feedback and any necessary adjustments are made automatically. However, in a probabilistic system or gestalt "...one about which no precisely detailed prediction can be given", (Beer, 1960, p. 12) an additional control element must be imposed to make discretionary decisions based on a comparison of actual and desired results.

The environment is not an element of the system but it can influence open systems in two ways. The <u>deterministic</u> aspects of the milieu such as laws, ethics, and company financial resources, constrain the behaviour of the processor and govern the way in which it functions. If these factors change, the result is a new system. The <u>probabilistic</u> factors in the environment interfere with and distort the behaviour of the system and are consequantly termed "noise". Both aspects of the environment can be sources of system malfunction.

One major area remains to be mentioned--the division of systems into

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various levels or subunits. The classification of an entity as a system or a subsystem depends on the perspective of the analyst. If the universe is a system, the world is a subsystem. If a business firm is the system we are studying, then marketing is a subsystem as are production, finance and so on. In other words, the appellation depends on your point of view as subsystems are "...the component processes necessary to the operation of a total system...." (Optner, 1965, p. 36)

There are various ways in which subsystems can be structured in relation to each other and to the "total" system. Alderson (1957, pp. 75-78) identifies four interrelationships: seriality, parallelism, circularity, and centrality. In a serially structured system, the subsystems are arranged in a sequence so that the output of one becomes the input of the next. The parallel structured system allows two separate subsystems to operate independently of each other, although in some way the inputs and outputs must be related. In the marketing system, the mass media advertising subsystem and the personal selling subsystem would be examples of parallel structure. The third possible structure is circularity and refers to "...a sequence of steps arranged one after another, but in such a way that the process finally returns to the point from which it started." (Alderson, 1957, p. 77) Information-feedback systems would fall into this category. The last concept centrality implies systems meeting at a location and processing inputs in or out from that point. In a complex system of course, all of these structures may exist simultaneously depending on the level of analysis.

Vest (1966, p. 37) has commented on the position of subsystems in relation to the total system rather than to each other and classified the relationships into centralized or decentralized systems. In a centralized

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process, one major subsystem has a dominant role whereas in a decentralized system all major subsystems are of approximately equal value.

One further set of relationships is useful in examining subsystems. Optner (1965, p. 35) uses the following terms in a slightly different context but they can be beneficially applied to subsystem relationships. Subsystems may be (1) functionally necessary to each other (eg. product and pricing subsystems) (2) complementary to each other (eg. advertising and personal selling) or (3) redundant, where two subsystems perform essentially the same function or contradictory, when two subsystems are pursuing mutually exclusive goals. The third set of relationships should be eliminated from any administrative system except perhaps for "breakdown" insurance in the first instance and internal competition leading to overall system optimization in the second.

This concludes our discussion of general systems theory. We have identified two extreme system conditions for administration, the mechanism (i.e. deterministic system) and the gestalt (i.e. probabilistic system). We defined the environment external to the system, the elements within, and concluded by postulating various relationships between subsystems and the total system. With this background, we will now look at communication and advertising in a systems context.

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#### CHAPTER II

## COMMUNICATION THEORY

How can mass communication be viewed as a system? Can advertising as a special form of mass communication be examined in a similar light? The answer to these questions is a definite affirmative. To reach this conclusion it will be easiest if we start by looking at the simplest communication model. Borrowing heavily from Schramm's classic work, (Schramm, 1961, pp. 3-26) we will look initially at the process of face to face communication, elaborate this to mass communication and then in the next chapter refine the concepts in terms of mass media advertising.

In any communication there must be at least three major components, a sender, a receiver and a message. This is the most basic model and it has its systems parallel with input, processor and output. The analogy is not direct, as the communication model refers to <u>where</u> to behaviour is taking place (eg. in the sender) and the systems terminology refers to <u>what</u> is taking place (eg. input). Figure 2 makes the relationship more explicit.

# Fig. 2-- Comparison of models

Communication (where)

sender — — — message — — receiver

Systems (what)

input \_\_\_\_\_ processor \_\_\_\_\_ output

Keeping this difference in mind will help in understanding the following paragraphs as the communication framework is elaborated.

To reiterate, the basic communication model has a sender, a receiver and a message. For example, the husband who is cutting the grass feels the pangs of hunger--a physiological stimulus; this he translates or encodes into symbols in the form of words if he calls to his wife that he desires lunch. If she hears and translates or decodes his signals (words in this case), there has been communication. If she does not hear him, nothing has been communicated. If she decodes his message incorrectly and brings him a glass of water instead of a snack, the communication has been faulty. This model can be elaborated however, because from the reaction of the receiver, the sender receives feedback or information about the manner in which his message was decoded--it has not been interpreted as intended. The same feedback process is available to the receiver, who by answering or acting becomes a sender of a message and also receives feedback. In human communication then, the individual alternates between being a sender when he is talking and a receiver when he is listening. Diagramatically it could be represented as in Figure 3.



(adapted from Schramm, 1961, p. 8)

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Besides the feedback that the sender acquires from the destination, the sender or source also receives feedback from the message itself. When speaking to someone, you listen to ensure that you are talking at the right volume level; if you mispronounce a word you correct it. You, therefore, have two types of direct feedback--one from the message sent and one from the receiver. The previous diagram can be expanded as in Figure 4.



Fig. 4.-- Expanded face to face communication model

(adapted from Schramm, 1961, p. 9)

This information provides us with the basic format necessary to superimpose the systems concept onto the analysis.

Face to face communication may be analogized as two serially connected subsystems with interlocking feedback loops (see Figure 5) where the output of one subsystem (sender) is the input for the other (receiver). On the ecological dimension, we have an open system where inputs may come from external sources, such as environmental (probabilistic) cues or they may Fig. 5.-- Face to face communication system



come from within the system (eg. subsystem outputs). Whatever the stimulus, it is decoded as input in the <u>sender</u> subsystem and then processed or interpreted subject to the control mechanism. The information that has been interpreted is encoded as output in the form of a message. The <u>receiver</u> subsystem is also open and, therefore, besides the output of the sender subsystem, it may also receive input or noise from sources outside the communication system. These decoded inputs are then processed or interpreted and a response or output is encoded which is monitored as feedback for the total system. The individual feedback from each subsystem is, of course, the result of monitoring the respective outputs.

The variance between the message as encoded by the sender, and the resultant decoding by the receiver, can be caused by many factors. Since human communication is an open system, outside interference of "noise" may cause distortion. In addition, the environmental constraints on the processor may change, resulting in a new system. On the other hand, internal factors have a major influence on this divergence. Encoding implies the process of translating concepts or impulses into signals or symbols. For

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example the sender subsystem output that "This snow is cold", contains two basic symbols, standing in one case for a physical entity--snow, and in the other case for a physiological sensation--cold. For the message to be interpreted as intended, the symbols must have the same meaning for both the sender and the receiver. The word "cheap" may mean low-priced to a communicator but "worthless, shoddy" merchandise to his audience. Experience, culture and a host of other factors determine the relationship between symbols and their interpretation. The message must be encoded such that it is understood by both sender and receiver. You must know the background of your audience. In systems terminology, the processor elements in both subsystems must have been developed on common experience so that when the output of one becomes the input to the other, the manipulation of the symbols by the processor will produce the correct output or response.

In summary then, face to face communication can be regarded as two serially connected subsystems where the output of one is the input for the next. For the sender subsystem to produce the desired response in the receiver subsystem, the signal generated must have a common meaning to both entities.

When does communication become mass communication? Certainly a large heterogeneous audience is implied, but how large? A professor teaching a seminar group of four or five is involved in face to face communication. He would be reasonably certain as to how or if his message was accepted as he is receiving direct feedback from each person in the form of questions, comments, or yawns. However, that same professor lecturing to a class of two hundred is indulging in mass communication and relies on indirect feedback in the form of examinations and papers to judge the reception of his

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message. One of the delineating factors between types of communication is, therefore, the form of feedback. If it is direct, the communication is personal. If it is indirect, the communication is likely to be mass.

It is difficult to pinpoint the differences between mass and face to face communication. Part of the problem stems from a confusion over structure versus process. The <u>structure</u> of mass communication is usually employed in reference to the nature of the audience. The receiver subsystems are heterogeneous, spatially separated and, therefore, anonymous from the standpoint of the communicator.

The <u>process</u> of mass communication is concerned with how the system behaves and what interrelationships exist between subsystems. The indirect nature of the feedback is part of the processing aspect. Since the distinction in communication forms is only meaningful if it implies different approaches to control, that the most significant characteristic of "mass" communication is a very large audience. From this feature, both the processing and structural characteristics must follow.

How else does the mass communication process differ from the face to face situation? "Mass communication may be characterized as public, rapid, and transient." (Wright, 1965, p. 14) The mechanics of the process make it public as the senders output is aimed at a large heterogeneous audience which is personally unknown to the communicator. As a result, the type of feedback that is available is usually indirect and measured by proxy variables. For example, if a firm continually advertises that it has the best product and the lowest price, yet sales steadily decline, this sales volume trend will be taken as a sign that the communication is not producing the desired response (belief)--other things being equal. These types of

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secondary feedback levels are relied upon since mass communication "...is offered to an aggregation of individuals occupying a variety of positions with the society--persons of many ages, both sexes, many levels of education, from many geographic locations, and so on...." (Wright, 1965, p. 14) Thus direct feedback is impossible or at the least prohibitively expensive. Therefore, in advertising research for example, the responses of a few are used to infer the reaction of many.

Two other major characteristics of mass communication are its transient and rapid nature. First of all messages transmitted by mass media such as television, radio, newspapers, billboards and so on usually only last a relatively short time. The radio signal, once broadcast, will never be heard again unless it is repeated; the newspaper article, once read will likely not last longer than to the next garbage disposal. In contrast, other forms of communication may last centuries--plays by Shakespeare, art by Rembrandt, architecture by the Greeks and Romans and music by Mozart and Bach to name but a few.

As to mass communications rapidity, this really refers to the speed with which a message can be transmitted to a large number of people. With contemporary technology it is possible to broadcast to millions simultaneously, whereas to reach the same number of people effectively with face to face communication, would be almost impossible because of time restrictions, geographical barriers, high costs and probability for human error.

Mass communication is characterized by a large number of separate receiver subsystems, all processing the output of the sender (institutionalized communicator) at approximately the same time. The nature of

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the feedback is complicated by this multiplicity of receiver subsystems and introduction of the dynamic or time dimension further complicates the analysis. As each subsystem processes the communicator's output, there is feedback within the receiver subsystem (see Figure 6 -  $f_1$ ,  $f_2$ ,  $f_n$ ) as to

# Fig. 6.-- Mass communication system



- P = processor O = output
- F = feedback
- EC = environmental constraints N = noise A = administrator

the reaction (output) each produced. If there are other people available for discussion who may or may not have received the same message, the responses may be compared and revised thus producing feedback <u>between</u> received subsystems ( $f_{1,2...n}$ ). Eventually the aggregate reaction of the receiver(s) may be communicated in some manner back to the sender subsystem in the form of secondary or primary feedback ( $F_{+}$ ).

In this oversimplified diagram, the sender subsystem is for the moment, the same as in face to face communication. In the case of a radio broadcaster, he may have a number of mechanical aids and the message may be his own or one typed out for him to say, but the situation is basically the same.

The receiver subsystems need some clarification. Above it was mentioned that the individual receivers acquire feedback from some of the other audience subsystems. This may be the case, but not necessarily so. (Therefore the line is dotted) If an individual is alone when he receives a message, he may act on it immediately without any feedback from other people; he may not react until he has heard the same message many times; or he may not react at all. These latter three possibilities are a result of the nature of the human audience and today's mass communication environment. We have previously suggested that a message must be formulated in terms that have meaning for the audience but there are several other characteristics that a communication must have to be effective. Imagine yourself walking down the main street of a city and consider all the messages that are being presented to you--names of streets, traffic lights, neon signs, store displays, newspaper headlines, billboards and so on for an almost endless list. Even sitting in your living room, you have a choice between the radio,

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television, newspapers, magazines etc. Being more particular, in the newspaper you have a wide choice of articles or advertisements you can read. Some messages are received and some are not. For a specific sender's output to be processed in place of someone else's, the transmission should gain and hold the attention of the receiver. "The message must arouse personality needs in the destination and suggest some ways to meet those needs." (Schramm, 1961, p. 13) Furthermore, the signal should suggest some way to satisfy these needs which is suitable to the individual. The recommended behaviour must be acceptable to his way of life. Since there are far more messages being bombarded at man than he can possibly interpret, he exercises "selective perception" and only reacts to those messages which relate to his needs or desires. Therefore, in the formulation of the message, the nature of the audience must be known as explicitly as possible.

An additional peculiarity of the human audience is that one message may not be sufficient to cause a definite reaction--it is below the "activity threshold". This means that it may be the cumulative effect of processing a similar of identical series of messages which produces a response rather than just one particular transmission.

To reiterate some of the previous discussion, mass communication differs from face to face communication in the size of the audience and by the use of mass media which makes it public, rapid and transient and the feedback received is indirect. It can be viewed as a sender subsystem with a number of simultaneous, parallel receiver subsystems with interlocking feedback loops within and between systems. Because of the multitude of communication vying for the attention of the receiver(s), the message should relate to the personality of the destination if it is to be processed and it must be presented often enough to exceed the individuals "activity threshold".

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#### CHAPTER III

#### THE NATURE OF THE ADVERTISING SYSTEM

Advertising is a specific type of mass communication as are propaganda, entertainment, education and so on. They differ from each other mainly in terms of the institutions involved and the objective of the messages. In marketing, advertising has been variously defined as:

- ...the function responsible for persuasive communication. (Engel, Wales and Warshaw, 1967, p. 98)
- (2) Any paid form of nonpersonal presentation and promotion of ideas, goods, or services by an identified sponsor. (Kotler, 1967, p. 451)
- (3) ...a <u>communication</u> force. It should be assigned a communication task. Its job is to deliver a sales message--not just <u>expose</u> a message to people but to <u>deliver</u> a sales message that stimu-lates or ultimately leads to action. (Colley, 1965, p. 7)
- (4) ...mass <u>communication</u> of <u>information</u> intended to <u>persuade</u> buyers so as to <u>maximize dollar profits</u>. (Kirkpatrick, 1964, p. 33)

From these definitions of advertising, some of the characteristics of the system can be deduced. The goal is persuasive communication, paid for by an identified sponsor with the ultimate objective of increasing profits. In other words, there is a cost associated with not achieving the objective, implying that information which helps control the system's behaviour is of some benefit.

In the following paragraphs we will examine advertising in relation to the general systems theory. For the sake of clarity, an oversimplified system consisting of four major subsystems will be used (see Figure 7).





We are looking at the system from the viewpoint of the manufacturer who employs his own advertising department. The advertising director of the company is the control subsystem or the administrator and his function is to receive information on the audience reaction to the system's output, compare it with the desired output and make the decision as to whether the inputs should be changed. The advertising department processes the administrator's decisions into advertising scheduling and copy, which in turn is passed on to the media which transmits the commercials which are received and reacted to by the audience.

As stated, this system is extremely oversimplified. We will begin to relax some of the myriad assumptions as we examine the system's three basic dimensions--its ecology, domain, the dynamics.

Beginning with the system's relationship to its environment (the ecological measurement) it is obvious that advertising as a whole is not a closed system, although it is initially shown that way in Figure 7. Furthermore, each of the four subsystems is open to its milieu. The external influences on media for example, may be in the form of <u>deterministic</u> constraints such as the legal limitations on copy, areas of broadcast, or even products advertised. Other external factors may be <u>probabilistic</u>-such as thunderstorms, competing media changes, or the mood that the announcer may be in at the time he broadcasts the message. These latter probabilistic disturbances are what we call "noise", as they are a source of distortion in the message. Not only the media subsystem is subject to these external interferences. Our perspective views advertising as the total system, but from the viewpoint of marketing or the company as a whole, the advertising is a subsystem, subject to bombardment from competing demands, from other areas of the company. Achievement of the goals as seen by the advertising department may be in conflict with the goals of the company as a whole. The processing of the inputs into the department may be distorted because one of the members hopes to have his girlfriend do the commercial even though she may not have the proper "image". Once again, some of these factors would be deterministic and some probabilistic.

The audience is the most open subsystem of all. Millions of messages vie for attention with one another. A multitude of media choices are available and children, wives, mowing the grass, finishing the office report and playing golf all compete for the time and attention of these receiver subsystems.

The administrator is subject to many of these same influences. In an open system such as advertising, it is interesting to note the control subsystem <u>must</u> be open to environmental information if any of the other subsystems are open. This statement assumes a time dimension, such that as the environment changes, the system must adapt if it is to remain a viable entity. Also, since the output of an open system may be the result of factors which are external to the system (i.e. not just subsystem outputs), the control mechanism must be very flexible to account for an infinite number of reasons of system malfunction. It is this multiplicity of possible causes of output, that makes the open system so difficult to control. In a

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thermostat, where (barring mechanical failure) the only cause of faulty operation can be too little or too much heat, the control subsystem can be simple and closed because there is only a binary decision of heat on or off to bring the system back to its objective. A given output can have only an extremely limited number of correct responses. However, in an open system, a given output--e.g. a decline in "awareness", can be the result of new competition, weather, media difficulties, faulty encoding of the message and so on. This is why in a system at the open end of the ecological dimension, a "black box" approach is inadequate. This is in conflict with some opinions in cybernetics where one feeling is that:

...the methods we should use to handle exceedingly complex systems are those of input-manipulation, output-classification; they are <u>not</u> those of "cause-and-effect" analysis. (Beer, 1960, p. 52)

In the context of advertising in todays highly competitive environment and million dollar advertising budgets, one doubts that executives would be willing to "manipulate the inputs" without some attempt at understanding what goes on in the "black-box". A doctor who has a patient complaining of a pain in her stomach would do well to attempt some cause-and-effect analysis before removing the appendix, and part of the stomach and kidneys, only to find that loosening the woman's girdle removed the discomfort! This criticism may be slightly unfair where it is impossible to deduce any cause and effect relationship, or if the costs of the trial-and-error method are relatively small, but in many cases the "black box" approach is surely just a first step to cause-and-effect-analysis. In summary, when the system is on the open end of the ecological continuum, an open, control subsystem is necessary (assuming the environment is not static). The function of this subsystem is to take outputs and compare them to some desired results. On

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the basis of this comparison, some analysis, either formal or informal, will be undertaken and a decision made as to the appropriate inputs for the present system state. This is in contrast to the closed mechanistic system where a separate control subsystem is not really a necessity as the output of the system is also the input, and the processor acts as the control. Advertising, as an open communications system needs this separate control subsystem in the form of an administrator.

In terms of the domain dimension of the advertising system--what it looks like, the space it occupies, the position of the various elements or subsystems--the relationships between subsystems are probably the most important. Consider the structure in Figure 8.



Fig. 8.-- Advertising system structure

The manufacturer uses a number of parallel subsystems to project his message to potential customers, namely the various mass media. Each medium in turn is transmitting to an audience or a number of receiver subsystems. When a duration of time is introduced, the audiences for each of the media subsystems may overlap--resulting in the same receiver subsystem decoding the message from four or five different media. One of the advertising research's major goals is to equate the marginal returns of each of the media, and it is easy to see from the diagram why it is an extremely difficult task. Looking at Figure 8, the complexity of the system's domain can be visualized, especially if an agency subsystem were added along with separate geographic areas, with branch offices doing local advertising and possibly with commercials for 20 or 30 different products. When one also considers the absolute size of the mass audience and their anonymity and physical removal from the sender, the task of controlling such a system seems horrendous.

Two of the domain characteristics mentioned in Chapter I are employed to alleviate this complexity where possible. Any <u>symmetry</u> discovered in the systems domain is used to simplify analysis. For example, if it were known that usage of a certain product varied as a direct function of age, the response of a given audience to a purchase appeal may be inferred and inputs may be made or revised on this basis.

Another possible domain characteristic which is employed to simplify prediction of the system's behaviour is <u>homogeneity</u>. In advertising, market segmentation by response behaviour is a perfect example. If identifiable groups can be found to have similar characteristics which may be exploited in terms of appeals, then this audience homogeneity will be

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capitalized upon.

In spite of these two ways of attempting to improve the predictability of the system's behaviour, the sheer number of receiver elements and the possibilities for distortion of the message at any stage, make an analysis of the total system output necessary. Statistical sampling procedures are usually employed because of the size of the audience, and the reaction of all the receiver subsystems to the message is inferred from the sample.

Sutherland's last dimension also has important implications for advertising systems. The dynamic or time dimension introduces the possibility for changing environmental and system states over time. We have shown that advertising is an open system, interacting with its environment and adapting to changes in the milieu. The dynamic nature of a particular advertising system will, therefore, depend largely on the industry -- the competitive situation, ease of entry, nature of the product and the product's stage in the life cycle. For example, if a firm has almost all the market for a product with no close substitutes, then it is unlikely that its advertising program will be seriously affected by competitive environmental chan-In a similar manner, advertising for a product in the maturity phase ges. of its life cycle will probably be a more stable system than the program for a completely new product. Even a well established commodity can be subject to a fair degree of fluctuation and competition which could have a major affect on advertising plans and objectives. A very current (Spring '69) example has been the introduction of the Ford Maverick into the small car market. With the announcement of the pending introduction of such a vehicle, the advertising plans of the automobile companies must have undergone intensive revisions. In other words, the stability of an open system over time

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really depends on the nature of the environment.

The way in which the environment varies also has implications for the nature of the advertising system--especially the nature of the control subsystem. Regular, predictable, variations in the surroundings can be accounted for in the setting of plans and objectives. In the opposite situation, where the environmental fluctuations are irregular and unpredictable, a number of alternative strategies must be developed for various possible environmental states and even the objectives themselves might be subject to change. If the goal of an advertising program were to increase the number of people aware of a brand from 25 percent to 45 percent and the cost of media exposure suddenly doubled, the target may have to be changed.

The speed and amount by which the milieu fluctuates affects the control subsystem in terms of the frequency of monitoring. If serious difficulties cannot arise from period  $-t_1$ , to  $-t_2$  then more frequent measurement of the systems response does not add to the control of the system. For some advertising systems, the measurement time periods may be days or weeks (eg. detergent market) whereas in other cases it may be years. (eg. jumbo jets). Obviously then, the rate of change is important in the system as long as the magnitude of the change is sufficient to warrant revision of plans and objectives.

In the light of the foregoing discussion of the advertising system, we should now be able to revise our simplified advertising model (Figure 7) in a manner which should come a little closer to reality (see Figure 9).

Having discussed the nature of the advertising communication system, we can now see <u>why</u> the final audience reaction is not the only monitoring used for control. If it were, this would be akin to assuming that the

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Fig. 9.-- Advertising control system

that the subsystems were completely deterministic and only reacted to the inputs from the preceding subsystem. In a mechanistic system this assumption would be justified.

The most reliable control method is, after all, direct coupling--which can be used in the absence of natural variation (noise) in what is connected. In the probabilistic category, however, feedback offers the only really effective mechanism for controlling endemic variation. (Beer, 1960, p. 31)

In Figure 9, each box represents a subsystem, processing inputs within the environmental constraints. In two cases it appears that we are monitoring inputs to the media and audience. Actually what is being measured is the output of "sub-subsystems" which act as links between the advertising department and the media in one case and the mechanical transmission operation in the other. This multiple monitoring is performed because of the changing environment which may impinge on the message transmission at any stage in the system. It also is done because the cost of sending the message usually is fairly substantial and advertisers would like their communication to achieve its objective as inexpensively as possible.

In addition to the general nature of the advertising system, the overall elements of the system should be briefly examined in terms of input, output, processor, feedback and control. The latter element will be examined in detail in the following chapter.

The inputs are initially the results of an analysis as to where the company is now and where it wants to go. Advertising research data on present attitudes and opinions, nature of the product, available funds, and finally management objectives are fed into the system. Once the process has been set in motion, the feedback loop provides input information by monitoring the results of the systems or subsystems' operation.

The system output optimistically will be the achievement of the objective--a favourable reaction (either overt or covert) from the desired audience.

Between the input and output lies the <u>processor</u> in the system; advertising--the means by which the system achieves its objective. Included here are many factors, from the formulation of the commercials, encompassing artwork, copy, scheduling etc., to the physical transmission of the symbols. One can see that the processor usually implies a number of subsystems and an understanding of its operation can surely facilitate the creation of objectives and other input data.

Advertising system <u>feedback</u> was mentioned previously and is simply information on the nature of the system output. Acquisition of this intelligence may be difficult and expensive with the result that compromize information is accepted as a substitute in indicating the acceptability of the system output. These substitute or proxy variables are discussed in

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the next chapter.

One further factor affecting the system's behaviour is the environment. The goals of the system are achieved through the processing of inputs but the environment limits or constrains the conduct of the processor element. For example, the advertising system's goal of favourable audience response cannot be achieved through unlimited means; government legislation prohibits the use of force or threat; social attitudes, mores, taboos and so on limit the symbols that can be transmitted. Within the company, management policies, financial conditions, and human resources act as limiting agents on the system operation. The environment sets the boundaries of behaviour in which the system is free to operate.

Advertising, as one of the controllable variables of marketing, is obviously a highly complex entity and one cannot help but wonder how and what is really being controlled. This question is the subject of the next chapter.

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#### CHAPTER IV

# ADVERTISING CONTROL

Control of a system implies that its behaviour can be directed towards a specific goal in a premeditated manner. The efficient achievement of objectives demands that resources be allocated in a profit maximizing manner and this can only be done if the behaviour of the system is subjected to the will of the administrator. Also, from the standpoint of the firm, advertising is only one variable in the marketing mix and therefore its control must be co-ordinated with the other functions to avoid suboptimization. For example:

Advertising schedules improperly related to market and production conditions can produce disasterous shifts in the <u>timing</u> of sales without increasing long-run sales; or can produce peaks and valleys in the sales pattern which do nothing but increase factory and distribution costs. (Forrester, 1959, p. 101)

This indicates that not only must system goals be compatible with each other, but also the means of reaching them should be co-ordinated. Control is, therefore, extremely important in maintaining a viable position in the market place.

In this chapter we are dealing primarily with the regulatory subsystem of advertising. In Figure 9, this was represented by the administrator. In this control subsystem the information or input is compared to desired results (processed) and a decision (output) is transmitted to the next subsystem. The control problem can be generalized as in Figure 10.

The elements necessary for control are apparent from the diagram. Firstly, the duration of the campaign must be determined and an objective



Fig. 10.-- Control model

established for that time period. Advertising is a continuous process in any on-going business with the consequence that the goal of an advertising system is a dynamic entity. The objective will, therefore, depend heavily on the time period chosen and thus point C is the target for a given unit of time. The <u>trajectory</u> which the system traverses to reach point C is theoretically the result of dividing the campaign into an infinite number of time units and establishing objectives for each unit. The resulting points would represent the curve. Developing an infinite number of objectives is hardly feasible and consequently only a limited number of intermediate objectives (eg. A and B) are established. The trajectory or intermediate objectives are a result of formulating the <u>plan</u> or the specific actions necessary to achieve the goal. Once the plans, objectives and trajectory have been established, the system must be set in motion and the <u>actual</u> output measured and compared to the trajectory. If the two coincide sufficiently, in the opinion of the administrator, then the plan will be continued until

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the next measurement period. But, if there is a divergence between the desired and actual results which is outside acceptable limits (either quantified or intuitive) then contingency plans will be implemented either to bring actual results into line or to revise the trajectory. The choice depends on the administrator's analysis as to the cause of the deviation. Each stage in this control process involves a great deal of time, effort, and resources.

The above discussion took the perspective of controlling the advertising system as a whole, but the complexity of the task becomes apparent when is is realized that for rigorous regulation of an open system, these steps must be taken for each subsystem. In Figure 9 we included an advertising department, the media, and the audience. In addition, we monitored media and audience input. This means five sets of plans, objectives and measurements and this is a simplified system! Obviously there is a very substantial cost associated with control as well as undisputed benefits. More will be said of this factor later.

Each of the stages of developing a control subsystem will be examined in turn. After many years, the question as to what constitutes proper advertising <u>objectives</u> still remains unsettled. The problem is a serious one, as the effectiveness of advertising can only be judged if specific objectives are set. In other words, effective at what?--in reaching the objectives. The argument centres around the question of whether the measures should be sales or communication objectives. At this stage we have a bias towards communication goals such as awareness, belief, understanding and favourable attitudes, but there are many reasons for this besides the subject matter of this paper. Those who argue in favour of sales indicators, make the

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measurement of effectiveness extremely difficult as "...advertising is only one of several marketing forces that lead to the ultimate objectives of a sale." (Colley, 1965, p. 10) To determine how much of a sale is due to advertising is almost impossible. This is not to say because it is difficult it is wrong but:

At most, it (advertising) is considered to have done its job by "bringing the buyer to water." But whether he drinks depends upon the product, the price, the packaging, the personal selling, the services, the financing, and other aspects of the marketing process. (Kotler, 1967, p. 456)

In this discussion therefore, we take the viewpoint that the goal of advertising is persuasive communication. However, it should be noted that "persuasive communication" is difficult to define in operational terms. As a result, "proxy", surrogate or substitute variables are often accepted as indicators on the assumption that there is a high correlation between desired outputs and the proxy measures. If the correlation can be statistically validated or at least, logically justified, then control through these surrogate measures may be most efficient. Attitude changes and increases in brand or product awareness can be quantified (Lucas and Britt, 1963) but it is a highly expensive and time consuming task which in many cases could not be justified on a short-run continuing basis.

The aim of "persuasive communication" must, therefore, be translated into more objective terms if it is to facilitate measurement for "...defining goals is the key requirement for effective advertising planning and the measurement of results." (Kotler, 1967, p. 451) In essence, we are attempting to quantify what part of the marketing mix advertising is expected to play. For example, if the objective is to improve the favourable attitude toward a particular brand, then a "favourable attitude" must be operationally defined. In addition, to go from A to B, one must know the position of A, ie. the present state of the audience. Knowledge of the potential state and the associated cost of achieving this potential is often very difficult to obtain. With a new product and a new advertising program, what is the most favourable attitude possible and the cost of obtaining it? Past programs and similar products may provide some guidelines but they will be approximations at best. To summarize the characteristics of a good objective, it should be:

- (1) Set in relation to a specific time period.
- (2) Set in relation to a specific budget.
- (3) Set in relation to a specific plan of action.
- (4) Optimally integrated into the firm as a total system.
- (5) Quantified as far as possible.
- (6) Capable of being measured directly if possible or indirectly by logical, highly correlated proxy variables.

In terms of the system control task, quantifying the final desired output of the system is not the only difficulty. We saw that advertising is composed of a number of open subsystems. If these subsystems were coupled directly to each other in such a manner that there could be no distortion except at the initial system input and final output, then objectives and performance measurements could be developed for the terminal stage. To make such an assumption in advertising would be naive. At the other extreme, it is possible to set objectives for each sub-sub-subsystem, to the point where the major task of the enterprize is setting objectives for the system. The "Best" path of course lies somewhere in between, for if goals are to be useful, actual results must be measured and the comparisons used as a basis for decision making. Whether this is worthwhile or not will depend on the information economics. These will be looked at in conjunction with measuring actual results.

The formulation of plans and the establishing of objectives will in most cases take place simultaneously, because any objective has a cost associated with its achievement. If the plan is too expensive, the goal will have to be revised. Planning involves detailing the specific steps felt necessary to reach a goal. It implies a dynamic dimension as scarce resources are allocated over time and intermediate objectives are established. Setting the trajectory really means scheduling a series of events in such a manner as to reach the objective with a minimum of effort. If a retail store wants a 20 percent increase in customer traffic by the end of six months, how much of an increase should there be at the end of one, three and five months? Should the plan be a saturate the market initially and then taper off? Is the audience reaction a lag function of advertising expenditures or is it immediate? The so-called optimum path may be very difficult to establish and track. Based on subjective opinion and historical experience, a realistic route will have to be established, while realizing that the ideal time-action profile could be considerably at variance. Some obvious factors that could be taken into account, include seasonality in areas such as product use, media habits, personnel resources and so on. Much of the above information would be supplied in the way of background research to an advertising campaign.

Volumes have been written on advertising programs and here only some of the basic steps will be mentioned as they have implications for the inputs and outputs of the various subsystems. In our basic advertising system (see Figure 9), we had three agents--the advertising department, the media

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and the audience--and one control subsystem--the administrator. If control is to be maintained at these various subsystem levels a number of decisions must be made. Having established initial objectives and given an approximate budget, the advertising department must produce the creative side of the message. This would include choosing the campaign's theme, doing the art work and writing any necessary copy. At the same time, the department will have selected the media mix to be used in the campaign. How much of the effort should be channelled through television, radio, newspapers and so on? The nature of the product, message, and audience will all affect the final media strategy. The media strategy also involves the problem of scheduling. We mentioned previously the issues inherent in co-ordinating the advertising effort with other parts of the marketing mix (setting interim objectives etc.), but there are additional constraints in that the use of some of the major media such as television may require a year's lead Newspapers and radio on the other hand may only require two or three time. days. If commitments must be made a year in advance, careful preplanning is essential as costs are very high. Pretesting the campaign on a small scale is probably ideal but not always possible because competitors may retaliate by launching parallel programs which reduce the campaign's impact. Large corporations often refine their advertising efforts by introducing programs sequentially into different geographic areas. Standard Oil of New Jersey unleashed the tiger in the United States and then in Canada and other countries.

Before the media schedules can be confirmed, the advertising budget must be finalized. In theory, the budget should be expanded to the point where the marginal return from a dollar spent on advertising should be equal

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to the marginal return from a dollar spent on other company functions. The problem then is one of equating the marginal returns of subsystems within systems--ie. optimization. The details of this procedure have been elabora-ted by Allison (1961).

Some prior evaluation of the program is possible if the campaign is pretested, but in general, judging effectiveness entails the after-the-fact measurement of actual results to see if the campaign objectives were achieved. Rather than running the complete campaign and then doing some research and finding the objectives weren't achieved, in this paper we are attempting to see how and if the program can be controlled and measured on a semi-continuous basis. Where, how and when do you alter your basic plans and even more important, what information (short of a full market study) can you get and how reliable is it? This brings us to the third stage necessary for control, and that is measuring the actual results. The technique of measurement will not really concern us (see Lucas and Britt, 1963) as we are more interested in what should be measured and when-a problem of information economics.

The question as to what measurements should be taken to control a system is really a task in designing information systems.

The challenge is to design a company information system where the value of information is maximized for a given expenditure or the cost is minimized to achieve a given mix of information. (Kotler, 1967, p. 569)

Before proceeding, we should note that this involves deciding what information should be produced, the form in which it will be produced and finally who will receive it. We will primarily be concerned with examining what should be monitored, as the form will depend on specific cases and we have set up our general model so that the information is processed by the administrator.

In dealing with information systems, several authors (Thayer, 1968;

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McDonough, 1963; and Churchman, 1968) make a distinction between data and information. There seems to be general agreement that <u>data</u> refers to the sensory input whereas <u>information</u> is the meaning taken from these sensory inputs. "Information is used here as the label for <u>evaluated data</u> in a specific situation." (McDonough, 1963, p. 71) The distinction is important for our purposes as:

Information, not data, is the raw material for thinking, decisioning, problem-solving, attitude development, learning and all of the specifically human activities that concern us.... (Thayer, 1968, p. 29)

Gathering this information involves the expenditure of effort and time and some decision rule is necessary to allocate these scarce resources. In theory, the information should be gathered and processed if the cost (C) of acquiring it is less than the benefits (B) derived from it, thus giving it a positive value (V). Algebraicly:

V = B-C (Value equals benefit minus cost)

and if V > 0 then the information should be produced or similarly if B/C > 1.0. The difficulty in applying the rule lies in evaluation of the respective costs and benefits.

One author (McDonough, 1963) has adapted the economist's supply and demand approach to the analysis of information in relation to the solving of specific problems, which in our case would be the control of an advertising program. In doing this he refines our concept, as now:

Information is the measure of the net value obtained from the process of matching the elements of a present problem with appropriate elements of data.... (McDonough, 1963, p. 76)

The interpretation of this statement is facilitated by examining Figure 11. The objective is to find the point where the maximum net value of information



Fig. 11.-- Net value of information

time to study problem

Net value... at point where decision is made that problem definition is adequate and that enough information has been obtained to make a decision. (adapted from McDonough, 1963, p. 82)

will be obtained. This is not easy as the shape of the "Value of information" curve will depend on the individual's utility function and the consequences of making an incorrect decision. If our administrator is a risk-seeker he will be satisfied with less information in making his decision. The riskaverter will have the opposite characteristics of wanting more information to solve the same problem. Since only the administrator can judge his personal utility function, ideally he should design the information system.

The value of information will also depend on the problem to be solved. If the task is to decide whether audience reaction to your commercials is favourable or unfavourable, there is a high value in answering the question. If the general reaction is extremely unfavourable, there would be a very low value in knowing which specific advertisement was liked the least. In summary, the value of information depends on the nature of the administrator and the problem.

Information costs have a significant effect on the nature of the monitoring of system and subsystem outputs. The effort needed to get various indications of advertising progress affect the amount, kind, and frequency of the information. We have seen that information can be expensive relative to the problem to be solved, but it may also be expensive in absolute terms. Companies have limited resources and consequently they are constrained in the <u>amount</u> of information they can acquire. Knowing the explicit advertising plans of competitors may be worthwhile in that the cost-benefit ratio is greater than one, but if the firm cannot finance the cost, the information will not be acquired (ignoring legal implications).

The <u>kind</u> of feedback is also affected by cost. We argued that the objective of advertising should be persuasive communication and, therefore, changes in audience attitude, or awareness would be typical measures of effectiveness. This type of measurement is expensive. It involves considerable effort in formulating a reliable, valid questionnaire; if possible, testing a control and an experimental group before, during and after a campaign; and finally analyzing and acting on the results. The procedure entails considerable time and specialized personnel. If it were a cross-Canada campaign, running for a year in a highly volatile industry, control might necessitate monthly surveys with a resulting prohibitive expense. In such a situation, the firm may be willing to accept the previously mentioned indirect measures of effectiveness during the campaign and do detailed surveys only at the end. These substitute or "proxy" variables should be

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recognized as a compromise between accuracy and cost. Sales volume and market share are probably the two most commonly used, as the former is always available as part of the accounting system and the latter is often supplied by the provincial and federal governments. If advertising is a major component of the marketing mix, these measures may be fairly valid, but if personal selling or other elements play the major role, then reliance on these indicators is not warranted. Many other surrogate variables can and are used to indicate advertising effectiveness. The Imperial 0il "Tiger in the Tank" campaign is illustrative of many unique forms. At the start of the program tiger tails were first given away and then eventually sold along with inflatable tigers, tiger pyjama bags and other tiger toys. The volume of these products ordered by dealers was one measure used to indicate the program's effectiveness. Retail sales of gasoline and provincial market shares were also employed. More subjective information was also gathered. For example, competitors put up signs that read "Our gas eats tigers"; newspapers published tiger jokes; and the campaign was commented on by acquantances of employees. Obviously, these proxy variables are not all of equal benefit (or equal cost) in indicating the effectiveness of the communications, but they do illustrate the multiplicity of possible indicators.

The <u>frequency</u> with which information is produced is also affected by cost. This was illustrated above as the reason for using proxy variables, but oftentimes even proxy variables will not be used. If a firm is using market share as an indicator of advertising progress, it may wish the information was provided on a weekly basis. But, since most firms could not afford to generate this feedback, they will settle for a monthly figure provided by

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the government, thereby making the implicit assumptions that there will be no significant controllable changes between reports. All these influences must be taken onto account when developing the information system for advertising.

One additional factor which affects the feedback chosen is the serial structure of the subsystems in advertising. In this sequential arrangement, the output of one subsystem primarily determines the output of the next. It also seems logical to assume that the amount of distortion in the final output will increase as a direct function of the number of subsystems through which the message is processed. As an example, if the advertising department output is faulty and is passed on to the media subsystem, the open nature of the media subsystem will cause it to be distorted still further and this will be additionally amplified by the receiver subsystems. However, if the advertising department and the media have processed the inputs correctly, there should be much less distortion at the receiver end of the system. Ιť is therefore, essential in a sequentially structured system that the initial inputs be as established by the administrator ie. the objectives must be clearly defined. If the administrator is prepared to assume that his inputs to the system will be processed exactly as desired, then monitoring the final result will be used to control the system. With the complexity of advertising this assumption is unwarranted and generally each subsystem should be monitored, at least occasionally.

When actual results have been measured and compared to the objectives, some plans must be made to reduce any differences. As with the gathering of information, the number and kinds of contingency plans developed will depend on a cost-benefit analysis. If there are unlimited alternative environmental

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states with equal importance and equal probabilities of occurrence, then, it is unlikely that contingency plans will be made. An environment in which only two or three major system states are possible will result in the development of alternatives for these situations. The importance of the possibilities will depend on the effect they could have on the program and depend also on the time necessary to take compensating action. This is just reiterating the fact that in an open system, the stability of the environment affects the nature of the control. It is worthwhile at this stage to realize that the comparison of actual with desired results may lead to initiation of contingency plans <u>or</u> the revision of the objectives <u>or</u> both. The objectives were developed under a set of assumptions and if these assumptions do not materialize, it may be necessary to revise the goals of the system.

In open systems, there is a dilemma in the decision making process when actual and desired results diverge. It arises because:

In the open-loop system, the executive (administrator) makes the comparison between outputs and standards and uses his discretion whether any action is required and, if so, what kind. (Kotler, 1967, p. 570)

This discretionary decision process exists in a gestalt or open complex system because the output can be the result of a great many causes. This produces the dilemma. If the response to the actual-desired variance is automatic or based on some decision rule, speed is gained at the likely expense of accuracy. Conversely, if a detailed analysis of the causes of variance is undertaken, then the desired response may be too late to be effective. The task then becomes one of deciding which decisions can be handled mechanically and which ones will take experience, judgment and analysis. This choice would have to be made in relation to a particular program in a particular industry by an experienced administrator.

The nature of the objectives of the system affect the choice of points at which the process is controlled in the long run. In a system composed of serially connected subsystems, if the final output is satisfactory, it will usually mean that the output of the intervening subsystems is also satisfactory and hence the process deemed under control. Thus if final output can be measured just as easily, frequently and accurately as subsystem output, the end result would be the most efficient entity to monitor. However, in the short run often it will be more feasible to monitor subsystem outputs--but the principle remains that the closer the system can be monitored to the end result, the more effective control will be. In most cases, where measurement of end results requires expensive attitude surveys or similar measurements, short run control will be maintained through monitoring subsystems and long term control will be achieved through the end result. When the process is controlled at the intermediate subsystem level, an implicit assumption is being made that there is a good correlation between the subsystem output and the total system output. For example, if the manufacturer is prepared to accept that if his radio commercials have been broadcast as planned, that they will be processed by the audience as intended, then control could be maintained by comparing the desired radio output to the actual broadcasting log. But, eventually the final output must be used to evaluate the program's effectiveness. In conclusion, the system, therefore, can be monitored at the level of (1) subsystem output, (2) total system output or (3) both at once. Control may be achieved through the use of (1) proxy or substitute measures of performance, (2) direct measures of results (or output) as defined by the objectives of the system, or (3) both.

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A point form summary of some of the preceding comments may be in order. If we assume that a solid advertising research base has been provided, then to develop a control system one must:

1. Analyze the total system into subsystems.

- 2. Establish objectives for the system and subsystems.
- 3. Develop plans for reaching the objectives.
- 4. Determine the kind, frequency, and amount of information to be produced (cost-benefit analysis).
- 5. Formulate contingency plans for major alternatives.
- Decide which decisions will be automatic and which will be discretionary.

These six steps are not meant to imply sequential development as many of them, such as the objectives and the information to be produced, have to be evaluated concurrently.

Having established the control parameters, we are now in a position to launch the campaign and formulate a search procedure to control the program. A general model in the form of a flowchart will be developed which is essentially nothing more than a map through the mental maze. First of all, let us look at a simplified situation where there is only one system and examine what questions would be asked to decide whether it is under control. In Figure 12, the steps have been diagrammed and are as follows:

- 1. Is the system output as desired? (ie. within established limits of objective)--if Yes wait until the next time period and measure again.
- If not, are the inputs as desired?--if not correct the inputs and recycle.
- 3. If <u>Yes</u>, is the system environment as expected?--if <u>not</u> initiate contingency plans and devise new systems.
- 4. If <u>Yes</u>, there is a processor malfunction and sub-subsystems will have to be analyzed so we exit this system.



Fig. 12.-- Typical system control process

These steps are the basic cycle which appears in the elaborated Figure 13. One assumption should be made clear and that is we are assuming that the administrator has the "correct" inputs for given environmental assumptions. Since this is really a function of the ability of the individual administrator, it has not been explicitly mentioned here. However, if the preceding four steps did not uncover a problem, then the conclusion would have to be that the matching of programs with the environment was incorrect.

In Figure 13, a general model has been diagrammed which expands the search procedure in Figure 12, to include control of subsystems and major and minor control cycles. The model is still simplified, as i maintains our structure of the advertising department, media, audience and administrator subsystems. Realistically, the media subsystem should be subdivided into the various mass media such as television, newspapers, radio, billboards and so on, but while the diagram would be more complex, the logic and steps would remain the same. For clarity we are assuming that the system is utilizing only one medium.

The major and minor cycles should be elaborated. Mention was made earlier that the economic feasibility of gathering certain types of information influenced the frequency of major surveys of final audience subsystem output. In this context, we have made the assumption that advertising department and media output are easier to acquire and, therefore, monitored more frequently. This is done by following the <u>minor cycle</u>. The measurement of the final output would be performed at less frequent intervals by following the <u>major cycle</u>. In some systems where measuring total system output is just as easy as measuring subsystem output, there will be no minor cycle.

In Figure 13, the first question is whether one is dealing with a

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נוט ושי -- כבטוברסן מקתרגן וצועט כסען גסן כנטרן

major or a minor cycle. The former path is represented by the dotted lines, the minor by solid lines.

Travelling the minor cycle, the output of the subsystem <u>nearest the</u> <u>audience</u> (media) in our sequential chain is compared to the objectives and if the variance is within tolerable limits of the trajectory, then the process is recycled to wait for the next time period. If the output is not acceptable, then the subsystem output <u>closest to the beginning</u> of the system (advertising department) is examined. If its output is acceptable the next subsystem output is examined and this is continued until one output is found to be faulty. When the difficulty has been localized to one subsystem, then steps two, three, and four on page 49 are initiated. The procedure to be followed in the major cycle is the same with the exception that allowance has been made for the possibility that all subsystems may be processing inputs correctly except the audience, in which case the encoding of the message has been faulty and major program revisions are necessary and the system grinds to a halt.

This has been a rather lengthy chapter in which control and information systems have been discussed in theoretical terms. The result of the discussion was a general control model which in the next chapter we will attempt to apply to a specific firm in a specific industry.

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## CHAPTER V

# PRACTICAL APPLICATION OF CONTROL THEORY

The discussion to this point has been presented in theoretical terms. In this chapter, an attempt will be made to illustrate how the concepts and general analytical framework can be applied to a practical situation. The following example is not meant to be a case study, although it does deal with an existing construction-real estate company with which the author will be employed. The information used was obtained from the management at their head office. In addition, some of the literature on real estate advertising practices has been scrutinized but in most cases found to be outdated or very superficial. This lack of theory and the opportunity of a future chance to test the ideas in practice prompted the choice of a real estate marketing firm for practical application.

The chapter begins with a brief look at the system environment or the industry as a whole and then focuses on the particular system and subsystems within the specific company. The control system is then examined with respect to objectives, plans, measurements and malfunction and finally some conclusions are reached as to the value of the systems approach to the analyses of advertising control and suggestions are made as to further research.

The housebuilding-real estate industry is characterized by a large number of small builders and realtors. For example, in 1968 there were 1,763 builders constructing dwellings financed by the National Housing Association (N.H.A.) and 1,555 of these contractors financed 25 dwellings or less while only 34 builders financed over 100 houses per year. (C.M.H.C., 1969, p. 62) This is not a direct reflection of company sizes as there are other means of financing besides the N.H.A., but it does indicate that there are a great number of small builders and only a few large ones. In most of the small companies, the construction and the marketing of homes is separated as the contractor builds the house and then lists it with a real estate firm. By contrast some of the larger companies--including our example--are integrated to the extent that they construct and market their own homes.

The stability of the industry depends on a number of factors. The volume of building can fluctuate widely from year to year while the product and the advertising practices have changed very slowly. In 1951 dwelling starts were 81,000 dropping to 73,000 in 1952 and jumping to 97,000 in 1953. In 1963 the figure was 128,000 but climbed to 151,000 in 1964. (C.M.H.C., 1969, p. 1) These fluctuations are caused primarily by economic conditions as reflected in employment and the mortgage funds available from lending institutions. In addition, population growth provides a built in stimulus to demand and C.M.H.C. comments that the "...major source of future housing demand is net family formation which is expected to increase from the current (1968) rate of 118,000 per year to 145,000 by 1976." (C.M.H.C., 1969, p. xii) The stability of the demand for housing then, depends primarily on the above factors which can be predicted with a "reasonable" degree of accuracy using standard forecasting methods (see Ferber and Verdoon, 1962).

The nature of the product or the house itself does not change very rapidly. Styles become popular and then fade away but in general most of the changes involve adaptations to new complementary products such as built-inovens, dishwashers, garburetors and other luxury innovations such as extra bathrooms. It is very unlikely that a new invention will all of a sudden

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render a housebuilders product obsolete.

The advertising environment in the real estate industry is also fairly stable as the large number of small firms means that in most cases no one company can afford to put on a campaign of sufficient magnitude to seriously affect another company's advertising program. However, an extremely good campaign in terms of quality and creativeness by one company can affect the plans of others.

The media practices of firms are also relatively stable in total although the variation between individual firms may be significant. For example, in 1951 realtors remarked that the "...classified columns of daily newspapers or weekly publications usually draw the best response for the amount of money expended" (McMichael, 1951, p. 262), and in 1967 "...while realtors can use every known form of advertising, both traditionally and logically newspapers are their primary medium of communication with the public." (National Institute of Real Estate Brokers, 1967, p. 11) This heavy use of the classified and display newspaper advertising has been supported by a number of studies such as that done by the Chicago Tribune Research Division (1966) who surveyed people searching for new accommodation and found that newspapers were the primary and initial source of information in the search for dwellings.

In addition to newspapers, the other mass media are used in varying proportions by different firms. Outdoor signs are employed extensively, while radio and television are used somewhat less because of the higher cost:

On the advertising menu, radio is T-bone steak and television is filet mignon.... Therefore they (realtors) ordinarily earmark most of their advertising money for signs, newspaper advertising and direct mail, reserving radio and television for special efforts. (National Institute of Real Estate Brokers, 1967, p. 55)

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In summary, the market for new homes is relatively stable or at least reasonably predictable as are the advertising practices of real estate firms. Individual competitive campaigns however, can definitely affect short term sales volume.

An overview of our illustrative company will help clarify some of the characteristics which would influence our particular advertising program. The firm has been engaged in building and selling new houses for the last 17 years and now operates in three geographically dispersed areas. Sales volume is approximately 800 units per year with sales revenue of \$15,000,000 per year. As mentioned previously, the company builds the houses it sells and the volume of construction enables some of the product to be mass produced in a plant. The result of this method of construction, is that production facilities could be a limiting factor on sales volume as could land, labour or mortgage money. Any advertising program must, of course, be coordinated with the supply of all three commodities. This is especially true because the company maintains its own sales force that operates out of model homes and is paid on a commission basis. If an advertising campaign were so successful as to sell houses faster than they could be produced, as soon as no products were left to sell, the salesmen would leave. Coordination to maintain continuity is, therefore, of the utmost importance. In the situation where there is excess plant capacity and land and financing are available, coordination becomes less crucial and the task becomes one of contacting potential customers.

Before examining the subsystems within the firm, it should be pointed out that two braod types of campaigns could be undertaken in the industry. The first is an institutional program designed to promote goodwill towards

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the company and to keep its name in public view. The benefits expected under this plan would be long range so that the individual looking for a home three years hence would automatically think of the XYZ company.

The second type of program and the one that will concern us here, is aimed at stimulating an immediate action by people who are willing and able to buy now. For most real estate companies, the major portion of their advertising funds are spent on this endeavour.

Returning to our schematic advertising system with the advertising department, media, audience and administrator subsystems, it is possible to show that these fit conveniently into our company organization which is illustrated in chart form in Figure 14.





If we deal with only one of the geographic areas, then the assistant region manager has the position of the <u>administrator</u> or the control subsystem. It

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is his responsibility to develop the company objectives and oversee the plans and expedition of the program. The feedback on the results of the campaign would be routed through him for decisions.

The <u>advertising department</u> is represented by the managers of two sales divisions and the staff of salesmen. As in many real estate companies, the salesmen write their own classified advertisements under supervision, but display advertising and billboards, radio and television are the responsibility of the sales managers with the aid of people employed by the respective media.

The <u>media</u> subsystem of The Company has been developed through historical experience so that the advertising dollar for the mass media is split as follows:

(1)	Newspaper-classified	50%
(2)	Newspaper-display	10%
(3)	Billboards	10%
(4)	Radio and television	20%

The remaining 10 percent is spent on miscellaneous promotion such as small signs, direct mail and point-of-purchase handouts. In general, the total budget is determined as a percentage of projected sales volume and is normally between one and two percent of sales revenue.

The <u>audience</u> subsystem consists of those people who are potential customers for new homes in a given geographic area. Although the company is operating in three distinct areas, we will only develop the program and control system in terms of one. The same procedures would apply for all areas, but the quantity of information generated would increase.

The company's advertising system is therefore composed of four

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subsystems as discussed above. Ecologically, the subsystems are subject to "noise" as the audience may ignore or distort the message if interest rates or unemployment are high. Similarly, the advertising department subsystem behaviour can be influenced if the sales managers are afraid that sales at a faster rate than production will result in the loss of their sales force. The media subsystems are also influenced by "noise" as different firms are vying for preferred time and space while the media people are trying to keep all their clients satisfied. Finally, the administrator will also be an open subsystem, as he must be able to adapt the advertising program to changing economic and demographic conditions. He must also be cognizant of the competing systems within the firm and attempt to optimize the operation of the firm as a whole and not just the advertising system.

In the following development of The Company control parameters and the information system, the major assumption is made that the goals being pursued in the advertising communications system are optimal for the company as a whole. In other words, the advertising program subsystem has been integrated into the system of the firm in the most efficient manner. This qualifying assumption enables the discussion to concentrate on the communication system only, while recognizing that there is a need for research on the problem of how to avoid suboptimization.

In the given environment and existing subsystems how would the control process be arranged? Referring back to Chapter IV, Figure 10, we need to establish objectives for the system and subsystems, develop plans for reaching the objectives, decide on the information to be produced, formulate contingency plans for the major alternatives and finally decide which decisions will be automatic and which will be discretionary. These factors

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will be examined in terms of the total system, the media subsystem and the advertising subsystem and some comments made as to the assumptions implicit in controlling at the subsystem level.

The <u>objective</u> of the advertising system output is to convince people that before they buy a new house they should see what The Company has to offer. The goal is not to sell the house even before the customer sees it for:

Advertising alone can neither complete a listing agreement nor negotiate a sale. It is only a means of attracting enquiries. Its success depends first on the quantity and quality of enquiries received, and second on the skill displayed by sales personnel in dealing with the owners or prospective buyers who reply. (National Institute of Real Estate Brokers, 1967, p. 8)

In other words, it is hoped that the communications will "lead the horse to water" and then the sale depends on the total product and the salesmen. The direct measure of the audiences' processing of the message could be a before and after survey asking people to rank the building firms as to the ones that they would contact before buying a new home. If other things are equal, then a shift in the positive direction would be taken as an indication that the communication was processed as intended. This "direct" measure however, might be considered too expensive and time consuming. As a result, a proxy variable--the number of enquiries received--might be employed under the assumption that the two measures are positively correlated. The indirect measure would be used if it is less expensive to acquire.

It should be noted here that <u>there are no bonafide "direct" measures</u> of advertising effectiveness. From our discussion of the communication process, it will be recalled that the message or symbols are decoded, processed and then a reply encoded. The essence of what is wanted to indicate effectiveness is an analysis of the processing, but what is in fact being

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monitored is the encoding of the reply--a proxy or indirect measurement. To a degree, this is an insignificant point, as the executive will not likely be concerned whether he controls at the direct level of cerebral activity or the indirect level of speech or action, as long as he controls! In the following discussions, direct and indirect will be used in a relative manner implying a ranking along a subjective continuum of "directness".

Returning to our surrogate variable of number of contacts, either personal or by telephone, it should be emphasized that the quality of enquiries received is especially important. For example, in some model villages:

...throngs of potential customers still surge through the developments. But the salesmen waiting behind desks in the model house garages are glum. Says one, "They're not buyers. They're tire-kickers." (McQuade, 1967, p. 153)

One way to monitor this quality factor is to see if the rate of sales per party contacted remains the same as the contact volume increases. For example, The Company has found that on the average four out of every one hundred parties contacted purchase a home. If the advertising program results in double the usual number of contacts; but the sales per contact rate is cut in half, then there has not been an increase in advertising effectiveness (other things being equal). For this reason, the analysis of advertising results must go further than just monitoring the number of contacts.

To develop the objectives, The Company would make an industry forecast of area housing demand and then in coordination with the resources of land, labour, plant facilities and financing, would determine The Company's desired market share in terms of housing units. If last years sales volume was 300 units and this years desired volume was 400 units with a sales per contact rate of four percent then 2,500 additional parties, or a year end objective of 10,000 parties in total, would have to be contacted with a

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corresponding increase in cost.

The <u>plans</u> for reaching such an objective would be primarily based on past experience. They would include decisions as to the amount of money that would be budgeted for the campaign; the information and general company image that should be projected; the duration of the program; and finally the specific increase in the number of contacts expected by a specified date. Contingency plans would be developed for the possibility that the campaign was successful to an unanticipated degree or conversely, if it turned out to be a failure. In addition, specific interim objectives would be established and the general form and frequency of feedback outlined.

At this total system or macro level, how would a system malfunction be analyzed? In Chapter IV a general search procedure was outlined in flowchart form (page 50) and this is translated into the specific example in Figure 15. The analysis follows the same general search procedure as in Figure 12 using the proxy variables, number of contacts and sales per contact rate (S.P.C.R.) If the system outputs deviated from the objective, then the inputs or administrator's objectives would be examined to see if they had been properly transmitted to the sales managers and salesmen. If they appeared to understand the objectives, then the competitive environment would be examined to see if other real estate firms had launched new campaigns or other forms of "noise". If the environment matched the original assumptions, then the processing of inputs must have been faulty and the media and the advertising department (ie. sales manager and salesmen) subsystems' behaviour should be analyzed.

Some supplementary surrogate measures of effectiveness would be used to validate the conclusions drawn from the number of parties contacted.

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Fig. 15.-- The Company's total system level control process
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The real estate industry is in the fortunate position of having a number of government agencies gathering statistics. The Dominion Bureau of Statistics, (D.B.S.) the Central Mortgage and Housing Corporation (C.M.H.C.), provincial and municipal governments all collect and publish figures on the housing industry. When this information is combined with statistics generated within the company the result is more information than can be used (see Table II).

# TABLE II

## INFORMATION RECEIVED BY THE COMPANY

#### Information

# IICque

Parties contacted	weekly
Sales vs competition (informal source)	weekly
N.H.A. mortgage applications	monthly
Housing starts	monthly
Housing completions	monthly
List of building permits issued	weekly

The information is listed in the order ranked by company management as to the relative value for indicating advertising effectiveness. The information on number of contacts is presently gathered by company reports although it is not formally utilized in the above manner. The salesmen turn in weekly statistics showing the number of parties contacted by telephone and in person while the office staff also reports telephone calls. This information
is considered by company management to be 100 percent correct, 80 percent of the time.

It will be recalled, that the closer a systems output could be measured to the end result, the more efficient control would be. In this case, the final result is easier to monitor than either the media or advertising department output and consequently, this should be the starting point for analysis. The information would be examined as in Figure 15. If the variation was explainable and slight then the control would automatically wait for the next measurement period. If the deviation was large, then the administrator or assistant manager would go through the procedure illustrated and use his discretion to decide on the appropriate action.

Although The Company advertising system could be controlled at the final output level, it could also be controlled at the subsystem level of the media output or the advertising department output. High correlations between the various sequentially linked subsystems make it plausible to assume that if the salesmen wrote satisfactory classified advertisements, then there is a high probability that the audience would process them as intended. As another example, if the media employed delivered the messages to the audience, then there is a strong likelihood that they would be correctly processed. The empirical measurement of these correlations could become fairly complex. For instance, an investigator would have to determine the correlation between the "direct" measurement and the proxy measurement of the total system output. From there, subsystem outputs, which in many cases are themselves surrogate measurements, would have to be correlated to the proxy measures of the total system output! Much work remains to be done in this area. For the present it is accepted that a subjective

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logical relationship is sufficient justification for controlling at the subsystem level.

In addition to <u>controlling</u> the system through subsystem output, feedback on their output is also necessary to <u>analyze</u> the system if there is a malfunction. To localize the problem to one subsystem, the inputs and outputs would have to be monitored. This procedure will be elaborated as the media and advertising department subsystems are examined.

What are the objectives of the sales managers and salesmen in terms of advertising output? Their goals would be to take the objectives and plans for the overall campaign and process them so that the output is a finished advertisement. In other words, the subsystem goal would be the encoding or production of the actual message. They must perform this task in relation to the given budget in the given time. There is therefore a direct as well as an indirect dimension to their output. Taking the latter first, a direct measure of the number of commercials produced in a given time period could be compared to the objective and control of this facet of the advertising department output maintained in this manner. The creative nature of the commercials would have to be evaluated indirectly by the administrator's subjective opinion.

The plans for the advertising department subsystem would entail deciding on the means of scheduling the commercials, producing the messages and transmitting the encoding to the different media, and arranging time or space in each medium.

A malfunction in this subsystem would be analyzed in much the same manner as in Figure 15. Firstly, the outputs would be checked, then the inputs and the environment and finally, if necessary, the processor element

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would be examined. The flowchart (see Figure 16) diagrams the specific steps that would be followed. If the inputs and environment are as expected then their must be a lack of skill or training in the sales force producing the advertising, and therefore sub-subsystems in the form of individuals would have to be examined.

Objectives and plans would also have to be formulated for the media subsystem. If the advertising department produces the creative side of the commercials, then the media subsystem objectives would be in terms of the mechanics of transmitting the message and in terms of the quantity of messages broadcast. This would cause control to be maintained by a comparison of the number of messages actually sent, to a corresponding objective-a direct measure. The mechanics would involve indirect measures, the administrator's subjective judgment as to the "correctness" of quality of transmission. For example, classified newspaper advertisements may be misspelled or printed with the wrong phone number; the message may appear on a billboard in the wrong location; or a television announcer or model may appear sloppily dressed. It is this kind of indirect information which should be combined with the more easily quantified volume measure in order to control the media subsystem.

The plans for this subsystem would be primarily concerned with scheduling or placing the commercials for each medium. Selection of these channels would have been done by the advertising department so that the role of the media would be simply to present the message. Figure 17 indicates the steps that would be followed in locating a system malfunction with the usual check on the inputs and the environment. A processor malfunction in this subsystem would probably imply that the service provided by the medium was poor or that

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Fig. 16.-- The Company's advertising subsystem control process



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the management was inefficient. If alternate newspapers, outdoor advertising companies, radio or television stations could be substituted for the faulty medium, then this possibility should be considered.

Each Company subsystem has been examined separately to see how its behaviour would be controlled and it is now time to integrate the pieces into a master plan for regulating The firm's advertising efforts. The procedures would follow the major loop outlined in the general flowchart in Figure 13 (page 52). The diagram applicable specifically to The Company (see Figure 18) traces the steps that would be considered and is basically just an assembly of the three separate control procedures with a few minor variations in the order the steps are taken. The questions we would be asking are:

(1) Is the process under control?

(2) If not, can the problem be localized to one subsystem?

(3) What is the problem within the subsystem?

The answers to these questions enable the administrator to make a decision on the appropriate action.

Of the many decisions that are required to keep the process under control, which ones will be automatic and which ones will be discretionary? On the basis of historical experience, it may be possible to develop upper and lower control limits for the quantitative measures. For example, if the volume of contacts is between plus and minus five percent, then the process is deemed under control and the administrator need not become involved in the decision making. Furthermore, if the cause of a malfunction can be quickly traced and easily corrected, then again the administrator need not become enmeshed in the detailed procedures. He must however play an active

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role when either the cause of the problem cannot be traced or the correction of the error involves a major decision or a revision in plans. Thus, with a defined search procedure and a small number of decision rules the administrator is in a position to control The Company's advertising program.

## CHAPTER VI

## CONCLUSIONS AND SUGGESTIONS FOR FUTURE RESEARCH

This ends the journey embarked on at the beginning of this paper with the exception of some conclusions, some evaluation of the worth of the project, and some suggestions for further research. The implicit hypothesis investigated was that the systems approach to advertising control could be developed in such a manner that it could be applied in a practical situation. Has the discussion supported the hypothesis? One would probably conclude yes, with the qualification that a great deal of work remains to be done in this area in both the conceptual and quantitative spheres. Forrester states that "...systems engineering is a formal awareness of the interactions between the parts of a system." (1965, p. 5) This summarizes the major benefit of the systems approach. It emphasizes behaviour rather than just structure. What the advertising department does, affects the media which in turn affects the manner in which the message is processed by the audience. Each unit is dependent on the other and the whole is only as effective as its weakest link.

In addition, the approach provides a framework for analysis, planning and control by emphasizing where and what objectives are needed. It also indicates many of the causes of system malfunction and provides a logical, efficient method for locating difficulties.

Many questions have arisen during the paper that indicate areas for future research. Some of these concern theoretical questions while others arise in attempting the practical applications. For example, what subsystem

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structures are most suitable for optimizing safety, speed, profit and perhaps delegation of authority? Are serial structures more efficient for quick decisions? Do parallel subsystem structures make delegation of authority easier? One would suspect that the "ideal" structure would vary with the goals of the system.

Another area already mentioned for research is the integration of the advertising system into the total system of the firm. What affects do changes in the advertising system have on changes in other systems? Forrester (1959) investigated this issue through computer simulation models-which raises another area of study. How can the control process be simulated or at least automated? We have developed the beginnings of a conceptual model but a great deal of empirical study must precede its rigorous quantitative application.

Some of the empirical studies could involve in-depth case studies of advertising programs designed and executed under the systems approach. Another alternative is to study a number of firms in different industries and take a cross-sectional survey of their advertising programs. This would uncover a number of practical problems peculiar to specific industries.

More study is needed on the automatic versus discretionary decisions in control. The efficient use of executive time would suggest that the more decisions that are automatic (yet correct) the better will be the management of the company as more effort can be allocated to judgment decisions.

The quantification of information cost-benefit analysis also needs more research to quantify utility functions and the intangible costs of information. This subject of measurement needs considerable attention as the essence of maintaining control is a measurement of actual versus desired

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outputs. The definition of objectives and the units of measurement to be employed in monitoring output need to be studied in order to understand the relationships between the direct and indirect indicators. The use of proxy measures introduces a degree of risk that the direct measurement could indicate different system behaviour than is indicated by an indirect measure.

In general, the systems approach can be applied to advertising but at the first subsystem level of analysis employed throughout this paper, some simplifying assumptions are necessary. In the framework applied to The Company, it was assumed that the various subsystems produced their respective outputs, without drawing on resources outside that subsystem. For example, in practice, it is unlikely that The Company advertising department would produce the art work for billboards. It would either be subcontracted to a commercial artist or the help of the outdoor advertising company would be utilized. To overcome this simplification, an additional level of analysis would have to be introduced, eg. the commercial artist "sub-subsystem."

Other simplifying assumptions made in applying the theory to the example were (1) The Company was only advertising in one geographic area and (2) only an immediate action advertising program was being executed-which eliminated the problem of concurrently controlling an institutional campaign as a parallel set of subsystems. These simplifying assumptions do not weaken the application of the theory as the assumptions can be removed by adding more subsystems. The analytical steps remain the same although the number of them increase considerably. Because of the complexity of many advertising systems, methods of handling analyses of large numbers of subsystems need to be developed. If the conceptual problems inherent in the

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social sciences can be overcome, then computers could provide the data handling capacity.

One additional interesting research question concerns the behaviour of different systems when distortion is introduced. Does the amplitude of the distortion actually increase as it is transmitted through additional subsystems; does it remain constant; or does it decrease and if so why?

These are only a small number of the issues yet to be resolved in systems theory and this paper has attempted only a beginning in one area. The answers to the remaining questions are left to the diligence of future generations of M.B.A. students.

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