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A System Application to The Classical Functions of Managements

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A SYSTEMS APPLICATION TO THE CLASSICAL FUNCTIONS OF MANAGEMENT

by

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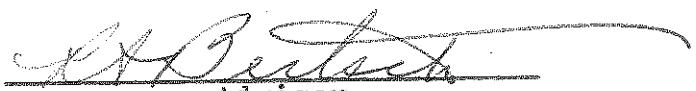
This independent research report submitted by Gregory A. Spilker in partial fulfillment of the requirements for the Degree of Master of Business Administration from the University of North Dakota is hereby approved by the Advisor under whom the work has been done.



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ABSTRACT

This study compares the traditional approach to the functions of management with the systems approach to these same functions. An examination and tabulation of classical management functions is conducted. This approach is then contrasted and compared with current innovations in the system concept of management. A model is developed to show how systems thinking applies in a classical structure. Overall it is concluded that the systems approach does have validity of application.

CHAPTER I

INTRODUCTION

Problematic Statement

Even as this paper is being written, more applications for the systems concept of management are being discovered. This is true because more and more managers are becoming aware of the many situations to which this field of concentration can be applied. Many advocates believe this approach can validly be applied to the management concept in total. An attempt will be made to demonstrate how the systems concept can be applied to several universal concepts of management; namely planning, organizing, and controlling. The objective is to establish that a valid correlation exists between the systems approach and the classical approach.

Research Methodology

Secondary source material was utilized through library research in conducting this report. Text material, journals, independent research papers, and reports were examined to obtain material for this study.

Scope

This paper will concentrate on the systems approach to management and how it can be applied to planning, organizing, and controlling. A more in-depth analysis of the systems concept will be undertaken wherever subject matter must be clarified for better understanding. This study is not a detailed analysis of the systems concept, but rather a general illustration of how it might be applied to current management functions.

Plan of Presentation

Chapter II presents a general overview of the system concept. Chapter III details several applicable aspects of the systems concept. Chapter IV considers the question of planning. Chapters V and VI presents an example of how the above mentioned subjects can be applied. Chapter VIII is a restatement. Chapter IX contains the summary and conclusions.

CHAPTER II

THE SYSTEMS CONCEPT

What Is A System?

"A regularly interacting or interdependent group of items forming a unified whole." This is the definition given by Webster. Upon close examination of this statement two facts become obvious. One, a system is composed of a group of items. Two, they are joined together in some way to form a cohesive unit. The systems approach recognizes and attempts to interrelate the two. The group of items is realized for its part within the system. The second aspect, mainly the joining together or relationships, is also of primary interest.

For example, in recent times the study of business has been divided into many branches; finance, accounting, marketing, manufacturing, etc. The relationships between these fields of concentration has been neglected. The system approach attempts to relate these units to one another. This overview or interrelationships of the business is a main function of the systems approach.

Kenneth Boulding points out that as yet no concrete principles exist which can classify general systems as a body of doctrine. In its current application it is considered

more as a point of view. Several characteristics pointed out by Boulding are worthy of note.

1. "The general systems advocate desires order and uniformness over disarray.
2. The world is more interesting if viewed as an orderly array.
3. The systemsist looks for laws governing laws.
4. Mathematization and quantification are desired to aid in establishing order."[1]

The systems advocate views the whole from both the point of structure and the process of interrelation.

Early Systems

"Jack of all trades, master of none," thus was a person characterized in an era of specialization. This aspect of advancement was necessary at a certain point in the development of many of the sciences. Man, however, has run the circle. He stands once again at the beginning. Initially man divided science into its individual parts, ie; chemistry, biology, physics, etc. Now the time has come for a look at science per se. The entire range must be studied, the relationships examined. This process has begun in modern times. We have bio-chemistry, electro-chemical engineering, and a host of others.

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[1]Kenneth Boulding, "General Systems Theory: The Skeleton of Science" Management Science (April, 1956) pp. 197-208.

The Greeks began the idea of dividing a concept into its parts for ease of analysis. This process once begun is difficult to reverse. It is only in more modern times that man has had both the inclination and the tools needed for amalgamation. The interrelationships have begun to emerge as a study in themselves. This is an important aspect of the systems concept.

Systems Theory and Management

"Essentially management is the process whereby unrelated resources are integrated into a total system for objective accomplishment."[2] The management process by its very nature is essentially a system. The conducting of a business through the interaction of multitude facets is a perfect environment in which the systems approach can be utilized. The systems concept views an organization as a complex entity, composed of subsystems within subsystems, each contributing to the total operation. An important addition can be made to Webster's definition of a system, namely the interacting components accomplish an objective according to plan. This definition points out an important aspect of management. The aspect of planning. The system has a purpose or objective which is met

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[2]Johnson, Kast, Rosenzweig, The Theory and Management of Systems, (McGraw-Hill Book Co., N.Y., 1967) p. 14.

by proper planning. This is not a new concept, rather it is one of the foundations of the classical management process. The systems concept also views it as one of its basics, but goes beyond the classical method in its application. If a plan is established, the method of meeting its goals must be organized. Organization then is a second major area of concentration. To ensure that all facets are maintained in proper status quo, control becomes the third area of consideration.

CHAPTER III

SYSTEMS DYNAMICS

Open and Closed Systems

Daniel Katz and Robert Kahn suggest in their book The Social Psychology of Organizations that classical organization theory is becoming unsatisfactory for management of human and social factors. They state "The development of open system theory furnishes a much more dynamic and adequate framework."[3]

An open system is one in which outputs that are caused by the inputs are isolated from, and have no affect on, the inputs. It is obvious then that the feedback or information flow is not included in an open system. Because of this fact, an open system is not aware of its own performance. That is to say, inputs are not controlled or modified by any factors internal to the system. An outside influence is necessary to adjust the input/output relation.

An essential element of a closed system is feedback. Because this is such an important aspect of a closed system,

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[3]Daniel Katz and Robert L. Kahn, The Social Psychology of Organization, (John Wiley and Sons, Inc., N.Y., 1966) p.vii.

it is often referred to as a feedback system. A closed system has a structure that channels results from its own actions back to influence future action.

The closed system can be subdivided into different classes; positive and negative. Negative feedback is similiar to management by exception. Acceptable parameters are set and when the tolerances fall outside of these, corrective action is taken. Positive feedback is akin to dynamic management. That is, decisions generate growth, and as a result of this action, still greater growth is achieved.

Feedback Loops

"An information feedback system exists whenever the environment leads to a decision that results in action which affects the environment."[4]

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[4] Jay W. Forrester, The Impact of Feedback Control Concepts on the Management Sciences, (Lecture October 27,1960, Foundation for Instrumentation, Education and Research, N.Y.)

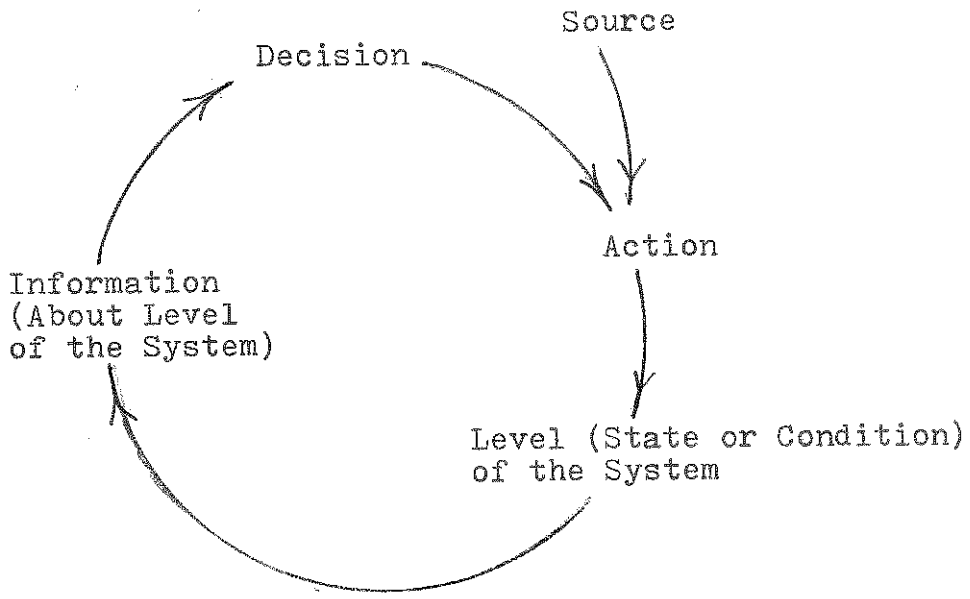

Fig.1 Basic Feedback Loop [5]

Forrester describes the feedback loop as a closed path connecting in sequence a decision that controls action, the level, (the state or condition of the system) and information about the level of the system, the latter returning to the decision making point.[6]

The feedback loop then can be seen to be the basis for

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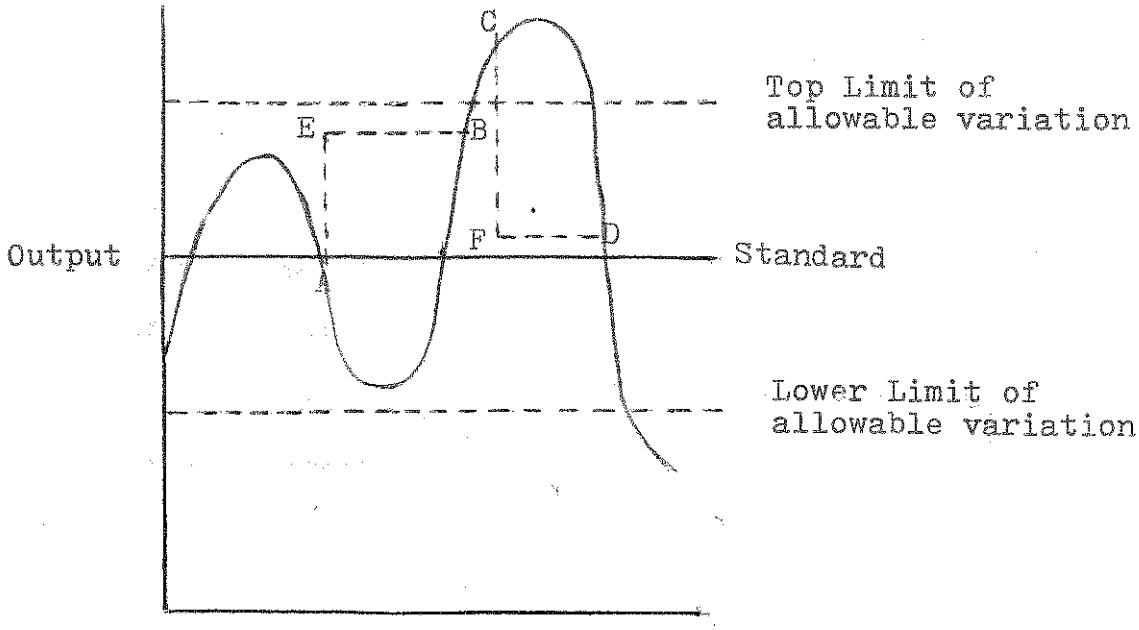
[5]Jay W. Forrester, Principles of Systems, (Wright-Allen Press, Inc., Cambridge, Mass., 1968) p.1-8.

[6]Ibid. p.1-7.

the decision making process. Because of the nature of the systems concept, two different levels appear. Each of these levels must be considered in developing and using this approach. The first level is the true level of the system. This is the present state of the system as it appears in an instant of time. The second level is the apparent level of the system. The apparent level is what an observer perceives upon investigation. The difference is caused by the time lag in information flow. What an observer sees as present status is, to the system, past history. Because of this time lag, oscillation occurs in negative feedback loops. The greater the time lag between measurement and action, the greater the oscillation. The most critical condition occurs when the delay is exactly one-half cycle. If corrective action is taken at this point, then over-reaction occurs, and the wave is amplified, (see fig. 2). The solution rests on two factors; one, the change, and two, the rate of change. With the advent of management information systems these measurements have become much easier to obtain. With the almost instantaneous reaction time of the computer, oscillation can be eliminated almost entirely.



A= Point where direction of output is recognized
B= Corrective input is added
C= Error is noted-directive to remove resources
D= Resources are removed

EB and FD= Information time lag

Fig. 2 Oscillation and Feedback[7]

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[7]Richard A. Johnson, Fremont E. Kast, James E. Rosenzweig, The Theory and Management of Systems, (McGraw-Hill Co. N.Y. 1967) p. 88.

CHAPTER IV

PLANNING

Definition

"Planning is the process by which the system adapts its resources to changing environmental and internal forces. The purpose of the planning function in an organization is to provide an integrated decision system which establishes the framework for its activities."[8] In the past planning has been done on a limited scale. As business organizations grow in size and complexity, more difficulty is encountered in coordinating the actions of each department to insure company policies are met. Because of the complexity of this function the most advantageous method of coordination is to view the organization as a total system. With this concept in use, the organization can be viewed in entirety and the actions and reactions necessary for planning can be balanced.

Types of Plans

Before actually discussing different types of plans, a word should be said about goals and objectives. Goals represent the end point of planning. Without a goal or

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[8] Ibid p.21

objective the planner has nothing to work toward. Plans are divided into two basic groups: 1) Plans for repetitive action. 2) Plans for nonrepetitive action. Each of these types of plans may be either proceedural or declarative. Plans for repetitive action are known as policies, or standard operating proceedures. These plans are designed to aid the organization in handling situations which arise frequently.

Policies are the most general plans or guide lines which govern planners in their duties. The other type of plan is the "ad hoc" or single use plan. A situation may arise for which no plan has been formulated. Often this type of plan is for a special detail within a long range plan. Both types of plans can be either proceedural or declarative. A proceedural plan shows a step by step set of actions necessary for frutification of the plans. A declarative plan specifies only the desired outcome. With this type the planners are expected to find the most appropriate method which will accomplish the desired objectives.

Because of the scope of this function, the systems concept has validity of application. To approach planning with some hope of understanding, three basic divisions are suggested by Johnson, Kast, and Rosenzweig.

1. "The environmental system sets forth the broad social, cultural, political and economic parameters in which the business must operate.

2. The competitive system describes the industrial structure, competitive relationships for the particular industry in which the company competes.
3. The internal organizational system indicates the organizational structure, objectives and policies, and functional relationships, which make the business a unique system."[9]

All three systems above exist as seperate entities. Each, however, also exists as an integral part of the planning system. Coordination in terms of information flow is of paramount importance in the systems concept. Business firms are becoming aware of the importance of environmental concepts in two ways. First, the traditional aspect of the word, namely the environment in which the business operates. Factors such as state of the economy, value of the dollar, and consummer demand must be considered. Secondly, the actual definition of the word environment must be considered. Factors such as air and water pollution, government rules, and regulations on these points and consummer interest are intrinisically involved in any planning.

Planning must take into account the competitive system. Both short and long range plans must be viable enough to adjust to changing strategies in the business world. Such factors as rate of return and share of the market must also be considered.

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[9] Ibid. p. 34.

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[9] Ibid. p. 34.

The third system, the organization itself, is the most intrinsic of the three. The goals and policies must be set. The means to accomplish these designs must be coordinated. The efforts of all departments must be channeled to achieve desired ends.

Within and among the three systems listed , exists an almost unmeasurable amount of interface. It would seem impossible to calibrate and coordinate all this information. With the advent of information technology, using the computer, this information can be correlated and applied. This application, in essence, is the systems approach. The organization and its environment are not viewed as a collection of activities, but rather as a system in which the flows and interactions determine the management forces needed.

Applications of Systems Concepts in Planning

The systems approach has been used for some time, with limited application. PERT and its many offspring are an application of this technique.

Simulation and Industrial Dynamics using the computer and mathematical models, respectively, are again uses of systems in managing.

Another field which is an intrinsic part of systems, namely operations research, has recently come of age. Herbert Simon has constructed a fairly comprehensive model of this approach. (See Fig. 3).

Types of Decisions	Decision-Making Techniques	
	Traditional	Modern
Programmed: Routine, repetitive decisions. Organization develops specific processes for handling them.	1. Habit 2. Clerical routine: Standard operating Proceedures 3. Organization structure: Common expectations A system of sub-goals Well-defined informational channels	1. Operations Research: Mathematical analysis Models Computer simulation 2. Electronic data processing
Nonprogrammed: One-shot, ill-structured novel policy decisions Handled by general problem-solving processes	1. Judgment, intuition, and creativity 2. Rules of thumb 3. Selection and training of executives	Heuristic problem solving techniques applied to: a) Training human decision makers b) Constructing heuristic computer programs

Fig. 3 Traditional and Modern Techniques of Decision Making[10]

[10] Herbert A. Simon, The New Science of Management Decision, (Harper and Row, Inc. New York) p.8.

CHAPTER V

ORGANIZATION

Definition

The business organization is a man-made system. Men, money, and materials are combined in an integrated framework to accomplish desired outcomes. Thus the organizing function is a realistic application of the systems concept.

Traditionally, organization theory emphasized the segments of the business. It dealt with activities or tasks in seperate operational units. The aspect of the interface between these units was all but forgotten. The systems application emphasizes the relationships among and between these units. It views the task of organizing as a whole rather than as a series of units. This can be accomplished because of the use of the computer.

The purpose of the manager is to "organize" the component parts of the business into a cohesive whole.

This organizational concept is exemplified by a new system of management known as Rhochrematics. This operation combines all aspects of material buying, producing, and selling into a cohesive whole. When considering the business as a system, care must be taken to include all applicable subsystems. Most of these are fairly evident; purchasing, production, payroll, etc.

Since the systems concept is concerned with subsystems and their interfaces, the next natural step in analyzing the organizational concept is to study the interrelations between the subsystems in the organization. E. Wight Bakke has developed a set of criterion to view the interrelationships in a social organization.

1. The parts should be recognizable as variables essential to the achievement of end result characteristics of an organization or its parts.

2. The parts should be related to the whole by reference to a common characteristic having a necessary and logical functional relation to the performance of the organization's function.

3. The parts should be so defined as to indicate their logical and necessary functional relation to each other and to the whole, and not merely to suggest their usefulness as a set of categories for classifying variables.

4. Major parts should be capable of subsumming all elementary parts necessary to the explanation of organizational behavior.

5. The parts should have necessary relation to the behavior of all participants in the organization.

6. The kind and pattern of interaction among the parts should indicate an unbroken continuity of reciprocal relations from individual participants, through systems of activity, to the surrounding environment.[11]

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[11] E. Wight Bakke, Concepts of the Social Organization (John Wiley and Sons, Inc. N.Y., 1959) p. 35-36.

This criterion enables a manager to develop a general system reference.

The importance of the environment must be considered in organizing. The system adapted must be flexible enough to meet the requirements set by changing surroundings. Factors such as competition, market value, state of the economy will have a direct effect on the organization. The system, through feedback should be constructed to reach equilibrium under varying conditions.

When using the traditional tools of organization, line and staff functions are developed to facilitate decision making. The use of the computer as applied to information systems has changed this arrangement somewhat. The necessity for decision makers has lessened because fewer men are able to correlate more information. The function of a large portion of the line and staff personnel now are used as policy advisors who act as supplements to the information-decision system.

Organizing the Informal Work Group

One subsystem which is often overlooked in organizing is the informal organization. This is a subunit which must be considered as it can increase or decrease workers response under different conditions.

The systems approach must be developed in conjunction with current management techniques. Apparently then, this approach should not be viewed as an alternative, but rather as an extension. Current management thought on the development of the informal organization potential must be incorporated into any new management approaches. By its very essence, the systems approach is a assemblage of parts forming a complex whole. One of the parts that few authors consider is the amalgamation of the informal work structure into the formal systems structure.

The feedback concerned with informal work group activity has become of significant importance to management in recent years. Many managers would be loath to surrender this input, and rightly so. The systems approach can, and is designed to, accept this facet and organize it into the management process.

Lawrence and Seiler recognized the importance of the feedback loop in conjunction with many other aspects of the work environment. These facts are brought out in their discussion of the informal organization.

"All the behavior considered so far, namely, the required activities, interactions, and sentiments, and the given sentiments, then, are theoretically determined by a set of "back-

ground factors" over which members of the group have little or no control, namely, their own personal characteristics and backgrounds, external economic and social influences, management policies and practices, the supervisor's behavior, the technology, and job design. The first two columns of Figure 4 attempt to represent the more important influences existing between these background factors and the required and given elements of behavior. One of the most important influences on management policy is the "feedback" received from the eventually emerging productivity, satisfaction, and individual development of the members of the group. Among the results of this feedback, for example, may be a management decision to modify the technology."[12]

The Feedback Loop (see fig. 4) could easily be structured to give feedback to a master planning committee who could evaluate this input and measure its effect on expected results. Johnson, Newell, and Vergin propose a model of an operating system suggesting three levels of organization to aid in the planning function.

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[12]Paul R. Laurence and John Seiler, Organizational Behavior and Administration, (Irwin and Dorsey Press, Homewood Illinois, 1965) p. 159

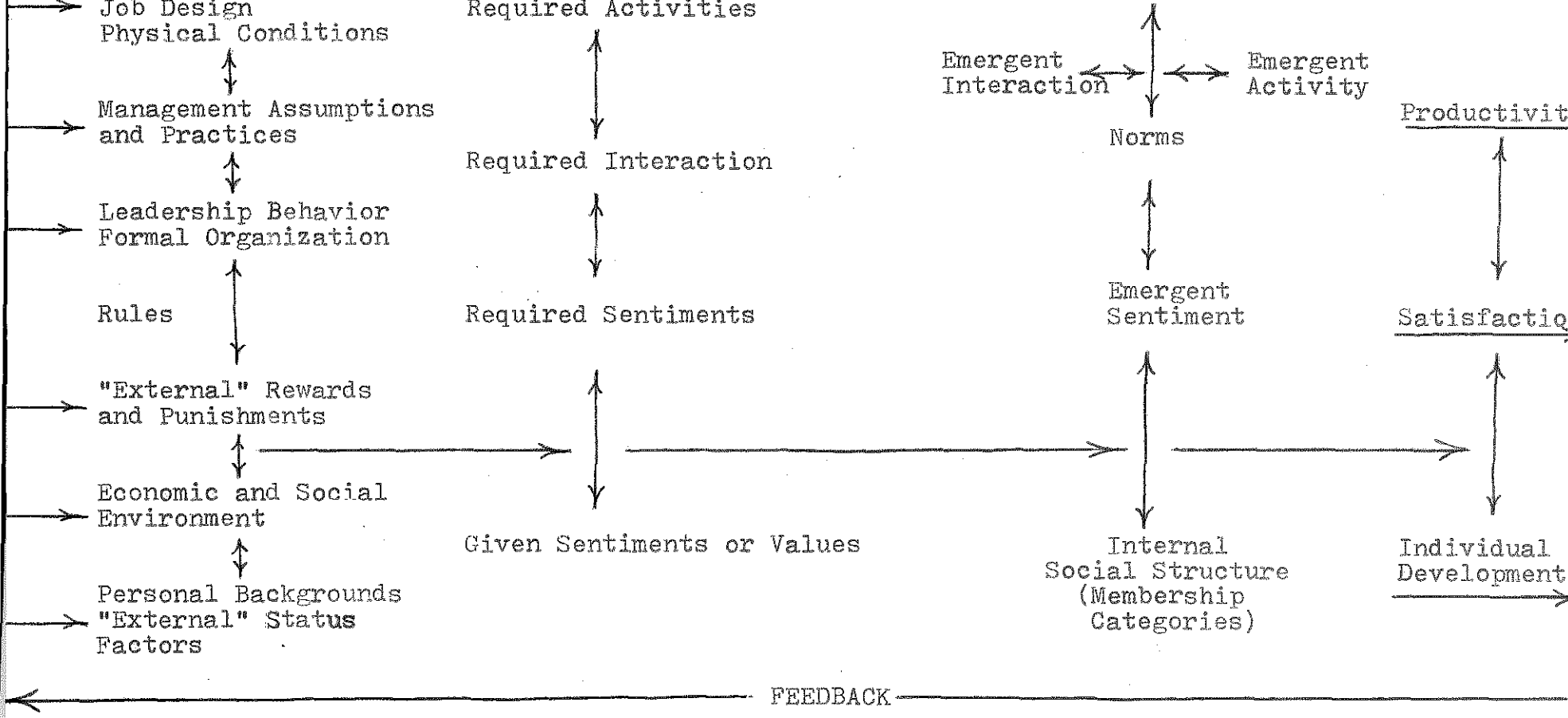

Fig. 4 Work Group Behavior
Relations Between Elements of External and Internal Systems[13]

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[13]Source: Paul R. Laurence and John Seiler, Organizational Behavior and Administration (Irwin and Dorsey Press, Homewood, Ill., 1965) p. 158

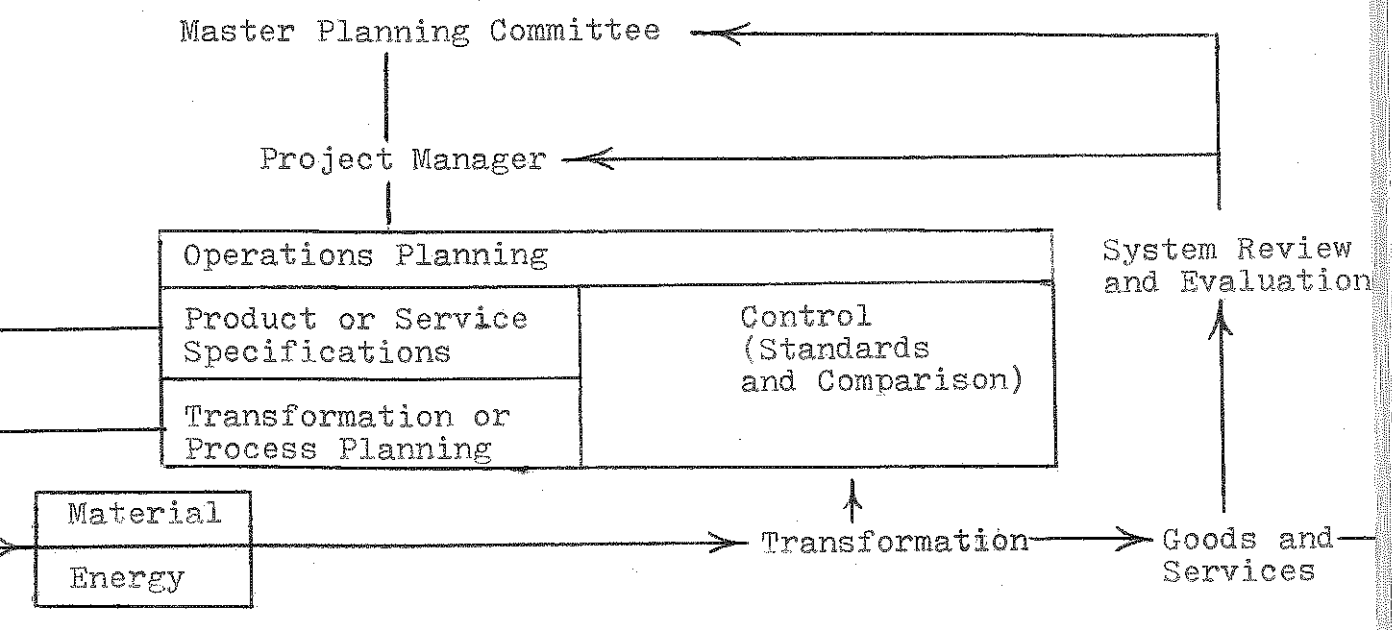

Fig. 5 An Operating System[14]

This model can readily accept the addition of the informal organization input. Johnson, Newell and Vergin go on to suggest a structure:

"The Master Planning Committee considers inputs relating to the demand or need for the product or service, the present state of research and development technology, the resource capability of the organization, and other influences generated by the environment. At this level, decisions are made concerning

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[14] Johnson, Newell, Vergin, Operations Management (Houghton Mifflin Co., Boston, Mass., 1972) p. 505.

the selection of new programs, and the expansion or discontinuation of existing programs. Once such decisions are made, the actual design and creation of the system are delegated to a resource allocation group. Specific inputs of manpower (energy), facilities (materials), and systems technology (information) are combined as necessary to plan and assemble new systems, or to make major revisions in existing systems."[15]

The feedback information from the informal organization can be injected at several levels depending on where the optimum usage of the information exists. The Master Planning Committee should consider worker reaction to changes in methods of production, job design, and management policy. In general any aspect of the environment in which they work. The group norms then, must be included or recognized by any planners who hope to ensure smooth adoption of proposed changes.

C. West Churchman emphasizes the important aspect of including all people involved with an operation in the planning stage. He suggests the following:

"As a beginning in thinking about the objectives of a system, it is natural to ask whose objectives are to be served. Since we will be assuming that the answer to this question

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[15]Ibid. p. 504

is in terms of certain people, let's call the set of all such people the "customers" of the system. The customers, in other words, are the people who should properly be served by the operations of the system. In the case of an industrial firm, the "customers" are not only the people who buy the products but also the employers, the stockholders, and perhaps interested sections of the public."[16]

This point is further reinforced by Johnson, Kast, and Rosenzweig. "Informal social groups have a dominant role in any culture. Moreover, they have an important bearing on the study of large business systems. The importance of these small, informal groups within the larger organizational system was indicated in the famous Hawthorne-Western Electric studies. These studies suggested that worker output and performance were as strongly influenced by the norms, standards, and rewards of the informal work groups as they were of the more highly structured formal organization. The large, complex organization is built upon the foundation of a number of more informal interrelated group activities. Here again, the overall system--the business organization, is a composite resulting from the interaction of a number of subsystems."[17]

It can easily be perceived that the informal organization is an intrinsic part of the complex business structure and as

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[16] C. West Churchman, The Systems Approach, (Delacorte Press, New York, 1968) p. 184

[17] Richard A. Johnson, Fremont E. Kast, James E. Rosenzweig, The Theory and Management of Systems, (McGraw-Hill Co., N.Y. 1967) p.49

such must be dealt with. The traditional concepts of management have recently come to acknowledge this as can be seen from the production facilities of Volvo and Ralston Purina.[18] The systems approach because of its structure, can and does include this important subsystem in the planning, organizing, and controlling functions.

[18] In these plants, teams have been developed to handle the production problems, within certain parameters.

CHAPTER VI

CONTROL

Definition

The accepted basics of control are fairly widespread. They consist of measurement of an output, the comparison of this output with some standard, and the adjustment of inputs to gain equilibrium. This is accomplished by means of a "feedback loop" which relays information necessary for control.

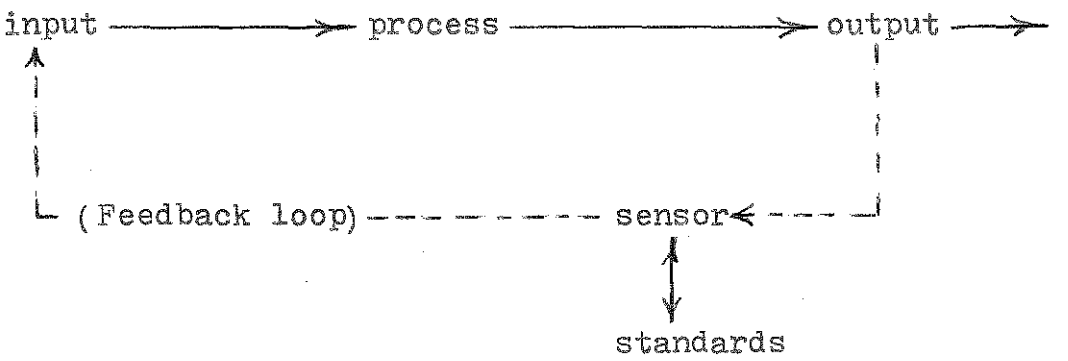


Fig. 6 Basic Control with Feedback Loop

Because of a characteristic of this system, namely, the control unit can be located a considerable distance from the system itself, this can be used as an efficient management tool. The advent of the computer has enabled the manager to control much more than his predecessors did. The computer can monitor the output, compare and adjust the input, with

no action being taken by the manager. The computer can also be programmed to monitor output and inform the manager whenever deviation is detected.

The two examples above illustrate two basic types of control systems; a closed-sequence, and an open-sequence system. In an open-sequence system, some factor outside the system (the manager) is necessary for adequate control. That is the system will only function with the intervention of something outside the system itself. In a closed-sequence system, control is excised in terms of internal reaction. The measurement and regulation by the computer, all internal actions, make this a closed system. The classic example of this type system is the home thermostat, which continually adjusts the temperature of the home to within prescribed limits.

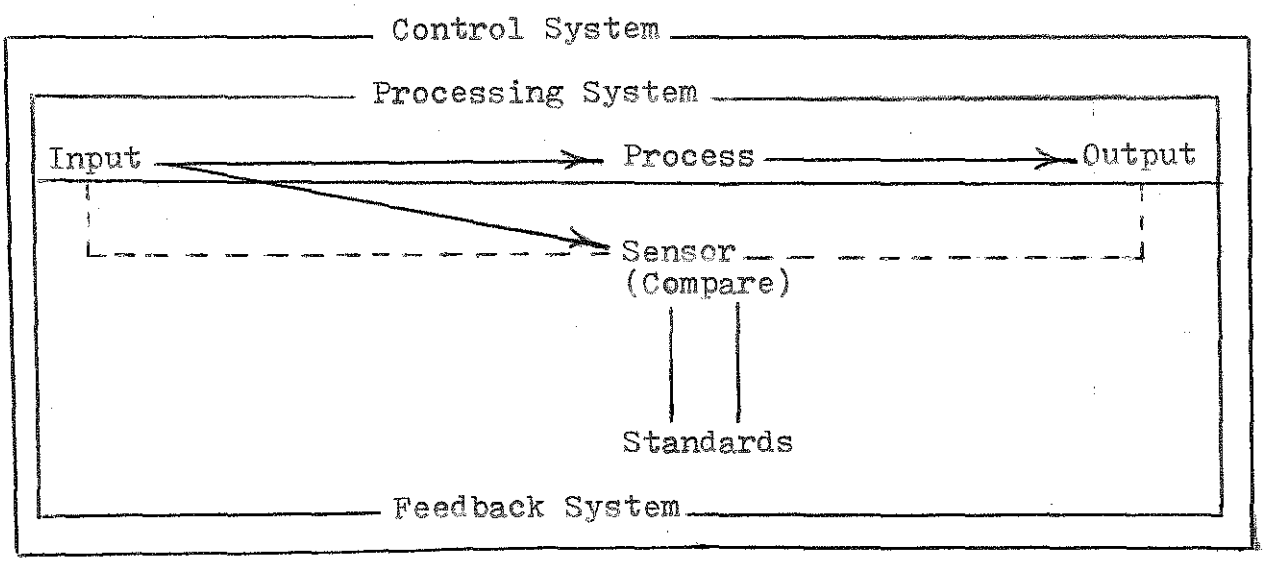


Fig. 7 Control System

This chart can be used to explain the operation of a closed loop or feedback system. The thermostat will be used for familiarity of comparison.

The input is the amount of time the furnace operates in terms of air, gas, and electricity. The process is the heating of the air itself. The output is the amount of warm air expelled. The sensor is the temperature sensitive spring of the thermostat. The standard is the temperature value set in the thermostat dial. The thermostat with its associated wiring is the feedback system. The furnace is the processing or operational system, and combined they form a closed loop control system.

In some cases the processing system can be regulated at several points. If the input must be of an exact nature before processing, a subsystem complete with its own feedback loop can be developed as seen in the control system figure. The subsystem begins with the input, then the sensor to the standard, back to the sensor, and finishing with the input.

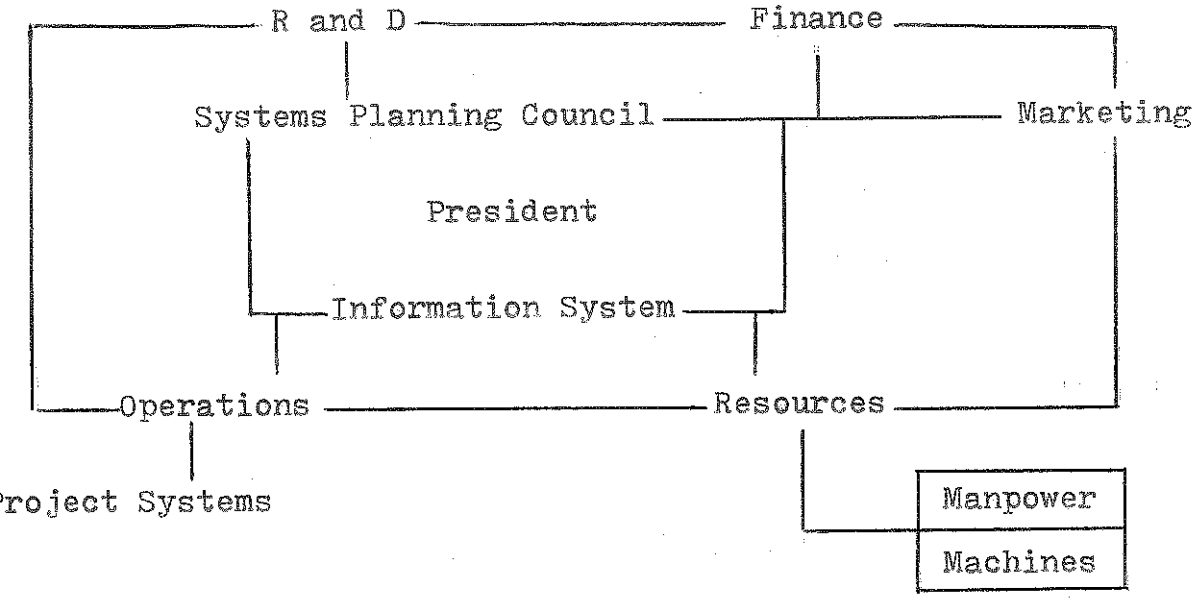
A word of caution should be made at this point. Control is not the sole objective of the systems application. A system is implemented to perform a specific task. The function of control is to regulate some aspect of the system to insure the desired output.

CHAPTER VII

APPLICATIONS

Model Development

A relatively simple model can be developed which will show the application of planning, organizing, and controlling.



Note: All lines represent information and feedback channels.

Fig. 8 Systems Model

Planning

Planning occurs at several major locations in figure eight. The highest level planning is done by the systems planning council. This council would be the most pure systemists in the organization. They would be in a position to view the

corporation as a total system. This committee would establish broad policies and company goals. It decides on new product lines and hiring of top level executives. This unit coordinates the external inputs from the environment with internal information to insure total system observation. This circle of planners insures that the company can face novel or unusual situations with relative impunity.

The second sphere of planning expands to include the general divisions of the company. Research and Development, Finance, and Marketing exist as seperate systems within themselves, yet with an intrinsic connection to the company, as a system, which must be coordinated. Operations and resources also exist as system, but in addition to themselves they are part of a system of subsystems which operate within their sphere. For example; once a decision has been made by the planning council and passed to operations and resources for implementation, several subsystems are activated. Within the resources circle, systems for manpower and machinery allocation must be established and coordinated. Within the operations section, a plan or program must be designed and implemented for each decision received.

The third planning level is that of the individial project. A workable system must be drawn up to meet the limitations set, yet still accomplish the desired objectives.

This stage uses such techniques as operations research, model building, and computer simulation, to perform its task.

Because of the capabilities of the new information technology, the systems planning committee can monitor the actions of all the implemented subsystems and coordinate them to achieve any desired goal.

Organization

The systems concept of organization emphasizes the interrelationship between the subsystems operating within the structure. For this reason, the traditional alienation which inevitably builds up between line and staff must be avoided. A smooth information flow must be maintained for effective systems utilization.

Figure eight illustrates several circles of organization. The systems planning council has the overall responsibility of organization. The activities of the support divisions are organized and coordinated with the aid of the council. Each specialty is a system in itself thus they must all be integrated for complete utilization. The role of the planning council becomes clearer then if one sees it as organizing these individual systems into a larger system to form the company.

Another organization system is the resources system composed of machine and manpower subsystems.

A third basic system, operations, ensures the organization of a project team to implement any decisions from the planning council. The fact that operations and resources are handled as indiviual systems, leads to an advantage of the systems concept. Because there is a central point or pool of control, resources can be allocated to different projects almost without delay, if the need arises.

Control

Since all actions of a company to do (or not do) something involve time; time to discover the need for a decision, time to decide what to do, and time to implement it, control of the time factor would seem to be of paramount importance. This is a major asset of the systems concept. Because of the interconnection of subsystems and continued supervision of the outputs of these systems, control can follow immediately any deviation from desired objectives.

The information system which should be an integral aspect of the systems planning council continually, by means of information technology, monitors all the systems under operation. This technology utilizing the computer can maintain

a constant update on information, energy levels, materials, and outputs of all major systems. When an abnormality or shortage is discovered immediate control actions can be implemented to reduce lag time to near zero.

CHAPTER VIII

TODAY AND TOMORROW: A RESTATEMENT

Within the last hundred years management theory has undergone several major revisions; classical, behavioral, quantitative, ad infinitum. Each school has its advocates who would support their schools teachings to the extent of ignoring all others. ".....planning, organizing, controlling, and coordinating."[19] Fayol ".....planning, organizing, staffing, direction, control, innovation, representation."[20] Dale ".....the functions of management are planning, organizing, staffing, directing, and controlling."[21] Koontz

Statements such as these are responsible for much of the current thought and teachings concerning management. In the same vein, the organization has long been viewed as a pyramid; telescoping downward from a president or chief executive, to the workers at the base. These types of definitions and relationships have served a purpose in organizing and structuring the management process. They do describe the status of relationships among and between segments of the organization.

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[19] Constance Storrs (translation) General and Industrial Management, (Isaac Pitman and Sons, 1916) p. 12

[20] Management: Theory and Practice, (McGraw-Hill Book Co., N.Y., 1965) p.5

[21] Principles of Management, (McGraw-Hill Book Co., N.Y., 1968) p. 34

Further refinement is needed if management is to continue to grow. Beckett states this succinctly. ".....it is clear that most views of organization are really structure views of the system; that is, they speak only to the question of what the system would look like if it were stopped, for an instant, and photographed as if by stroboscopic light. There is no harm in attempting to comprehend system structure; it is worthy of thorough study and careful design. But process, the action by means of which the stroboscopic picture at one instant in time becomes something different the next time the light flashes on; is inseperably related to, and certainly no less important than, structure. The vital, dynamic, operating process is what we are trying to understand. Since we have for so long focussed upon status, it is time that we give process its fair turn."[22]

Oskar Lange states this process of change in slightly different terms. "A system of active elements therefore, is endowed with its own specific mode of action, "a law of motion", consisting in the transformation of the input and output states of the elements. This mode of action is a feature of the system as a whole for it depends not only on the mode of action of the individual elements, but also on the structure of the system; ie., on the network of couplings of the elements."[23]

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[22] John A. Beckett, Management Dynamics, The New Synthesis, (McGraw-Hill Book Co., N.Y., 1971) p. 145-146.

[23] Oskar Lange, Wholes and Parts, A General Theory of System Behavior, (Pergamon Press Oxford, 1965) p. 31

The systems approach attempts not only to view the management structure, but also the interacting roles which exist between subsystems. These subsystems exist not only within the organization, but also in the external environment. Systems thinking attempts to view the organization as a living complex. This is why the systems school of thought has validity in modern times. It does not seek to replace established schools of thought, but rather to extract and amalgamate applicable concepts into a new way of viewing the environment. The systems concept embodies all modern management tools, research quantitative methods, human interrelationships, and most other techniques developed to aid in the management process. The systems view, however, is more than all these things combined. In itself the systems approach brings with it an expanding viewpoint, that is to say, it provides the user with the ability to view factors as a combined reactor on the system. The manager learns to realize the extent to which subsystems react to form a system. This realization in itself is a product of the systems approach.

With the development of this concept, a better use of the classical functions can be undertaken. Planning, organizing, and controlling will continue to be basic tools of management, but perhaps the application of these instruments will be improved because of the expanded viewpoint of the systems approach.

CHAPTER IX

SUMMARY AND CONCLUSIONS

How can you end a discussion on systems when it has been stated that this is a dynamic on-going process. To end it would be a hypocracy and in reality the thoughts continue as the pencil stops. This is not an end, but mearly a chapter. It is a subsystem of ideas helping to organize the systems thought process which is developing at this moment.

A major advantage offered by the systems approach is wide-angle vision. That is, a systems architect can view the organization as a system. Being unencumbered by the traditionalist's views of classical structure permits the viewer to see new possibilities. Another contradiction arrises which will be difficult to rationalize. There are no experts in the field of systems. By its very definition a profession requires a specialized field of study, this implies limits or boundaries, ie., specialization. The systems approach seeks to encompass a multitude of specializations. Hence, if someone becomes a specialist in the systems approach, he does not truely practice what he preaches. An infinite cage. If any characteristics are desired, they are a willingness to look for new methods. A rejection of accepting things because "that is the way they are."

Finally it must be remembered that systems have existed since before man. Man's coming has not changed these systems. The changes only come from man's mind. The changes come from new perceptions and observed solutions.

To have this research project mean anything, it should be rewritten tomorrow. Systems are changing, the process is continuing, different facts are emerging. Concrete facts and structures cited in this report are valid for this report, and nothing else. True systems (to site a premise which is hypocritical but necessary) faces each situation and attempts to gather all salient facts and view them in an organized manner. This manner, however, is different for every instance and every individual. Hence, every reader of this study has to view it as a subsystem to be arranged in a new manner to fit the readers needs.

One can only hope that the reader will perceive the fact that there is nothing concrete about the systems concept, not even this statement.

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