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ANALYZING SOCIAL SYSTEMS:
THE SOCIOTECHNICAL APPROACH

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 ANALYZING SOCIAL SYSTEMS:
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ABSTRACT

An analysis of a social system requires, in addition to data-collection instruments, an organizing paradigm by which the data can be made to depict the system as a unified, functioning entity. The Parsonian model of social systems is applied to organizations. Four basic social subsystems, goal attainment, adaptation, latency, and integration, are discussed along with data-collection techniques. Some data can be obtained with formal instruments, others only with more casual techniques. The technology employed by an organization affects all four subsystems; it should not be looked upon as a monolithic subsystem by itself. There is a particular sequence of interaction among the four subsystems, beginning with goal attainment and ending with integration. This has implications for organizational diagnosis, design, and development.

ANALYZING SOCIAL SYSTEMS:
THE SOCIOTECHNICAL APPROACH*

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Anyone concerned with the study of organizations is entitled, if not doomed, to bewilderment when it comes to analyzing the organization as a social system. This is especially the case just where it ought not to be -- in the work of the sociotechnical school, where considerable attention has been given to developing methods of analyzing technical systems. The result is that we are able to specify in considerable detail the requirements that the technical system of an organization places on its social system, but we have no adequate way of describing that social system, let alone identifying its characteristics. We encounter such correct but hardly helpful statements as "social systems respond in their own characteristic ways and through the dynamics of social systems."

When some attempt at analysis is made, it tends to take one of three forms. First, nearly all sociotechnical literature at least draws comparisons between different forms of work organizations on the basis of some measure of social costs, such as absenteeism, turnover, sickness, accidents, and so on. These are useful indicators of social system functioning; they are not in themselves tools of analysis. The second approach to analysis is to be found in the behavioral science literature, in terms of job satisfaction and kindred topics. It is, of course, through questionnaire and interview, an attempt to analyze attitudes to various aspects of the work situation and to expose individuals' motivations. While useful for purposes of comparing

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attitudes before and after planned or unplanned change, or for comparisons between different departments or different organizations, it is of little value in tracing the dynamic relationships among elements of the social system. The third approach is to seek to describe the structure of an organization in terms of some dimensions of bureaucracy. While this approach rests on a somewhat more solid theoretical base--the Weberian treatment of bureaucracy--is of questionable value for diagnosis or design of social systems.

Nor have there been lacking taxonomies of leadership or management styles or modes of functioning. Nor have we lacked studies of power relationships and communications which have sought to draw general conclusions from case material. We can therefore piece together quite a formidable array of knowledge, methods, and techniques. But if we were to assemble them all into one giant kitbag, what would it avail us? Would we be able to make sense of the ensuing data, to describe, characterize, analyze, and predict the behavior of an organization's social system? Not in our view, unless we have some organizing paradigm into which our data can be fitted. Such an organizing paradigm does exist.

Parsons (1960) has described how any social system, if it is to survive, must perform four basic functions -- goal attainment, adaptation, integration, and latency (or pattern maintenance). He further points out that each of these basic functions is performed by a subsystem so that one may speak of a goal attainment subsystem, an adaptation subsystem, and so on. Parsons' treatment is complex and mostly at the societal level of analysis, where institutions can be identified as forming part of each subsystem. (Crudely, we can see political institutions as forming part of the goal attainment subsystem, economic institutions within the adaptation subsystem, judicial within integration, and educational within latency). The goal attainment subsystem is that set of structures which allows a system to produce goods and

services. Adaptation is the process whereby the system responds to changes in its environment so as to achieve its goals. Integration is the process whereby the activities of individuals and groups are combined into directional system activity, thus it involves the resolution or containment of conflict. Latency (pattern maintenance) is concerned with the filling of roles in the system, ensuring the supply of people with the knowledge, skills, and motivations required to perform the roles.

Now of course at the organizational level of analysis, we shall not encounter an "adaptation department," a "latency department," etc. Instead we see planning departments, project departments, personnel departments, training staffs, and so forth, in which repose the main responsibility for one or another of the four basic functions. Thus planning departments are expected to handle the main tasks of adaptation; selection and training contribute the formal aspects of pattern maintenance and so on. Still, anyone who has spent a week in an organization knows that not all planning activity originates in the place reserved for it on the organization chart. Neither is all learning handled by formal training procedures; indeed the informal initiation which members receive often contradicts the formal instructions: "You can forget what they taught you in the training department." The task at hand for any social system analysis is to map the structures in which the necessary social system functions do indeed get carried out, and to look at interactive relationships within and between the subsystems.

INSTRUMENTS FOR PROBINGTHE SOCIAL SUBSYSTEMS

It is not our intention to propose another standardized organizational assessment package, nor do we believe that there could ever exist a single best set of instruments for social system analysis that would be appropriate for all organizations in all settings. Instead, what we present below is a sample of methods by which social system configuration and functioning may be systematically probed.

Let us first consider the gross aspects of the relationship between the organization and the community which is its environment. As observers, we shall quickly note the physical aspects of the face the organization presents to its environment -- open or closed, welcoming or forbidding. From our point of view, the question would be: Does the organization, by the physical arrangement of its site and buildings, emphasize or minimize the distinction between its members' organizational roles and extraorganizational roles, between their work lives and their nonwork lives? Even before entering the doors for the first time, we may well have observed in the parking facilities the degree of status separation between visitors and members and among classes of members (directors, managers, staff, workers, etc.).

The Goal Attainment Subsystem

Critics have noted Parsons' failure to distinguish between goal setting and goal attainment. While these two are indeed conceptually distinct activities, attempting to construct an analytic schema based on that distinction amounts to nothing less than the proverbial can of worms. We therefore, for the purpose of analyzing social systems, treat goal setting as part of the goal attainment subsystem.

Unlike whole societies, with very complex and diffuse sets of goals,

an organization usually has more specific goals. In fact, most organizations' goals are directly related to their central technologies -- a paper company makes paper, a rent-a-car company rents cars, etc.

For the sociotechnical systems school, the analysis of unit operations (Davis and Engelstad, 1966) is essentially an analysis of the goal attainment subsystem. There are two phases in this analytic instrument. The first phase is the identification of unit operations, a unit operation being an identifiable change in the state of the product being made or the service being rendered. For example, in making tea, the heating of water is one unit operation, the steeping of tea in hot water is another unit operation, and so on. Unit operations characterize the work to be done, not the jobs or equipment that do that work. The second phase is the identification of variances -- things that go wrong, variable states that exceed a standard or tolerance -- in each unit operation. The second phase also includes an examination of how the variances interact, and certain "key" variances become evident as most critically affecting quantity, quality, and costs. A more detailed explanation of unit operations analysis is to be found in Taylor (1975), and the relationship of unit operations analysis to design criteria is discussed in Cherns (1976).

The Adaptation Subsystem

The adaptation subsystem is made up of the various capacities with which the organization and its parts deal with environmental and internal turbulence. A sleek cat prowling about a dangerous jungle is a highly adaptive organism; a lumbering Rube Goldberg machine (for British readers, Heath Robinson) is so specialized as to be totally unadaptive. The task of the adaptation subsystem is to enable the organization to maintain its performance in the face of environmental change without modification of its goal attainment subsystem. Essentially, the raison d'etre of the social

system as a whole is to protect its breadwinning goal attainment subsystem. But as we know, at least as much energy is often directed to protecting the interests and integrity of the departments into which it has been divided.

One of the most widespread mechanisms of adaptation is the use of specialists to rechart organizational specifications whenever anything new is encountered. The Hawthorne studies showed, however, that much adaptation is performed by workers and work groups themselves, often secretly. Hedberg and Mumford (1975) created an instrument to assess the relative degree to which planning specialists (engineers, systems designers, etc.) as against operating workers are predominant in the adaptation process. The Hedberg and Mumford items tell us the values and assumptions under which the organization is set up to deal with environmental change.¹ Their instrument is presented in Figure 1.

-- INSERT FIGURE 1 --

Indirectly, the ease with which workloads are fluctuated reflects the adaptation system. Indices such as overtime, fluctuation in earnings, and fluctuation in shiftworking, however, should be used with skepticism, as they may reflect adaptation to fluctuating employee needs for work as much as the ability of the organization to adapt to fluctuating demands for its product. There is perhaps a need to develop a new measurement to account for this.

Needs for adaptation may be met by a variety of mechanisms. Among these are some intended to be of a strictly temporary nature -- task forces, temporary organizations, committees; others are planned as regular, durable features -- periodic internal audits, planning and budgeting meetings designed

1. Although these involve design principles which pervade the entire organization, they are presented under adaptation because they bear the most effect in that subsystem.

to monitor and regulate adaptation, etc.

The degree to which the function of adaptation is entrusted to formal rather than informal, permanent rather than temporary, mechanisms is an indicator of the extent to which environmentally-originated variations are likely to be dealt with by adaptation or dealt with as problems of latency or integration.

The Latency or Pattern Maintenance Subsystem

One of the most notable aspects of human organizations is their amazing resilience in the face of changes in role occupants, shifts in day-to-day moods, etc. This is achieved by the latency or pattern maintenance subsystem. All organizations exist within a social environment, and thus one of the principal functions of the social system is to maintain the equilibrium between members' roles within the organization and their roles outside the organization. This relationship is bound to be complex and not at all easy to analyze. At the simplest level, we might have a firm which is virtually the sole employer in a "company town." At the most complex, we may imagine a branch of a large multinational firm in an industrial park of a large metropolis. In any case, we need to know the sociographic characteristics of the community and its labor market, and the makeup of the workforce of the organization. Subjective data are valuable in giving added depth concerning members' external sources of role identity. Not all the answers to these questions can be obtained without giving offense, or indeed, without breaking the law. This may constitute a challenge to the ingenuity of the analyst of social systems. If, for example, all the members of one occupational or religious group are to be found within one department, any conflict of interest between that group and other groups may be fought out on the organizational stage as a conflict between departments. So, too, differences in work values and habits have often been described among workers of rural

and urban backgrounds. The closeness in which the organization is linked to its social environment may be assessed from the density of extra-organizational interactions among its members. Figure 2 offers one method of assessing this.

-- INSERT FIGURE 2 --

Analysis of the latency subsystem begins with describing the mechanisms whereby the organization manages time sharing between inside and outside roles. Some of these mechanisms include variable work weeks, flextime, staggered shift working, child care facilities, sick leaves, vacation scheduling, transportation arrangements including carpools, and access to organizationally owned boundary-spanning equipment such as telephones and vehicles. One organization is known to have lent alarm clocks to new recruits from an economically disadvantaged area.

Another function of the latency subsystem is to provide for succession in the occupancy of organizational roles. Latency is thus concerned with recruitment, selection, training, indoctrination, and career management. Over the course of industrialization, social systems in general have undergone a changes in the values underlying the occupancy of social and occupational roles. The basis on which roles have been occupied has evolved from ascription by birth to achievement. But nowhere is this transition complete; many sons still aspire to follow their fathers into managerial or occupational roles. The cultural prescriptions of the community in which the organization is located have to be taken into account as well as the prescriptions of management doctrine. The latency subsystem has therefore to acquire people with the capacity to fill the roles in the organization, to equip them with the relevant skills, both occupational and social, and to maintain their motivation to occupy the roles in the manner required by the organization. These requirements have led to the development of considerable educational and training functions within organizations, especially management development wherein management doctrines are imparted.

Popular indices of social system functioning tap into the latency subsystem -- turnover, absenteeism, tardiness, etc. (See Figure 3). Note that

the indicators are, by themselves, meaningless, unless anchored into some subjective context: turnover may, for example, merely reflect social mobility, rather than alienation! Turnover is sometimes purposely programmed into a social system, such as "up or out" policies: It is necessary to analyze turnover and related indices not only by noting the actual rates, but also by noting the patterns by which roles succeed each other within individuals.

-- INSERT FIGURE 3 --

Looking a bit more closely at latency, we realize that discipline -- the positive connotation of "academic disciplines" as well as the negative connotation of punishment -- is involved. The relative degrees to which discipline originates within an individual, through peer pressure, through personal supervision, and through impersonal monitoring of performance is often readily visible to the observer in an organization. The more that discipline originates from individual and peer sources, the more it is presumed than an organizational member is "involved" in, and not "alienated" from, his job. The sociotechnical school of thought (as well as other schools) further presumes that such individual and peer-derived discipline is associated with certain characteristics of jobs, as indicated in Figure 4.

-- INSERT FIGURE 4 --

Mumford (1972) applied a "contingency" or "fit" approach to job characteristics, based on individuals' expectations. This is shown in Figure 5.

-- INSERT FIGURE 5 --

The requirement to maintain the necessary motivations is met primarily by the reward (compensation and evaluation) systems. Many of these are rococo structures, accommodating layers and residues of past agreements and embellished with ornamental figures which offer prestige rather than more tangible rewards. A rash of vice presidential labels may be cheaper than advances in salary, but may prove costly to the system in generating false

expectations. Yet, the proliferation of voluntary organizations proves that money is not the sole unit of reward.

Of the four subsystems we have been discussing, latency is the one with the "conservative" character. It is likely to be embodied as the "culture" of the organization: "this is not the way we do things around here." The guardians of the organization culture are not necessarily those who occupy the highest echelons, as became clear when the senior author listened with astonishment to the Board of Directors of a company (whose name is a household word) complaining about the power of the "Establishment" in the company to oppose change. At first glance, it would seem that if there were ever an "Establishment" in the company, the Board of Directors was it! But upon closer inspection, it was seen that the Directors consisted mostly of people who had entered their high positions from outside, or who had represented innovative forces inside. The guardians of the old company values were a block of senior middle management. Directors could decree ends, but the company culture determined the acceptable means; acceptable means were rarely direct paths to the ends.

An organization's culture comes alive in its "mythology," the canonization of historic events and noteworthy personalities who founded and transformed the company. Whether or not the myths are in any sense true, they express organizational values, and beliefs in the myths is their affirmation.

Each specialism, each department, seeks to maximize its own function, making optimization of the whole system more difficult. Part of latency is group loyalties and group distinctions, as for example, the distinction between the conformity in dress typical of sales personnel and the many forms of individualism characteristic of R & D departments.

The Integration Subsystem

Organizations, once differentiated into pattern-maintaining departmental units, require coordination so as to act with unity of effort. These capacities reside analytically within the integration subsystem. Each department, seeking to maximize its own function, makes integration of the whole system more difficult. Integration is sometimes visualized as people talking to people (by telephone, in meetings, etc.); integration is also traditionally thought of as the job of middle and upper management, acting as pivotal points in a hierarchy.

As the organization grows in size and complexity, painful transitions occur, of which perhaps the most searing is the supersession of face-to-face communication by paper. Faced with requirement to provide off the top of his head an estimate of the "ideal" size of organizational units, an internal consultant canvassed his colleagues in a number of the firm's plants with the question, "When was paper substituted for conversation?" The answers he received showed remarkable agreement; in all cases the transition occurred when the number of people in the plant reached 3000 (a figure about three and a half times what we would have predicted),

Although integration is essentially composed of interaction among members of the organization, it does not necessarily follow that all interaction rises out of needs for integration. It is necessary in analysis to distinguish those interactions which derive directly from the ways in which the work is organized from those which come from mere membership in the organization. This aspect of interaction is addressed in the instrument proposed in Figure 6. There is always some degree of ambiguity in categorizing interactions; if I am employed in a support role, say in the pay office, the task-based interactions that I undertake are largely with company employees, yet for those employees the same interactions are not task-based at all, but merely organization-based

(according to the definition given in Figure 6).

-- INSERT FIGURE 6 --

A dominant factor in determining the density of interaction is the size of the organization. With only five members we can predict that everyone relates to everyone else in all three categories of interaction, and quite frequently. In an organization of 5000 members, each probably interacts with a comparatively small proportion of the whole. But strikingly different patterns are still possible. It can turn out that people tend to interact with the same people in each of the modes of interaction or with a whole range of different people in each mode.

Integration, since it is achieved by paperwork as well as by direct interaction, should be analyzed by cataloguing various organizational forms, reports, accounting memos, and their routes.

Inasmuch as hierarchy is a prominent means of integration, ways have been devised to chart hierarchial relations in an organization. One approach used by Scott (1953) to assess people's perceptions or "mental maps" of the authority hierarchy is shown in Figure 7. Of course, the official organization chart is just one conceptual map of that authority hierarchy, although a privileged one. Even in such a tight bureaucracy as a naval submarine crew, Scott found many discrepancies among members' perceptions of its structure. In a governmental rehabilitation unit, Edwards (1971) discovered such egregious variation as to suggest that the notion of authority structure is less well understood than we imagine.

-- INSERT FIGURE 7 --

Finally, integration may be achieved by a relatively solidified system of committees or teams; those operating at the lowest level of the organization are often termed "semiautonomous work groups." Following Gulowsen (1972) we present in Figure 8, a method of assessing the degree to which this

method of integration is used in an organization.

-- INSERT FIGURE 8 --

Since integration is threatened by conflict, the integration subsystem must provide for its resolution and for mechanisms to adjudicate the disputes which inevitably arise. Grievance rates, strikes, slowdowns, stoppages, and so on, are indicators of conflicts which break surface, but such data have to be interpreted in the light of the meanings attributed to them, by the parties in conflict and by organizational "bystanders." More or less formalized procedures exist in organizations for consultation, participation, and settlement of conflict. Sometimes these procedures are handled by representative bodies such as works councils and grievance committees. In other cases these procedures are established by groups of shop stewards and so on. In a few organizations there are quasi-legal codes of members' rights. No analysis of a social system could be complete without information as to the explicit and implicit mechanisms of conflict resolution.

Typically the integration subsystem is not itself integrated; policies and structures for communication may in some ways be at variance with those for decision making, for conflict resolution, etc. These incongruities become evident when looked at through the lenses of the Parsonian model of social system analysis as we have presented.

The Organization's Own Mode of Assessing its Social System

Many of the indicators we have discussed here are in fact maintained within organizations' own recordkeeping procedures. Most organizations have figures showing absenteeism, tardiness, sickness, and so on, which primarily characterize the functioning of the latency system. We mention the organization's own records not so much as a timesaving resource to the social system analyst, but because these records have an interactive effect upon the social system itself. The dominant indicator for the organization as a whole

may be a global return on investment. Departments figure in "costs" rather than "returns," and cannot easily relate their performance to such global indicators; they therefore tend to acquire local or internal indicators of their own "productivity" which often measure success in maximizing only certain parochial objectives -- "suboptimizing." Thus people concerned with performance appraisal may adopt as a measure interviews conducted per head; trainers use man-weeks of training per head, and so on. Such measures may serve to justify their existence and do no harm thereby, but may and often do serve to obscure their contribution to the organization and the functioning of the social system. In this way they contribute to the problems of integration and latency.

RECONCEPTUALIZATION OF THE
ROLE OF TECHNOLOGY

The technology employed by an organization can affect all four subsystems and should not be seen as the sole "property" of any one of them. The moving transfer line in assembly technology, for example, functions to pace workers (latency) as well as to insure coordination of work (integration). An analysis of an organization's technology, then, can tell us much about the social system that will be necessary to operate it. Likewise, an analysis of a social system using concepts such as those presented here will tell us what technological characteristics would be best suited for it, and what social characteristics would have to be changed so as to suit a given technical design. The analysis of unit operations, previously discussed as a way of describing the goal attainment subsystem, presents the overall objectives around which the actual technology and social system must be detailed; it is not then in itself an analysis of the technical system per se, any more than a listing of quality of working life desiderata is an analysis of the social system.

Each of the four subsystems employ various technologies. The central technology of the organization -- the production apparatus mainly -- lies in the domain of the goal attainment subsystem. The use of various planning techniques and marketing technologies, as well as apparatus for product design, falls into the domain of adaptation technologies. Latency technologies include programmed instruction equipment, timeclocks, etc. And integration technologies consists of telephones, computerized budgeting techniques, and so forth. It is beyond the scope of this paper to delve into a detailed analysis of technical systems; however, we cannot overemphasize that while technical phenomena and social phenomena are very different beasts, they are engaged in a mutual cause-and-effect relationship in most organizations.

INTERACTION OF THE SOCIAL SYSTEMS

We have come to see a particular sequence of interaction among the four subsystems, which can be outlined as follows. A social system seems to "inherit" its goal attainment subsystem; rarely does a company change its line of business (although it often redefines it), and only in full-fledged revolution or invasion does a society change its basic institutions (although it often invents new terms to describe them). In the case of brand new companies or societies, the goal attainment subsystem is usually derived from an idea, either entrepreneurial or utopian. Changes in the system's environment, rarely dealt with by the exceedingly stable goal attainment subsystem, are then the charge of the adaptation subsystem; adaptation mediates between the system and its environment. Adaptation only in extraordinary circumstances effects changes in goal attainment; ordinarily it initiates modifications in the latency subsystem -- new training, new recruits, layoffs, discipline, and even the creation of new specialities and new departments. Increasing the number of roles, or altering the content of existing roles, requires subsequent adjustments in the integration subsystem -- and the buck stops there. This sequence is diagrammed in Figure 9.

-- INSERT FIGURE 9 --

Lawrence and Lorsch (1967) implied part of this sequence by noting that integration follows differentiation, which in turn follows differences in environmental segmentation.

The interaction of the four subsystems can be characterized as a process of "variance" transmission and control, analogous to the concepts of variance as used in unit operations analysis described previously in this paper. A variance, it will be recalled, is a troublesome condition, a deviation beyond a normal tolerance, that a system must control if it is to

function properly. If a variance originates in one subsystem, it may be controlled in the same subsystem or be transmitted to the next subsystem in the sequence for control there. For example, a fluctuation in the labor market represents a variance in the environment which, if not controlled by environmental institutions such as unions or government, must be controlled by the adaptation subsystems of employing organizations. Here is another illustration. A shifting product demand requires action on the part of the adaptation subsystem. One such response is to try to stabilize the environment. Another response is the transmission of the problem to the operational departments (the latency subsystem); another is the creation of a new department. The creation of a new department now presents new needs for integration of the whole organization, and this burden manifests itself as a "communications problem." We know of one instance in which this was met by the creation of a communication department! Such a transmission of variance from the environment through the adaptation and latency subsystems to the integration subsystem reinforces the familiar maxim of consultants: the presenting problem may have its roots in some hidden "real" problem. Al Capp once remarked that the easiest way to control the rising crime rate is to make everything legal (i.e., the latency subsystem refusing to accept variance transmitted to it from the adaptation subsystem).

An illustration of the failure of an adaptation subsystem to cope with environmentally-originated variance has been given by T.T. Patterson (unpublished paper). A Glasgow firm undergoing a series of unforeseen crises reacted to each in turn by redrawing its organization chart. In the course of eighteen months, the responsibility for the R & D department was reposed in no fewer than nine different functional divisions; at one time it found itself reporting to the company secretary!

Clearly, the most desirable way to deal with variances is to control them as close to their source as possible. Yet this is not implied in the principles of bureaucracy and scientific management. A planning department, ever mindful of the changing environment, presents constant variance, in the form of changing patterns to be maintained, to the operating departments. As planning, training, supervising, and operating become more and more separated from each other, the lines of variance transmission become longer and longer, and the linkages of variance control become unwieldy. The familiar symptom of "red tape" is the usual result.

Efforts at job enrichment, team building, work groups, and socio-technical design are aimed at establishing links between shifting environments and integrated organizational activity. Redundancy of skills, while wasteful when seen from within the latency subsystem, is a way by which the adaptation subsystem can more successfully function without thrusting undue variance upon the latency subsystem. Team working is again unappreciated from the internal perspective of the latency subsystem, yet it is a way to control variances that would otherwise burden the integration subsystem. Proper design of the technical system instrumentation (location of meters and readouts, etc.), although sometimes seen differently from a strictly engineering viewpoint, is a way to deal with variances that goal attainment might impose upon adaptation. And of course, the design of jobs and roles so as to facilitate career paths and to enhance quality of working life is a way to control variances between adaptation (with respect to cultural and labor market environments) and latency.

We can seek to design our social systems so that problems ("variances") are constructively dealt with, instead of evoking responses which trigger future problems elsewhere. This does not imply the institution of "latency"

departments, integration departments, and so on. It does imply that we must assure that these functions are identified, their operation analyzed, and their weaknesses attended to. But before we can design we must analyze. The suggestions offered in this paper are a beginning.

FIGURE 1

Assumptions Underlying Designs and Operation of Organization

Sources of data for this instrument: managers, supervisors, systems designers, engineers, workers, researchers' observations.

Adapted from Mumford and Hedberg (1975)

The Typical Worker

- | | | |
|---|--|--|
| A. Leaves other people to make most of the decisions on things which affect them at work. | : <u>1</u> : <u>2</u> : <u>3</u> : <u>4</u> : <u>5</u> : <u>6</u> : <u>7</u> : | Will protest if they are not consulted on all matters which affect them at work. |
| B. Capable of handling only a limited range of tasks in their job. | : <u>1</u> : <u>2</u> : <u>3</u> : <u>4</u> : <u>5</u> : <u>6</u> : <u>7</u> : | Capable of doing a job involving a variety of different tasks. |
| C. Not concerned about having social contact at work. | : <u>1</u> : <u>2</u> : <u>3</u> : <u>4</u> : <u>5</u> : <u>6</u> : <u>7</u> : | Regards opportunities for social contact at work as important. |
| D. Can tolerate boring work. | : <u>1</u> : <u>2</u> : <u>3</u> : <u>4</u> : <u>5</u> : <u>6</u> : <u>7</u> : | Demands interesting work. |
| E. Work best if the pace of the work is outside control. | : <u>1</u> : <u>2</u> : <u>3</u> : <u>4</u> : <u>5</u> : <u>6</u> : <u>7</u> : | Has complete control over the pace of work. |
| F. Needs or wants to have a well defined job (area of operation) which he/she sticks to most of the time. | : <u>1</u> : <u>2</u> : <u>3</u> : <u>4</u> : <u>5</u> : <u>6</u> : <u>7</u> : | Works well and enjoys working in a job (area of operation) which is not clearly defined. |
| G. Needs to be told what to do next and how to do it. | : <u>1</u> : <u>2</u> : <u>3</u> : <u>4</u> : <u>5</u> : <u>6</u> : <u>7</u> : | Can organize the sequence of work and choose the best methods. |
| H. Unable to undertake responsibility for decisions, and unable to take initiative. | : <u>1</u> : <u>2</u> : <u>3</u> : <u>4</u> : <u>5</u> : <u>6</u> : <u>7</u> : | Able to undertake responsibility for decisions, and able to take initiative. |
| I. Has a low level of skill and/or knowledge (expertise). | : <u>1</u> : <u>2</u> : <u>3</u> : <u>4</u> : <u>5</u> : <u>6</u> : <u>7</u> : | Has a high level of skill and/or knowledge (expertise). |

FIGURE 1 (CONTINUED)

How Jobs Should Be Designed

- | | | |
|--|--|--|
| A. Jobs should be clearly defined, structured and stable. | : <u>1</u> : <u>2</u> : <u>3</u> : <u>4</u> : <u>5</u> : <u>6</u> : <u>7</u> : | Jobs should be flexible and permit group problem solving. |
| B. There should be a clear hierarchy of authority with the person at the top carrying ultimate responsibility for all aspects of work. | : <u>1</u> : <u>2</u> : <u>3</u> : <u>4</u> : <u>5</u> : <u>6</u> : <u>7</u> : | There should be a delegation of authority and responsibility to those doing the job regardless of formal title and status. |
| C. The most important motivators should be financial e.g. high earnings and cash bonuses. | : <u>1</u> : <u>2</u> : <u>3</u> : <u>4</u> : <u>5</u> : <u>6</u> : <u>7</u> : | The most important motivators should be non-financial e.g. work challenge, opportunity for team work. |
| D. Job methods should be carefully defined by systems and procedures specialists, management services, or supervision. | : <u>1</u> : <u>2</u> : <u>3</u> : <u>4</u> : <u>5</u> : <u>6</u> : <u>7</u> : | The development of job methods should be left to the group and individual doing the job. |
| E. Targets should be set by supervision and monitored by supervision. | : <u>1</u> : <u>2</u> : <u>3</u> : <u>4</u> : <u>5</u> : <u>6</u> : <u>7</u> : | Targets should be left to the employee groups to set and monitor. |
| F. Groups and individuals should be given the specific information they need to do the job but no more. | : <u>1</u> : <u>2</u> : <u>3</u> : <u>4</u> : <u>5</u> : <u>6</u> : <u>7</u> : | Everyone should have access to all information which they regard as relevant to their work. |
| G. Decisions on what is to be done and how it is to be done should be left entirely to management. | : <u>1</u> : <u>2</u> : <u>3</u> : <u>4</u> : <u>5</u> : <u>6</u> : <u>7</u> : | Decisions should be arrived at through group discussions involving all employees. |
| H. There should be close supervision, tight controls and well maintained discipline. | : <u>1</u> : <u>2</u> : <u>3</u> : <u>4</u> : <u>5</u> : <u>6</u> : <u>7</u> : | There should be loose supervision, few controls and a reliance on employee self discipline. |

FIGURE 2

Density of Network of Relations, Interactions

Members of organizations to whom you are related
whom you know well
whom you know casually

by name
by department
by grade
by category
by age, sex, time with firm,
marital status

Proportion of time outside working hours spent with members of
organization

Proportion of time outside working hours spent with non-members of
organization

FIGURE 3

Indicators of Social System Functioning

Sources of data for this instrument: records where available, special recording by agreement.

- A. Turnover: by department
 by grade
 by category
 by age, sex, time with firm, marital status
- B. Sickness frequency, duration
 by classification as with "A" above
- C. Absence by classification as with "A" above
- D. Tardiness frequency, amount of time lost
 by classification as with "A" above
- E. Accidents type, severity, frequency
 by classification as with "A" above

FIGURE 4

Characteristics of Jobs in Terms of Quality of Working Life Values

Source of data: researcher's ratings after observation and interviews with jobholders.

1 = too much or too little; 7 = optimum for psychological satisfaction

Job: _____

Characteristics:

(i) Variety : 1 | | | | | | | | | 7 :

(ii) Challenge : 1 | | | | | | | | | 7 :

(iii) Autonomy & Discretion : 1 | | | | | | | | | 7 :

(iv) Learning : 1 | | | | | | | | | 7 :

(v) Integrity of Tasks : 1 | | | | | | | | | 7 :

(vi) Career Path : 1 | | | | | | | | | 7 :

(vii) Social Interaction : 1 | | | | | | | | | 7 :

FIGURE 5

Degree of "Fit" Between Workers and Organization

Adapted from Mumford (1972).

- Knowledge needs - How does an individual or group of employees want their skills and knowledge to be used and developed in the work situation.
- Psychological needs - To what extent does the individual or group have a need for responsibility, achievement, advancement, status or responsibility.
- Control Support needs - Does the individual or group want a high degree of control over how work is carried out, or do they prefer to be controlled by external agents such as supervision.
- What kind of support services does the individual or group require in the form of information, materials, supervisory or expert assistance.
- Task needs - How much of the following does the individual or group require in the tasks which they have to carry out:
- skill variety. The opportunity to use different kinds and levels of skills.
- autonomy. The opportunity to make choices and take decisions.
- task identity. The opportunity to work in a clearly defined, well integrated set of tasks with a long task cycle.
- task significance. The opportunity to do work which contributes significantly to the product or service which the organization provides.

FIGURE 6

Analysis of Interactions Among People

Sources of Data: Observation, Interview, Questionnaire.

With Whom	Nature*	Importance	Unity	% Time
MANAGERS in the same dept in other depts (specify)				
SUPERVISORS in the same dept in other depts (specify)				
SPECIALISTS in the same dept in other depts (specify)				
COLLEAGUES in the same dept in other depts (specify)				
PEOPLE OUTSIDE THE ORGANIZATION (specify)				

* Receiving information, conveying information, exchanging information, seeking information, clarification, receiving instructions, conveying instructions, seeking, instructions, giving advice, receiving advice, seeking advice, negotiating, receiving materials, etc., etc.

(FIGURE 6, CONTINUED)

Use this schedule of data for three categories of interaction:

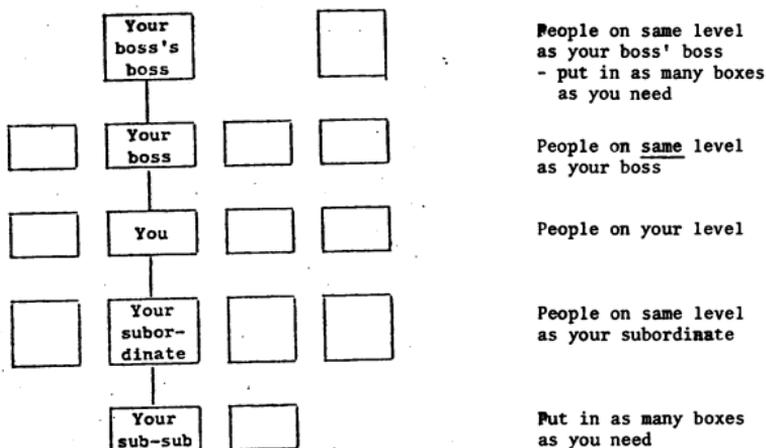
- (1) Task-based interaction -- communication or work transfer arising out of needs or tasks associated directly with the initiator's job or function in the organization.
- (2) Organization-based interaction -- communication arising out of needs or tasks not associated directly with the initiator's job or function, but still dealing with organizational business.
- (3) Personal-based interaction -- communication arising out of personal needs not really deriving from organizational duties, but between individuals who are brought into contact through membership in the same organization.

FIGURE 7

Mental Maps: Individual members' perceptions of structure roles.

Adapted from Scott (1953).

- a. Put in as many NAMES as you can on this chart.



- b. Now put in a line to show who reports to whom. For example, there is a vertical line between you and your boss. Draw a line between your boss and each of the people who report to him as you do.
- c. Draw in flows of information. Using red pencil, show the route through which the information you need to carry out your job reaches you. Show the route through which you send information that you have that other people need to do their jobs.

"Mental maps" are especially useful for identifying ambiguities and obscurities in the structure and discrepancies in mutual perceptions of roles.

FIGURE 8

Degree of Autonomy of Work Groups

Adapted from Gulowsen (1972).

Sources of Data: Observation, Interviews, Documents.

1. Degree of group's influence on the FORMULATION OF ITS GOALS
 - a. qualitative aspects : 1 _____ 7 :
 - b. (i) quantitative - volume : 1 _____ 7 :
 - (ii) quantitative - rewards and sanctions : 1 _____ 7 :

2. Degree of group's influence on CONDITIONS OF WORK
 - a. location : 1 _____ 7 :
 - b. timing
 - (i) total hours for group as a whole : 1 _____ 7 :
 - (ii) individual's absence : 1 _____ 7 :
 - (iii) overtime : 1 _____ 7 :
 - c. undertaking other activities : 1 _____ 7 :

3. Degree of group's influence on METHODS : 1 _____ 7 :

4. Degree of group's CONTROL OVER INTERNAL DISTRIBUTION OF TASKS : 1 _____ 7 :

5. Degree of group's CONTROL OVER MEMBERSHIP
 - a. selecting new members : 1 _____ 7 :
 - b. expelling unwanted members : 1 _____ 7 :

FIGURE 8 (CONTINUED)

6. Degree of group's influence over
LEADERSHIP

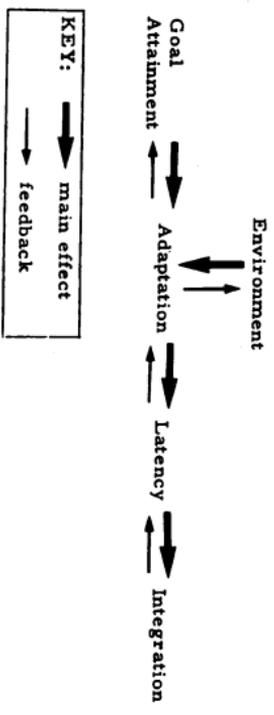
a. (i) whether internal leadership needed : 1 _____ 7 :

(ii) appointment of internal leader : 1 _____ 7 :

b. (i) how boundary conditions shall be regulated : 1 _____ 7 :

(ii) if "boundary" leader, choice of leader : 1 _____ 7 :

FIGURE 9. Sequence of Interaction Among Subsystems.



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