Henry Mintzberg

The Myths of MIS

"Total information systems" and similar concepts parading under different names, have been in vogue for some time. It is said that the computer will digest all relevant organizational information and send it back selectively and intelligently. Also in vogue with many information system designers, although probably not on a conscious level, is POSDCORB. This acronym, introduced by Luther Gulick in the 1930s, is supposed to describe the work of the manager—planning, organizing, staffing, directing, coordinating, reporting, and budgeting.

I propose to show that these are the two great myths in information systems design. They describe unrealized and unrealizable situations. POSDCORB is a vague and meaningless depiction of managerial work, with no link to the work of real managers. And the concept of a total information system designed for managers breaks down with POSDCORB. When one observes real managers, one quickly discovers that their activities (such as crisis handling) require a far different type of information than that suggested by POSDCORB. POSDCORB managers can work well with information systems as described in the current literature; real managers, as we shall see, cannot.
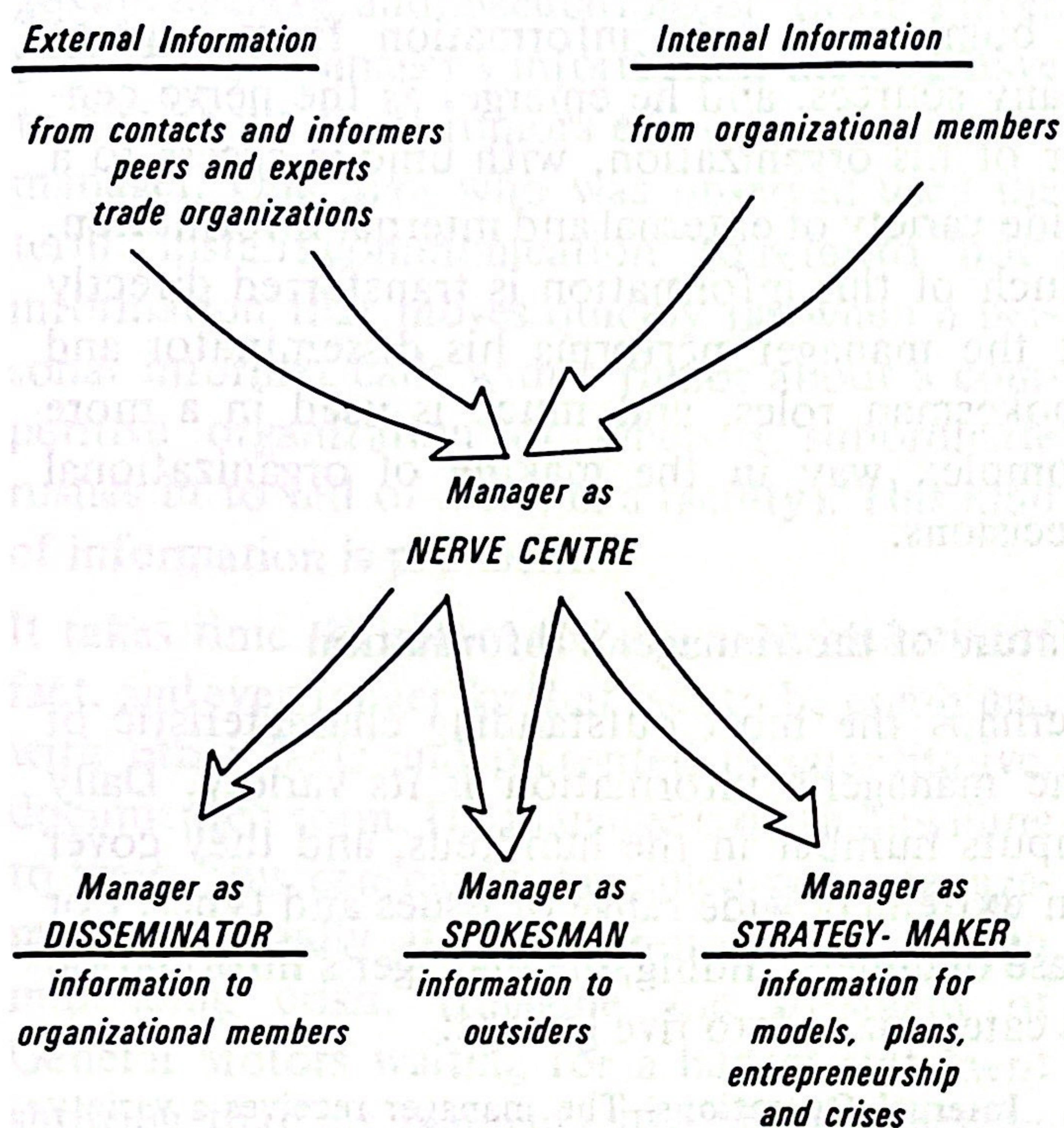
We begin with a description of the work of managers and the information that they actually use. With this knowledge, we can expose the myth of total information systems, and describe the requirements of management information systems that are designed for managers.

This article is based on some research conducted over the last few years. All the activities of five managers—the chief executives of large public and private organizations—were observed for one week periods using a method called "structured observation." Data were collected on every piece of mail (890 of them) and every verbal encounter (368 of them) during the five weeks. The resulting theory deals with the characteristics of managerial work, the managers' roles, and the managers' programs.[1] That part of the theory that relates to the manager's information-processing roles is described below. (Other parts, not discussed, describe interpersonal and decision-making roles.) Then the nature and characteristics of the manager's information are discussed.

The Manager as Information-Processing System

Managers (those people who head formal organization units) can logically be thought of as information-processing systems. If the five men

who were observed are representative, 75 percent of a manager's incoming mail and 40 percent of his verbal activities are concerned solely with the transmission of information (versus other activities where information transfer is secondary, such as making resource allocation decisions, receiving requests, scheduling time, engaging in ceremony). Since these five men spent about 78 percent of their time in verbal activities and most of the rest processing mail, we can conclude (again, if our five men are typical) that managers seem to spend about half of their time moving information.

Figure 1.—The Manager as Information Processing System

External Information
*from contacts and informers
peers and experts
trade organizations*

Internal Information
from organizational members

Manager as
NERVE CENTRE

Manager as
DISSEMINATOR
*information to
organizational members*

Manager as
SPOKESMAN
*information to
outsiders*

Manager as
STRATEGY- MAKER
*information for
models, plans,
entrepreneurship
and crises*

Information input—As shown in Figure 1, the manager receives his information from two basic sources—the external environment and the internal organization. Because of the status of his position, the manager is able to communicate with various well-informed people in his organization's environment. He interacts with many of his peers who provide him with useful information and he establishes formal communication patterns with a number of specialized groups

Henry Mintzberg *is Associate Professor of Management Policy at McGill University. He has worked in the field of operations research and has carried out a number of consulting assignments for various agencies of the Canadian Government.*

such as trade organizations, consultants, and lawyers. Furthermore, he maintains a system of personal informers, built up over the course of years, that feeds him with information on various environmental events and changes. It should be emphasized that only the top manager in an organization has access to many of these information sources.

In addition, the manager plays the central role in the flow of current internal information in his organizational unit. For one thing, the formal lines of communication connect the manager, and only the manager, to every member of his organizational unit. A second reason relates to the division of work in the organizational unit. Each subordinate is a specialist or administers a specialist function. The manager oversees all of these specialist functions; hence, relative to all his subordinates, he assumes the role of generalist. He may not know as much about any one of the specialties as the man in charge of it, but the manager is the only one in the organizational unit who is aware of activities and events in each of the specialist functions. Thus, he acts as a *nerve center* of organizational information. Three accounts, two from my own study and one from the work of Richard E. Neustadt, illustrate this nerve center role:

A company vice-president must leave a meeting on the west coast early. He and some colleagues were in the process of negotiating an acquisition. Shortly after the meeting ends, the vice-president, anxious to know the result, calls across the country to the president at headquarters in Boston. The president, who has just spoken to the other negotiators, describes the outcome. Later, in reply to the observer's comment, "So you are in Boston, they are both out west, yet you are in a better position to tell the vice-president what went on," the president comments: "I usually am!"

Someone in need of organizational information who does not know where to turn will call the manager or his secretary. An outsider, who has been switched from one telephone extension to another, finally asks for the secretary of the chief executive. Afterwards, she comments on her role: "If they can't answer a question from any part of the organization, call Norma—she can answer it!" In another, similar case, a manager comments after a meeting with a woman: "She didn't know where to go so she came to me."

The essence of Roosevelt's technique for information gathering was competition. "He would call you in," one of his aides once told me, "and he'd ask you to get the story on some complicated business, and you'd come

back after a couple of days of hard labor and present the juicy morsel you'd uncovered under a stone somewhere, and then you'd find out he knew all about it, along with something else you didn't know. Where he got his information from he wouldn't mention, usually, but after he had done this to you once or twice you got damn careful about your information."[2]

Who designs this internal and external managerial information system? To some extent it designs itself. That is, the manager receives much information simply because he is manager. Organizational members and various groups in the environment automatically send information to the highest authority of the organization.

But this does not explain the manager's entire information input. In large part, the manager designs and builds his own information system—he creates a system of informers and contacts both inside and outside the organization, and these people, in turn, regularly feed him with information. A third part of the manager's information system is designed by the information specialist.

Information output—the manager puts his information to a variety of uses. On the most elementary level, he simply disseminates a great amount of information to the person he thinks most appropriate to receive it. Much of this information, particularly that received from external sources, flows from the manager to members of his own organizational unit. For example, a president attends a board meeting and upon returning to his office, telephones a vice-president to pass on a bit of gossip picked up there.

Information flows through the manager in the opposite direction as well, that is, from inside the organizational unit to its environment. For example, the president tells a newspaperman about the growth plans for his organization, and he acts as organizational spokesman when the unit finds itself in a dispute with municipal authorities.

These are examples of relatively straightforward transmission of information. In addition, the manager performs some complex restructuring of his information, so that it can be used in decision-making. For example, it appears that every manager is a model-builder. He carries a great many models in his head which can be used to predict phenomena such as the influence of a price change on the sales of a product or the reaction of particular people to a certain kind of crisis. The manager also appears to carry a set of loose plans in his head—he knows in which general direction he would like to lead his organizational unit. These models and plans are built and are continually updated as the manager receives new information. In addition, the manager uses the information that he receives to initiate activity in his role as entrepreneur, and to react to disturbances in his role as crisis handler.

In summary, the manager can be described as a sophisticated information processing system. He is bombarded with information from a great many sources, and he emerges as the nerve center of his organization, with unique access to a wide variety of external and internal information. Much of this information is transferred directly as the manager performs his disseminator and spokesman roles, and much is used in a more complex way in the making of organizational decisions.

Nature of the Manager's Information

Perhaps the most outstanding characteristic of the manager's information is its variety. Daily inputs number in the hundreds, and they cover an extremely wide range of issues and types. For ease of understanding, the manager's information is categorized into five groups:

1. **Internal Operations**—The manager receives a variety of information on the workings of his organizational unit. Operating reports are sent regularly; subordinates advise him of events that take place in departments; he tours his organizational unit to observe activity.

2. **External Events**—Information on environmental events is relayed to the manager in many ways. Personal informers tell him of the actions of competitors, trade journals provide information on staff changes in customer firms, and so on.

3. **Analyses**—The manager receives analytical reports on a variety of subjects. Some are prepared at his request. Other reports, of a more general nature, are sent to him because he or his organization has at one time expressed an interest in the subject under study.

4. **Ideas and Trends**—From personal informers, from periodicals, and from meetings and conferences that he attends, the manager is informed of ideas (new products, new processes, new management aids, and so forth) and trends that occur in the environment (taste trends, pro-

jections of GNP growth, and so on).

5. Pressures—Various groups in the organization's environment attempt to influence the manager's decisions. Customers complain, owners demand, interest groups lobby, politicians persuade.

Most of the information that the manager seeks and uses conforms to a number of distinct characteristics. Specifically, this information tends to be current, to come in the form of "triggers," and to be transmitted by verbal media. These characteristics are discussed in turn:

Current information—Getting information *rapidly* appears to be more important to the manager than getting it absolutely *right*. This means that gossip, hearsay, and speculation constitute a large part of the manager's information diet. "I have to sift about forty rumors every day," said one manager. One man who was observed used the term "instant communication" to refer to "hot" information that moves quickly (as when a personal informer calls with a rumor about a competitive organization or when a subordinate rushes in to tell of a fire in a facility). This kind of information is prevalent.

It takes time for rumor to become substantiated fact, and even longer for that fact to be combined with other facts and presented in quantitative, documented form. The manager is often unwilling to wait. This can hardly be called poor management, especially if the rumor pertains to an impending crisis. (Imagine the president of General Motors waiting for a budget statement showing that his company had hired detectives to follow Ralph Nader.) The following memo is typical of the flow of rumors:

I hear via the grapevine that George will be transferred to Atlanta within a few months. I presume that he will be in charge of Wojeck's interests in the Atlanta area, but I will try to develop more information about this. In any event, this concern with special projects would indicate he might need our services from time to time. He has always been a good friend of ours and he should be a good man to know in the Wojeck organization.

To get his information quickly, the manager adopts a number of strategies. He freely bypasses formal channels in his organization, and he develops many sources of information, some unexpected, others perhaps devious.

Trigger information—The manager clearly prefers to have his information in the form of concrete stimuli or triggers, not general aggregations. Neustadt, in commenting on the information needs of three U.S. Presidents, concluded:

It is not information of general sort that helps a President see personal stakes; not summaries, not surveys, not the bland amalgams. Rather . . .it is the odds and ends of tangible detail that pieced together in his mind illuminate the underside issues put before him. To help himself he must reach out as widely as he can for every scrap of fact, opinion, gossip, bearing on his interests and relationships as President. He must become his own director of his own central intelligence.[3]

Thus, toward the end of the one week of observation, a manager looked at the first piece of "hard" mail he received all week—a standard cost report—and quickly put it aside with the comment: "I never look at this."

The managerial environment is one of stimulus-response. Managers lack the time and the inclination to dig through data. They seek triggers to action. Thus, the manager must be viewed not as a reflective planner but as an adaptive information manipulator who prefers the live, concrete situation.

Verbal information—There is strong evidence that managers prefer to work with verbal media, that is, with the telephone and the meeting. Mail processing appears to be a bore for the manager. This is not surprising when one considers that an analysis indicated that only 13 percent of the managers' mail in the study was of a current, trigger nature which required immediate important action. These managers disliked generating mail, and they said so. They claimed to prefer face-to-face contact and they supported these claims by their actions. Only one piece of mail was self-initiated (not a reaction to a piece of mail received) for every twenty-six received.

In general, the mails appear to be used for formal documents and formal requests, for lengthy correspondence and reports (often of marginal interest to the manager), and for general external information. The informal means of verbal communication—the telephone and the unscheduled meeting—are used to transmit information that cannot be delayed. And the formal means of verbal communication, the scheduled meeting, is used for formal activities such as ceremonial events, or for time-consuming information transfers such as briefing sessions.

In summary, since there is strong indication that the manager prefers current trigger information, he comes to accept much gossip, hearsay, and opinion and orients himself toward verbal means of communication. These characteristics of his information put the manager in conflict with most formal information systems. *While the manager seeks trigger, speculative, current information, the formal system usually gives him aggregated, precise, historical information.* Furthermore, the managers in this study suggested by the questions they asked and by the activities they chose to engage in that they had a strong need for external information. But formal systems generally provide only internal information. As a result, the manager must often ignore the formal information system. Instead, he designs his own system which provides him with the information that he believes he needs.

Unfortunately, the manager's system is a crude one. It is subject to his time limitations, which are severe and, because it is largely verbal, the system provides inadequate coverage (the manager can keep properly informed only those subordinates who are close to him, provided he has the time). The system breaks down when information must reach those who are not within his routine verbal reach.

Designing a Relevant MIS

We have said that ordinary Management Information Systems tend to give managers aggregated, precise, historical, internal information. "Total Information Systems" are built largely with the same kind of information (perhaps with some emphasis on trigger, as opposed to aggregated, information). These fit the POSDCORB image well. A manager who "plans" and "coordinates"—a manager who operates in a simple, structured environment—can use aggregated, precise, historical information. But, clearly, real managers do not work in this kind of environment. Their's is complex and unstructured. Thus, one must conclude that today's formal information systems are not designed for managers. They are designed by the specialists of the organization for the specialists of the organization.

The MIS serves those who perform the more routine, more programmed work, not the manager whose work is largely unprogrammed. The formal system deals with information for control and regulation (for example, production schedules, sales reports and standard costs) that is useful at middle and lower echelons. It excludes much of the intelligence information that high level managers need for their unprogrammed activities.

It is my belief that the central problem in MIS design is the verbal nature of the manager's information. As long as much of his information is non-documented and remains largely unknown and inaccessible to specialist and computer alike, it is folly to believe that the information specialist can design an effective MIS for the manager.

To build an MIS relevant for managers, the designer might begin by finding out what information a particular manager really needs by studying what he seeks, what he receives, and what he uses. The softer, non-quantitative information must not be excluded. Does the manager disseminate many new ideas into his organization? Does he spend much time touring to find problems? Does he attend many trade conferences? Are technical reports of great interest to him? Does he use periodicals to seek information on trends in the industry? What kinds of gossip do his informers bring him?

Next, the designer must undertake a comprehensive search for other sources of the same information. Can a better mix of periodicals be received? What other sources of technical reports exist? Can information from touring be gained in other ways? What are the different sources of trade gossip? The MIS designer can then piece together a carefully designed information system that not only covers more channels but also does much of the manager's scanning and filtering for him.

This is the first element in an effective MIS. The manager must be provided with relevant information in a way that economizes his time. No doubt, much of the information provided in such a system will concern external events and will emphasize the current, the specific, and the uncertain.

This information base must then provide the basis for a more systematic and more effective information disseminating system. A key char-

acteristic of the disseminating system is speed. One can perhaps visualize the organization of the future with teletype terminals in the offices of each senior executive. Then, true to the manager's information needs, the transmission of instant communication would be automated. The transmitter of information would simply choose which managers were to receive a current bit of news. He would then key in the code to open the proper channels, and would enter the message which would appear simultaneously in the appropriate offices. Perhaps, as in a newspaper office, the urgency of an item of "instant communication" coming in on the terminal would be signaled by the use of one, two, or three rings of a bell!

Role of the Computer and the Specialist

What role will the computer play in such an information system? The computer and the MIS are separate entities: one is a tool for processing large quantities of data that can be reduced to numerical form, the other is an organizational system providing relevant information for decision-making. Certain management information exists in numerical form and is properly stored and transmitted by a computer. But much is not. It may not be economical to pass gossip and other speculative information through a computer.

Today there is a tendency to design two distinct types of information systems—the formal system built into the computer and the informal system (as described earlier) which captures all other information. *We are in great need of an in-between system, a formal MIS which will systematically process the information that the computer cannot now handle but that the manager now needs.*

Such a system will consist of specialists who collect, process, and disseminate information to the manager. They will systematically seek out the gossip, the trends, the events, and the ideas, and they will report on them. Their key job will be to document much of the manager's information that hitherto existed only in verbal form. In effect, their basic role will be to break the manager's virtual monopoly on non-documented information. This is the information that drives the organization, yet the computer cannot receive it or handle it, the MIS designer has poor access to it, and the control system as presently conceived would be unable to make use of it.

In conclusion, it must be stressed that *the manager, not the computer, is now the real data bank of organizational information.* He is a walking, talking data bank, but not a writing one. Furthermore, the set of informal channels established by the manager, not the set of formal channels now set up by the MIS specialist, constitutes the real management information system.

Unfortunately, the manager is a potential obstruction in the flow of information. When he is busy, information may cease to flow. When he departs, he carries the data bank with him. And he is seriously constrained by the crude information system which he must design for himself. These difficulties will be overcome by studying the manager's information processing activities, and by trying to document his currently inaccessible information. Only then will relevant management information systems of a formal nature be built.

REFERENCES

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2. Richard E. Neustadt, *Presidental Power: The Politics of Leadership* (New York: The New American Library, 1964), p. 150.

3. Neustadt, *op. cit.,* p. 147.