New Data To Shape History

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HISTORIANS and archivists probably owe as great a debt to automation as does any sector of our complex society. Much of this debt is owed to new knowledge rising, phoenix style, from the ashes of our first automated data banks.

With the advent of the computer came great expectations. On all sides appeared prophets of the New Technology. The prophets told us that men of destiny, those great leaders and managers who shape our lives and the history we are living, will soon need only to stretch forth their fingers. With this decisive gesture they will press the proper buttons and summon all wisdom from an integrated-circuit oracle known as the computer. The rulings of the great men will then be instantaneous and unerring.

Those prophecies are proving to be near truths, not whole truths. The conscientious men who have labored to make the machines perform such miracles are finding great unanswered questions relating to the quest for "data to shape history." The discipline imposed by the unimaginative, untiring, but moronic machine forces the conscientious machine utilizer to pause and analyze.

But what *is* the nature of the data that shape history? Will these data be found really to be new?

In the sense that the data used for the purpose of making great decisions are being systematically gathered in recognizable form, they are new—at least superficially. In the sense that successful managers in the past have been able to arrive at approximations of these data by intuition or rough sampling, they are not new. Our ability to recognize such data, however, is the element that is new. That ability is only now emerging.

Even recognition of the need for a data base upon which to formulate decisions is relatively new. For example, Marshall E. Dimock, America's post-World War II philosopher on administration, stated flatly as late as the 1950's: "Every decision is partly conscious, partly unconscious; party logical, partly intuitive; partly

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calculating, partly based upon the fitting thing to do."[1] In fairness to Mr. Dimock, he does go on to explain some of the concepts of information technology, and he states that much can be done to systematize basic research so that more data can be used in the decision making process. But he was reacting as a prophet of the old order and had no faith in the new stirrings around him.

No such reluctance to put faith in the machine is found among the new breed of prophets, foremost among whom is young John Diebold. He speaks with the tone of certainty: "It is to the technology that we must turn to understand the business, economic, and social consequences of this new development, for it is in the technology that we find the seeds of tomorrow's world."[2] He goes on to give illustrations to prove his point and then turns directly to decision making: "A new breed of technologists . . . are studying business structures, situations, and behaviors in the firm conviction that the key to the very high levels of management decision-making is the understanding and ability to simulate the process of human thought itself."[3]

While the prophets are interesting, and even disturbing, a hard look at some of the new knowledge emerging from the ashes of the first automation structures is, perhaps, more profitable. For those who were privileged to attend the November Symposium on *Better Management Information and Reporting*,[4] the new points of view were most enlightening, especially from the standpoint of seeing time-honored beliefs shattered. The experiences revealed at the symposium were similar to those that the analysts of the National Archives and Records Service are having in their surveys. These are surveys in response to requests from Government agencies for help in improving information systems. Some of these experiences served as a basis for this paper.

What are information systems? What is their importance to archivists and historians?

At the heart of every information system found in organized government or industry is the necessary practice of delegation of authority. Delegation of authority has been recognized as a principle of management as far back in history as man has coped with organization. A good illustration was the advice that Moses

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[1] *A Philosophy of Administration*, p. 135 (New York, 1958).
[2] *Beyond Automation: Managerial Problems of an Exploding Technology*, p. 35 (New York, 1964).
[3] *Ibid.*, p. 42.
[4] Presented Nov. 1 and 2, 1966, in the Department of State Auditorium under the sponsorship of the National Archives and Records Service.

received from Jethro, his father-in-law, as recorded in the 18th chapter of Exodus, when he suggested that Moses delegate authority to the "rulers of thousands," "hundreds," etc., who would handle "every small matter."

Most administrators have been made aware of the pyramid concept, whereby responsibility and authority are delegated through successive layers from:[5]

> Top Management *to*
> Middle Management *to*
> Lower Management *to*
> Operative Employees.

Part and parcel of the delegation of authority is a responsibility to report data up through the pyramid. Previously this reporting requirement was conceived of as a type of summarization. According to the pyramid theory, lower management needed to know workload and production results and to be informed on difficult cases. Middle management needed to know trends and progress towards goals, within the limits of their interests. Top management needed to know broad trends and general progress towards goals.

This system in practice, however, tends to lead to a type of managerial blind-man's buff. Under it top management will find itself, of all segments, the blindest. Its data will at best be third or fourth hand *and* "screened."

David Brown in his recent article on the President's relation to Federal bureaus notes the superstructure that has been built, consisting of secretaries, assistant secretaries, and bureau chiefs. He labels this superstructure a "paper curtain . . . cutting off the President from direct contact."[6] Professor Brown would have done well to look also at the plight of bureau chiefs, who often are just as isolated from their program officers by the very same pyramidal relationship.

Wherein have the management theorists gone wrong? Why does the time-honored pyramid for reporting upward fail? Or rather, how does it usually fail?

Among the more important reasons for failures, two stand out clearly: the wrong type of information and little or no communication *back down* the pyramid—about the usefulness of information.

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[5] A good summary of the principle of delegation is found in Justin G. Longenecker, *Principles of Management and Organizational Behavior,* chapter 12 (Columbus, 1964).

[6] "The President and the Bureaus: Time for Renewal of Relationships?" in *Public Administration Review,* 26:175 (Sept. 1966).

Let us consider first the type of information that is needed. This consideration takes us back again to the delegation of authority.

In *theory,* the top management of an enterprise has examined the scope of the enterprise and has divided the universe of responsibilities into a number of parts. These parts, in total, are "delegated" to middle management. In *fact,* however, top management will always find that there are some responsibilities that cannot be delegated. To do so would be to abdicate. Among these responsibilities are coordination of the whole enterprise and guidance for growth and healthy change.

The same process and constraints are experienced when middle management delegates responsibility to lower management. There will remain some portion that is not delegated. Let us assume that a good organization has been established; competent and motivated staff have been assembled; and a conscientious effort has been made to achieve full delegation of responsibility and authority. What is left is always different in *nature,* not in *degree,* from that portion delegated. Like things are delegated. The residue that is left will contain the very essence of why that layer of management was created.

To provide information useful to the undelegated portions will require a different type of data from that which the typical summarization process of the pyramid would produce. The degree of difference increases as one ascends the pyramid. It is at this point that so many information systems fail. Their stacks of statistics, and even narrative reports, summarized upward from level to level (and incidentally "screened") are of some use, but they fall short of what is needed.

Management will develop new and sometimes peculiar sources of data to fill the unique needs. These sources will include "brain picking" of cronies, discussions at cocktail parties, special study teams, committee investigations, and any number of emergency measures. Some of the techniques add up in the end to little more than "hunch." Others result in enough real data so that they can be called, with many apologies, "scientific."

Very few of the vital decisions are made as a result of the flow upward through the reporting pyramid. That is probably one of the reasons why each level of management so often fails to communicate back down the pyramid, commenting on the usefulness of the data received. Reading the summary reports has proved a frustrating chore to the busy top executive—a chore occupying evenings that could have been spent in other ways.

One conclusion that can rightfully be drawn from an analysis of

the pyramid, the classically conceived reporting system, is that the pyramid provides very little record of the data that shape history. Too often the only record made is incidental doodles on note pads, cryptic marginal notations on memoranda and other documents used to communicate problems, or pale reflections in the document finally used to justify and explain a decision. The more important data that have really influenced decisions are the sole property of the few minds that shaped them. *Too often the data that brought about decision are as lost to history as those that influenced decision in the stone age. Also, as every top manager knows, too many decisions are made with too few data. In this regard, too many important enterprises are coming through on a wing and a prayer.*

Most of the authorities on executive development emphasize the need to make decisions. Even a bad decision is better than no decision, they say. With experience, decisions will come easier and easier. Jump in! The water is fine (if you do not drown)! With such a thin base upon which to make a decision, it is little wonder that most men hesitate.

Perhaps a brief glance at the anatomy of decision will help to clarify the types of data needed. Most observers conclude that there are two general types of decisions. Borrowing from military expressions, these are tactical and strategic.[7] Tactical decisions are related to specific, short-range problem solving. To a large degree, reporting of the old "pyramid" nature affords much (but not all) of the data needs for tactical decision. Strategic decisions, however, usually look beyond the daily, delegated experience. They are more dependent upon data (or "hunch") related to undelegated responsibilities. The "pyramid" helps, but usually it helps very little in making these more historic—or even "survival"—decisions.

In recent years authorities have agreed that decision making, regardless of general type, has five distinct phases. These phases are:[8]

> Defining the problem
> Analyzing the problem
> Developing alternate solutions
> Deciding upon the best solution
> Converting the decision into effective action

Of the five parts to decision making, the one that is the most difficult, and unquestionably most dependent upon good data, is the first: "defining the problem." Peter Drucker has made that point

[7] Peter F. Drucker, *The Practice of Management,* p. 351 ff. (New York, 1954).
[8] *Ibid.,* p. 353.

as clearly as any authority in the field. He writes: "The important and difficult job is to find the right question. For there are few things as useless—if not dangerous—as the right answer to the wrong question."[9]

Early symptoms of problems can be misleading. Most management analysts can recall instances when they have improved a process that should instead have been abandoned in favor of a completely different approach to achieving an end. Most top executives can remember organizational or policy decisions that, in the last analysis, failed to come to grips with the true problem. In both situations, the symptoms were misleading. *Right answers were found for the wrong questions.*

To a less degree, data, especially comparative data, are needed for the other phases of decision making. The key to successful management decision lies in good data.[10] That is why good management analysts begin all major studies with a broad reconnaissance. That is also the reason why successful executives drive themselves until late at night and through many "brain beating" sessions to garner a few "mustard seeds" of information.

Since decision making thirsts for data, especially data not ordinarily supplied by the classical pyramid concept, how then can such data be obtained? The answer lies within the total systems concept. Analysis begins with the client: exactly who is he and what are his needs? What are the true measures of progress? Which are the key indicators? These have been summarized as follows:[11]

Stated in its simplest form, the "total systems concept" has been characterized under the following five guidelines by the National Archives and Records Service:

1. *Substantive program needs should be analyzed first.*—The analysis includes: Identification of clients, objectives in relation to the clients, measures of progress, and development of simple but timely procedural steps.

2. *Key data for decision should be a natural output of systems.*—A few data on a consistent base, and which can be correlated in a number of ways, are the most useful.

3. *Relate accomplishment to people and people to reasonable objectives.*—Systems which keep people aware of their contributions to managerial goals and their part in the specific contributions are keystones to good management.

4. *Establish norms of cost and effort.*—Even the most sophisticated of professional activities can operate in a manner which relates to norms.

5. *Provide adequate service support and specialized technical assistance to*

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[9] *Ibid.*, p. 353.

[10] Drucker says: " 'Get the facts' is the first commandment." *Ibid.*, p. 358.

[11] Committee on Post Office and Civil Service, Subcommittee on Census and Statistics, *How To Cut Paperwork*, p. 11 (89 Cong., 2 sess., *H. Rept.* 2197; Washington, 1966).

substantive programs.—A great program officer is one who can use the supporting and specialized assistance available. A good organization is prepared to give the right support and right assistance at the right time. A thorough knowledge of the needs of the substantive program makes it possible to supply effective support.

Application of the technique for supplying decision data is in terms of the undelegated as well as the delegated portions of responsibility and authority. When one asks an industry president, department head, section chief, or first line supervisor, exactly who are *his* clients, what are *his* measures of progress, what are *his* key indicators, there come many surprises. By "asking," of course, is meant analyzing in depth. When one asks the same questions, and then does the necessary study to answer those questions for Government, beginning with the President and proceeding through Secretaries, bureau chiefs, service heads, and program officers, one is in for even more surprises. Oddly enough, the Secretary is not the projection of the President unless there is an adequate information system flowing in both directions. Neither are the bureau chiefs, service heads, or program officers projections from above unless they are brought into the system.

Unquestionably the lower echelons of management can serve their purposes better if they are contributing data to, and receiving feedback from, the undelegated positions of authority and responsibility. The lower echelons are in the best position to gather data, especially data that are work oriented or client oriented. These are within their grasp. Not all the information, of course, would come from the line echelons. Staff offices would contribute heavily, especially in the areas of comparative data and activities of related enterprises or other outside data.

It is too easy to overemphasize the role of staff offices in an information system. It should be remembered that staff authority and responsibility is delegated authority and responsibility. Management does not abdicate any more authority to the staff functions than it abdicates to the line functions. Everyone has seen how chart rooms, statistical analyses, budget evaluations, personnel evaluations, staff briefing sessions, and all the rest of the trappings of an information system can fail to contribute greatly to strategic decisions. Usually management will applaud these efforts warmly for the few "mustard seeds" of information they bring to the decision process. But managers, especially top managers, will all admit that in the lonely hour of decision they have had insufficient information. Also managers, especially top managers, will point to

numerous unfortunate occasions when they were caught by surprise by occurrences for which they were unprepared—although the data were available somewhere in their organization.

It is necessary to recognize that much information needed for decision is *not simply a summarization of lower echelon activity. Much of it is in fact different from that caught up in the summaries.*

One of the ways in which management observers have tried to pinpoint the different nature of much of the data that shape history is by using the concept of "management by exception." Lester R. Bittel has been a leader in developing this concept. He describes management by exception as: "A system of identification and communication that signals the manager when his attention is needed."[12] He does an excellent job of showing how key indicators can be established. As the definition becomes expanded, however, it becomes related to the undelegated portions of responsibility and authority. In many ways the term management by exception, delightfully simple though it appears, obscures more than it illuminates. The old reporting pyramid reacts to most exceptions (failure to meet goals, etc.) in normal operations. To provide the data to shape history, however, an aggressive, systematic means of searching for the right data is necessary.

Automation and the new data banks in the end will probably be the means by which most of the effective managerial data for decisions will be supplied. Since much of the information needed is of a "comparative," "factoring," and "sampling" variety, the slower and more ponderous manual techniques are not always responsive. No manager likes to hear the following testy excuse for not meeting a goal: "If I had spent the time on the job that this report to you is taking, I might be well along towards reaching my goal!" The machine at least will produce data without complaint, regardless of whether the data are only samplings or are only for the purpose of experimental probing. Properly conceived and engineered, the new data banks could give body to part of the system in places where substance is now lacking.

A word or two more on the new technology should be given before asking how archivists and historians might benefit from these new attitudes toward the decision making process.

Communication systems link all parts of our country. These systems are capable of carrying machine language (the binary codes of the computer) cheaply and expeditiously. These systems can accept data in one form (perhaps punched cards) and deliver them

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[12] *Management by Exception*, p. 5 (New York, 1964).

in another (perhaps magnetic tape). They can work through the night and over holidays, performing almost any task required of them. Remote linkage stations are now in routine operation, permitting a worker at a desk in one part of the county to dial directly into a computer nearby or in a distant State. Microfilm and other methods of memory storage are being developed with almost bewildering speed. These methods permit current data to be compared or linked with older, even retired data. We are now microfilming machine language. Drums and other buffering devices make it possible for many stations to use the same data bank. A dozen or more inquiries can be stacked on the spinning drum and then handled almost simultaneously. The computer is so fast that the persons making inquiry will scarcely notice any delays. Circuitry is highly flexible and efficient. Methods of response, ranging from spoken words (by the computer!) to television images, are in use.

The limitations are not technological, as all the modern observers, including John Diebold, point out. The limiting factor is human. We need to recognize the essential difference between data for strategic decision making and the more static, delegated-authority types of data. It will do little good to put our present pyramid reporting systems onto the computer. The first blows to free decision data so that they can be used must be struck by management analysts, not programers or electronic engineers.

Let us turn finally to the archivist and the historian.

If the manager will tend to benefit from a more orderly marshaling of decision data, so will the archivist and future historian. The records, as they are presently created, give very little hint of why great decisions were made. What hints they do give are usually misleading. On the surface it would seem that many of the decisions are well documented. Decisions are "justified" by reasons given after the fact. There are even (sometimes painfully apparent) bridges built between statistical data and decisions. This type of evidence becomes especially voluminous when a right answer has been given to a wrong question.

We are often left with the spectacle of capable, dedicated historians speculating as to why an important decision was made. Perhaps some speculation is inevitable; but, as better information systems are developed, we shall have better histories. We probably shall also have better decisions.