Research-Oriented Perspective on Information Management

BY DR. EILEEN TRAUTH

The technology that has emerged to facilitate the evolution {rom data 'processing into information processing calls for a *concomitment transformation in management perspective, from that of the management of information systems to one of information resource management (IRM). Not only the nature of the technology, but also its widespread dispersion throughout the organization, imply new considerations for planning and control. The corporations that will excel in the 1980's will be those that manage information* as a *meior resource.* [1]

• John Diebold, identifies the central issue of this new era of information processing. The task is that of shifting perspectives and management practices so as to be in harmony with the changes in the techniques and technologies of information processing.

Successful methods of information processing have been developed. What are now needed are compatible approaches to the management of these practices. If the change from data processing to information processing is more than mere terminology then management must also move from an input to an output-oriented approach. The convergence of technologies, once viewed as within the domain of -separate disciplines forces new outlooks on the . planning and control of systems based upon them.

Perhaps the "failure" of data processing and management information systems is not so much a failure as it Is a vertification of the evolutionary nature of information processing- methodologies. New information needs coupled with the available technologies of the 1980's enable migration into a new phase of information processing. The charge to management is first, to acknowledge this fact and second, to direct this technological potential according to organizational goals.

What is IRM?

The recent literature of systems management and information processing abounds with material on IRM. Certain common themes have emerged de-

spite the absence of a widely accepted definition of the term. In general, IRM can be seen as a response, a recognition, and a set of principles. It embodies a response to the current proliferation of information technologies. This growth has led to the implementation of new kinds of technologies not just in the traditional "computing" areas of data processing and MIS but throughout the organization: from the office to communications to manufacturing. Both the depth and breadth of use present management problems of coordination and control. Additionally, it represents a response to a "critical mass" level of information in the organization. As with any area of growth, the sheer amount of information needed and in use requires that it no longer be taken for granted or managed in an ad hoc fashion,"

Information Resource Management also represents an acknowledgment that something as pervasive as information and equipment as important as information technology should be considered at the highest levels in the organization. Recommendations for a Chief Information Officer (CIO) acknowledge this fact." Part of the recognition of information as a resource is the recognition that it has monetary value. Rather than an overhead activity, information processing and its product - information - have begun to have costs and benefits directly linked to it This activity, too, points to the need for a well defined management approach.' Also, like beauty, information lies in the domain of the recipient. This fact suggests that the orientation of information processing activity should be directed to the provision of information in the *form,* at the *time,* in the *place,* and to *whomever* wants/needs it.

Through recommendations about the implementation of IRM in an organization certain principles have been suggested. One is that the successful management of information derives from the successful management of the information resources. The information resources are comprised of the technical delivery systems (e.g., computers, telecommunications, word processing), the information sources, (e.g., the document, the transaction, the information flows), and the people (both the information professionals and the users) in the organization.

Another principle is shown in the shift in terminology from *data* processing to *information* management. The former suggests an input-orientation. The emphasis is on the raw materials - the data. The latter implies an output or results-orientation. The concern should be with the end product - information - wherever it originates or however it is produced. This change in orientation brings with it new opportunities for information processing and an expanded role for information management.

With the potential for information rather than data available in the organization comes and added benefit to management. Since data flows up through the organization it provides the basis for control. An emphasis on information, therefore, allows the complementary planning function which flows in the opposite direction to receive greater attention.

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But while IRM is seen by many as the answer to the information problems of today, it is seen by others as a new label for old ideas. This, indeed, could be the fate of IRM if not implemented properly, The charge that ft--- IRM is an ill-disguised attempt to provide a sinecure for aging data processing managers"5 could well be true for those managers who fail to expand their vision of the role of information processing in their organizations. The data processing manager should *not* be the information manager unless he/she is able to embrace the reality of data being processed in the office and on the assembly line as well as in the computer center.

It has been suggested that proponents of IRM are wasting their time considering the structure and characteristics of information and other such "esoterlca"," This is viewed as a misdirected emphasis on the information itself rather than on the information resources. It would seem that an integral part of the effective communication, processing and storage of, any information is an understanding of just such esoterica.

A final attack on IRM has been levied, ironically, by some of its proponents. IRM is *not* a "technological fix." Those who suggest that the solution to a corporation's information problems lies in the introduction of technology alone do a disservice to the concept. That the information manager should be a proactive change agent is true. That to be proactive necessarily implies "selling" automation is not.' To be proactive is to anticipate needs not to wear the blinders of hardware solutions. This is not to suggest that new information technology might not help solve a department's information problems. What is at issue here is a matter of perspective. To respond to a statement of need with a list of available technologies is to miss some of the scope that IRM embodies. A more appropriate response might be to ask: "What information is needed to serve those needs?" followed by: "How can this information best be provided?" Eventually, the issue of available technology comes about, but not until the focal point, the information, has been addressed.

IRM is Holistic

While the above considerations suggest the general domain of IRM, it is still somewhat elusive. The Paperwork Reduction Act (P.L. 96-511) offered the following definition:

> *The planning, budgeting, organizing, directing, training, promoting, controlling, and other managerial activities involved with the creation, collection, use, and dissemination of information.*[8]

Information Resource Management implies change. To see information as a vital resource in the organization suggests further recognitions. Information is then acknowledged to be the cohesive element that holds the organization together. In doing so, it cuts across departmental and divisional lines. As such, it should be managed wherever it exists and is used. To recognize information as a resource is to recognize the independent existence of information. It can then be seen as an entity separate from the techniques and technologies used to manipulate it. Information management need no longer be fragmentedby departments traditionally assigned to different aspects of information processing. Because of these changes in perspective new approaches to information processing and management can be entertained. Thus, IRM implies changes in the way -thlngs are currently done. Finally, IRM is holistic. It is not intended to be a new name for MIS. It does not look exclusively at technology for the solution to information problems. Information Resource Management does not lie in the domain of a single group of information professionals (be they librarians, programmers or analysts), but incorporates them all.

The changes in perspective brought about by IRM are due, in part, to the special characteristics of this resource. First, while other resources have a physical dimension, information does not. In order to accept this property of information, one must also accept that there is a difference between data and information. Data is the raw material from which information is created. It is the tangible manifestation of information. Information, on the other hand resides

within the individual. It is the product of intelligence. Thus, information is a human phenomenon. The final poperty of information also derives from its first property. Since information is intangible it is also not depleted through use. To the contrary, often, the most information one communicates, the more one ends up possessing.

While the properties of information have hot changed, what has changed is the degree of dependence upon information. Because of our rapidly changing world; decisions that an organization must make are more difficult. There is less likelihood today that a decision-setting will be similar to one that has already. occurred. Many more decisions that a company makes are first-time or one-time decisions. There is less likelihood, therefore; that existing information will satisfy future decision-making needs. Thus, the need for the right information is more important than ever.

Because of the growing dependence upon information in an organization, those who control it, quite naturally, are in a position of power. Increasingiy, the diagram of a company's information flows might be a better indication of the chain of real authority than the official organization chart.

Recognition of the differences between information and the other orqanizatlonal resources coupled with the recognition of its importance to an organization results in the need for new perspectives on the role of information. Traditional notions of information as a static commodity that is manipulated by machines gives way to newer attitudes about how information is and should be processed in an organization. An overriding implication is for the management of this activity.

Factors Influencing Change

These changes in perspective have been alluded to by observers of the field. Through analysis. of the "failure" of data processing and management information systems two conclusions can be drawn. The first is that traditionally, data processing has focused on the technology rather than on the information. This has led, for one thing, to the assumption of hardware solutions to information problems. This, in turn, has contributed to the fragmentation of effort and control where duplication abounds. Emphasizing the physical manifestation - the technology - rather than the content - the information - leads to more concern with the efficiency of data throughout than with the effectiveness of the information that results. One outcome is the proverbial information gap, the chasm between the data produced and the reality it is supposed to represent

The second point is that upper management's needs regarding information have not been adequately met. Their needs are different froin those of the operational levels. This fact, while it may seem somewhat obvious, has not been fully incorporated into existing approaches to information processing. The needs of strategic decision makers are for filtered, often external information that is helpful in making unstructured decisions. The information should be able to tell the corporation where it is going, in addition to where it has been," The information should be suited to the management style of the person who will be usinq it. Instead, these people have been given data suited for operational decisions that is the product of systems designed for limited areas of application." A fixation on existing forms of data (thinking "What else can we do with this data that we already have?") has led to responding to requests for more information by providing more of the *existing type* of information. IRM is then partially a conclusion that existing systems have not been designed to satisfy all of the user community.

Changes in the management of information technology are also being forced by a series of convergences. One is the convergence of technology. The literature is replete with discussions of the computer/communications interface. New terminology has also emerged. In the United States the term "compunicatlon" has been used to describe this phenomenon that abroad has been called. "lnfornatics"," The management aspects of this new technological area have been addressed at both the national and organizational levels. The most recent example is the deregtilation of AT&T. What this suggests is that policies' regarding either data processing or communications (whether voice or data) can no longer be established without taking the other into account. Satellite-based, digital-video-voice networks being developed give evidence of this fact,"

Another significant area of convergence is that of data/word processing. Despite the fact that data processing revolves around machines whose origins are computational and word processing has evolved from machines whose scope is textual, both currently depend upon computers. As software for traditional computers includes increasingly sophisticated text editors and as traditional typewriters get "smarter" any clear distinction between the two areas ,

of information processing fades. Given that this is the case, an information management schema must recognize both data processing and word processing as information activities within its scope.

The kinds of decisions being made and the role of information relative to them suggests that the information storage and retrieval function is becoming another area of convergence. Typically, the internal operational, financial, and personnel information is in the domain of the data processing department , while the external information of a research an environmental nature resides in the corporate library or information center. As external conditions continue to impact upon internal operations the motivation to coordinate if not integrate both data bases grows. But that much more needs to be done is exemplified in educational approaches toward the different information professionals. Students in computer science understand data bases to mean internal data bases while students of library science study data bases as they exist externally.

A final area of convergence is perhaps the most difficult to approach from a managerial perspective. This is the integration of informal and formal information. The need to manage the processing of formal information is a recognized fact. This has traditionally been the activity of data processing. But the burgeoning amount of paperwork and human communication has motivated the computer industry to enter the other area of information processing as well. Witness the growth of integrated office information systems. The significant management issue does not lie in the acquisition of appropriate technology. It derives from the second property of information mentioned earlier. Since information is a human phenomenon, successful management approaches will be those that pay adequate attention to the behavioral domain. While behavioral considerations are important to all areas of information processing management they are especially important when dealing with informal information. How will people feel about having their research-in-progress stored in a computer to which others might obtain access? Will people want their internal memoranda perpetrated throughout a company network? Isn't something of a human's uniqueness lost if every piece of inforrnation is reduced to bits and bytes? The answers to such questions must be given within the context of information as a vital organizational resource. A balance must be struck between the cohesive role of information and the recognition of the power that information wields.

Criticism of existing approaches to information processing can provide a vehicle for assessing the strengths and weaknesses of the field. But the failures and successes must also be put into the proper context. Automated data processing is a young discipline. It is reasonable to expect that as organizations learn more about managing their information new models will emerge. External developments in technology encourage this movement. Thus, the progression from calculating machines through data processing and management information systems to information resource management can be seen as a natural evolution. As organizations learn more about this entity - information - and as its role and importance become increasingly clear, new approaches are bound to be taken. This widespread shift from emphasis on data processing to concern with information management parallels Nolan's description of the stages of EDP growth within an organization.[13]

The Implications for Management

The implications of these changes for management are varied. They are both conceptual and concrete. Of primary importance is an understanding that implementation of IRM is not a technical issue. Gerald L. Matlin expressed it well when he stated that:

> An *approach that recognizes the social process involved in managing information will create an effective IRM program regardless of the varieties of equipment used within the company.*[14]

His comments provide the backdrop against which the tasks of the information manager can be considered.

The main objective of the information manager should be to make integrated use of information technology and activities. Despite the degree of centralization and control, great strides towards this integration can be made by fostering greater communication among the information professionals in the organization. They should be made to see that they are all working towards the same end - the provision of valuable information. As stated previously a fundamental recognition should be made that information is a vital corporate resource. Managing from this viewpoint requires a holistic outlook. It also requires that the behavioral dynamics be taken into account. When *all* types of information enter the domain of management, certain political and social factors must also be brought in. Management resis-

tance to new methods must be anticipated and planned for. The unintended consequences of these innovations should also be considered. Improved technology should not be pursued at the expense of inappropriate systems that would waste resources or create opportunities for abuse." Forest Horton has suggested certain policies that could be adopted. Among those are: 1) a policy on access to information involving protocols and privacy and confidentiality concerns; 2) a policy regarding accountability for information including the efficient and effective use of information; and 3) a policy that relates the management of technology to the management of information."

What kind of person is capable of accomplishing these tasks? The overwhelming conclusion appears to be one who is capable of seeing information problems as organizational problems. This is not to say that the Information Manager should not possess technical competence. Rather, it is to suggest that *hel* she be able to see the technology within the context of the overall business needs. As such, the Information Manager should function as a corporate planner. This person should be capable. of developing policies, coordinating groups, and managing both projects and personnel as they relate to information processlng." The abilityto look beyond specific technological answers also requires an interdisciplinary perspective. This provides the integrative feature that is essential to IRM. A disciplinary approach is reactive, Itwaits until an issue fits within the conceptual "slot" of a particular technology or a given department. In contrast, an interdisciplinary approach is anticipatory. It takes responsibility for the issue no matter what the technological implications.

In addition to competent information managers, the success of IRM depends upon its placement within the organization. Certainly the developmental level of information processing should be a significant factor. In some cases a new organizational function for IRM would be premature. Instead, the information manager could concentrate on a coordination and cooperative effort that might evolve into a well defined position. But for companies with mature computer systems and experience managing information, establishing a separate line entity might be appropriate." The following services could be included under the Vice President of Information Services: data processing, communications, records management (and corporate library), printing, the micro or information center and office systems.

Conclusion

The domain of information management is complex. It involves a reorientation of attitudes and outlooks. The focus shifts from maintaining technology that satisfies data requests to developing systems to provide real answers to information needs. New and convergent technology enhancesthis activity. But an interdisciplinary perspective sees the hardware in the proper context. Given an output-orientation, IRM's primary concern is with the effectiveness and the value of the information; the particular means of doing so is secondary. Because of the increased scope of information activities, political and SOCIal forces enter the arena. They must be taken into account when managing information as a vital resource. A successful management approach to information processing would be one based on a holistic perspective. This requires an outlook capable of integrating the diversity of information technologies and activities within an organization. In addition, the nature of the key elements in information processing (the people, the technology, and the information) must all be taken into account

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