

# **An Overview of Information Management and Information Managers**

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## **Abstract**

This paper introduces and defines the subject of Information Management and describes what Information Managers do, pointing out connections with related fields and professions. Key challenges for information managers are emphasized. A brief bibliography is included.

# **An Overview of Information Management and Information Managers**

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## **Purpose and Introduction**

This paper introduces and defines the emerging subject of Information Management (IM) and describes what Information Managers (IMgrs) do. Central ideas regarding IM have been gathered from several sources and are presented in summary form. This presentation is primarily normative, summarizing what authors and practitioners are saying IM should be, and what IMgrs should do. We will only briefly consider whether IM ideas are of value in practice, or how widely they are used. Readers should consult other sources for empirical studies or evaluations of IM. (Keyes, 1993; Marchand & Horton, 1986; McGee & Prusak, 1993) A brief bibliography is included at the end of the paper.

At its present stage of development, IM is not generally understood or fully accepted by managers or information professionals. (Bent & McLachlan, 1994; Martin, 1991; Touche-Ross, 1992) There is confusion about the term "Information Management", and how it may relate to established subjects such as Management Information Systems (MIS), Information Engineering (IE), or Library Administration. A major purpose of this paper is to clarify these relationships.

## **Defining "Information Management"**

*Information Resources* are generally of three types:

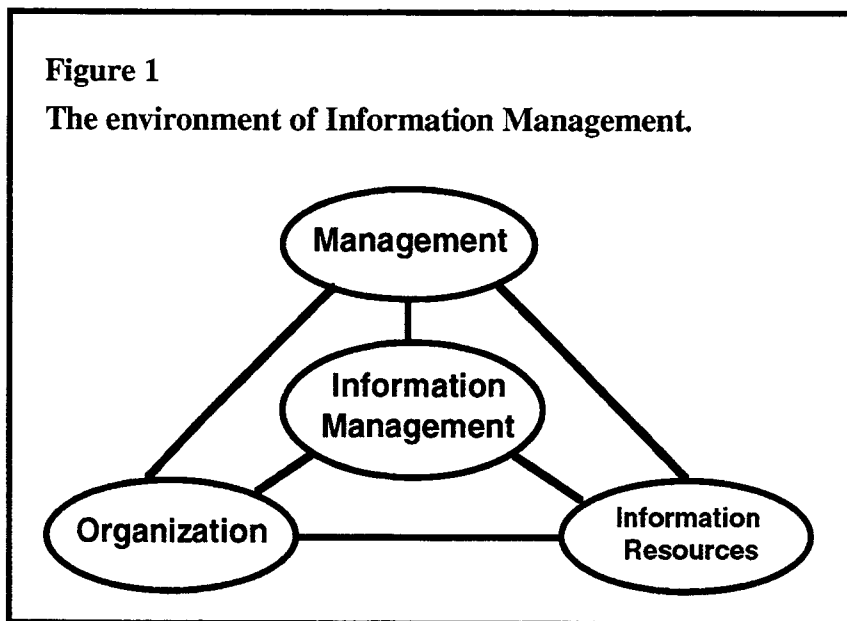
- (1) *carriers or sources of information*<sup>1</sup> regardless of medium (e.g., computer files, microforms, papers) or format (e.g., books, memos, printouts);

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<sup>1</sup> The three categories of information resources listed here have proven to be useful for practical purposes; their management typically involves different considerations. (Burk & Horton, 1988) A room full of filing cabinets, an information centre, and a computerized sales information system present quite different administrative possibilities.

- (2) *information services* are organizational entities such as libraries, information centres, or commercial information services which assist in the delivery of information to users, producing information in the required medium or format;
- (3) *information systems* are integrated configurations of computers, software, telecommunications or reprographics equipment, and personnel to store, process, and deliver information products. <sup>2</sup>

People are really the most important information resource of all. They are sources of information, are able to provide information services, and are an integral part of effective information systems. In the information resource categories above, people act as individuals and as members of the organizations providing information services; at the same time, they are clients of information systems, or viewed alternatively, participants in the IM *value chains*.



*Management* includes the classical roles of planning, organizing, coordinating, deciding, and controlling. In the context of IM, managers perform these actions upon information resources. Every manager handles information, but Information Managers (IMgrs) are specialists in the management of information resources.

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<sup>2</sup> We emphasize again that the categories are pragmatically motivated, and not mutually exclusive. Information systems store and transform information resources, which may be used by information services, etc..

They produce relevant information for their clients, in a timely fashion and for acceptable cost. Their clients may be external or internal to the organization.

*Information Management* is the management of information resources in order to meet the goals of organizations. The field is diverse and inclusive. Figure 1 suggests the environment in which IM is carried out. The IM process involves interventions by managers to deploy information resources for organizational purposes.

Information Management proceeds by

1. identifying important information needs of an organization;
2. identifying and assessing information resources;
3. developing or deploying the resources to meet the needs.

### **Principles or Values of Information Management**

Like other managerial subjects, IM is a recommended approach or collection of ideas (hopefully consistent ideas) which have proven to be beneficial in practice. The ideas of IM have evolved from related subjects and are presented here in summary form:

- Information resources may be considered central and critical to exploitation of all other resources. (Martin, 1988)

A characteristic of information is its pervasive or adaptable quality, and this quality is shared by the *carriers* of information, the various information resources. This is particularly the case with electronic information resources, where information can be easily transformed, combined, transmitted, re-formatted, and so forth. In order for information to be effectively managed, the integrated management of all resources should be considered.

- Information is independent of the means by which it is stored, manipulated, or delivered -- the various information resources.

IM considers *all* sources of information, regardless of format -- letters, books, memos, reports, manuals, financial statements, plans, maps, computer files, or drawings -- as well as audio, visual, computer, and multimedia materials. IM considers *both electronic and traditional means* of storing, manipulating, and delivering information, as appropriate.

- IM considers the mission, goals, and objectives of the organization to identify those *information needs which are most important*.
- IM seeks to manage information resources throughout their *life-cycle*: acquisition, deployment, use, and disposal.

A useful way of analyzing information processes is to trace the transformation of information resources throughout their life cycle. (Ricks, Swafford, & Gow, 1992) This approach is widely used in information systems analysis. A related concept is that of the *information value chain*: the values added to products by the application of information as the products are processed from raw material, through various stages of development, to final product. (Burk & Horton, 1988; Davenport, 1993) To determine the value of information, one could examine its contribution in the value chain.

### **Subjects Closely Related to Information Management**

There is not yet a general understanding of the IM approach, although the main concepts have been fairly well formulated for almost fifteen years. (Bent & McLachlan, 1994; Martin, Davies, & Titterington, 1991; Touche-Ross, 1992) Two reasons for the confusion are the similar labels for closely related subject areas and the use of different terminology in different fields and by different authors. It seems that sufficiently precise, yet generally understood terms have not yet been developed for IM. Many authors do not distinguish between Information Systems and Technology (IS&T) and IM. Because IM includes IS&T management, this is understandable.

A confusion between IM and related approaches is more than pedantic; it could have expensive effects. In many organizations, managers (particularly senior managers) are confusing IS&T with IM, believing that investments in IS&T will produce the information desired. (McGee and Prusak, 1993) In the absence of IM, production of the information that really counts may happen more by accident than by design. As another example, King has shown that the strategic planning factors relating to IS&T and IM are quite different. (King, Grover, & Hufnagel, 1989)

The following terms (acronyms in brackets) are either synonymous with IM, closely related to IM, or a facet of IM.

- Information Resources Management (IRM) is a term dating from the late 1970s which has the same meaning as IM;
- (Management) Information Systems (M)IS;
- (Electronic) Data Processing (E)DP;
- Data Administration;
- Information Technology (IT) Management;
- Information Engineering (IE);
- Process Re-engineering;
- Records Management (RM);
- Library Administration;
- Archival Administration.

Figure 2 may be helpful in conceptualizing some of the relationships among these subject areas. The labels can mislead and divide information professionals.<sup>3</sup>

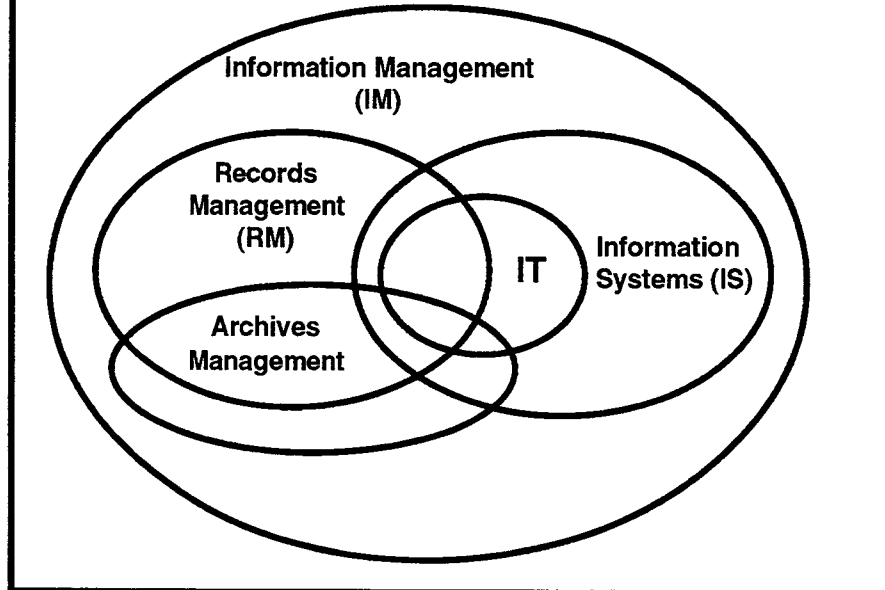
Lytle has stated:

"Too much ink has been spilled debating whether information resource management is something new or whether it is just another name for data processing management or management information systems. In fact, all of these borrow each other's ideas. That borrowing is a positive development as long as it leads in useful directions. There is an important progression from data processing management to MIS to IRM. And that is true even if "IRM" is practiced today by those who consider themselves to be in the MIS tradition." (Lytle, 1988)

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<sup>3</sup> The diagram is intended to show *logical* relationships and not the *relative importance* of these fields. One can adjust the size of the ovals to suit the sensitivities of various professional groups.

**Figure 2**  
**The logical relationship of some Information Management subjects.** (after Touche Ross, 1992)



Lytle is right; it seems to be high time for the information professions to acknowledge their common problems, pool their collective wisdom, and begin the common work of applying IM in their various organizations.

### **The Role of Senior Management in Information Management**

Clearly IM is a long-term undertaking which must be rationalized by anticipated long-term benefits. There are two ways in which senior managers can establish an IM program: by strategy or by policy. There has been much attention focused upon "strategic" information systems (Laudon & Laudon, 1993, Chapter 3), most recently in the use of information technology as a key enabler for "process re-engineering". (Davenport, 1993) IMgrs need to consider the strategic uses of information. (McGee & Prusak, 1993) However, because IM should be organization-wide and linked to policy-based functions such as records management or the corporate telecommunication infrastructure, a broad policy approach is also appropriate and can achieve important results. (Orna, 1990)

The manner in which IM is initiated can be critical to success: organizational resistance may follow announcement of a re-assessment of information processes.

There is evidence that good general managers may not make overt sweeping policy decisions but instead are skillful at exploiting opportunities. (Wrapp, 1984) Lytle makes the point that management should promote IM in ways that are consistent with the organization's corporate culture. (Lytle, 1988, 12)

Whether a series of strategic initiatives or policy development is used to implement IM, it is evident that the effective leadership of senior management is crucial. By virtue of their responsibilities and access to information, senior managers are often centrally involved in information processes; it also appears that an informational role is integral to the work of senior management. (Mintzberg, 1971)

### **Functions of Information Management**

An organization may seek to manage or coordinate any of the functions listed in Table 1 when setting up an IM policy or program. (Stibic, 1986) It is an interesting exercise for an information professional to consider in what way their organization carries out the various functions, and in what aspects of the spectrum of IM activities they have expertise, or need more resources.

**Table 1  
Functions of Information Management**

#### **Information-Related Activities in General Management**

- Setting the general goals and policies for information acquisition, processing, storage, distribution, and use within the organization;
- Organizing and coordinating operations in the field of information, including definition of duties of managers at various levels regarding informational activities, and choosing the degree of decentralization;
- Selecting and training of IM personnel;
- Developing critical success factors for IM (sometimes called "information success factors"); explicitly considering the strategic use of information;
- Selecting of appropriate resources for central or corporate management, perhaps to achieve strategic purposes;
- Coordination of information resource plans (e.g., IT plans, IS plans) with general corporate planning;
- Coordination of process re-engineering and quality management programs with information needs and processes.

#### **Management of Information Resources**

- Global inventory, budgeting, and evaluation of information resources;



### **Table 1 (continued)**

- Securing of information resources; backup procedures; disaster recovery;
- Management of libraries, archives, information centres;
- Coordination of decentralized information services;
- Analysis of user needs for information;
- Information engineering;
- Data administration;
- Information systems planning and development;
- Organization and management of in-house databases, and coordination of local databases;
- Records management;
- Micrographics services;
- Document handling systems, including forms design;
- Selection and acquisition of external information: databases and special services;
- Stimulation of the use of expert systems and other aids to leverage the value of information resources.

### **Management of Information Technology (Equipment, Software, Telecommunications Equipment)**

- Monitoring IT developments and relating to corporate goals;
- Management of centralized information resources:
  - computer centres;
  - voice and data communications;
  - internal communication networks;
  - external communication systems;
  - technical services -- installation, maintenance, repair;
  - computer and data information centres;
  - micrographics;
- Support for decentralized IT operations
  - office information systems
  - coordination of specialized and decentralized IT resources;
- Coordination of IT acquisitions;
- Adoption of standards, protocols, and overall architecture for the technical organization of information resources.

### **Management of other Communications Services**

- Reprographics;
- Direct control of central printing operations; coordination of printing and copying activities;
- Mail room and mail operations;
- Control of an in-house viewdata or current awareness services;
- Audio-visual or multimedia services;
- Management of the publication department;
- Coordination of publication activities in decentralized units.

## **Critical Success Factors for Information Management**

It is evident that the full implementation of the IM program is a challenging undertaking, engaging managers at all levels across the organization. Indeed, in most organizations, the vigorous implementation of IM ideas will challenge existing technical, organizational, and managerial arrangements. The following "critical success factors" for IM have been identified:

- The need to achieve strategic information planning: to identify what information resources, and which information processes, are crucial for organizational success;
- The need to integrate information handling methodologies into organizations in a practical, effective manner;
- The need to apply cost-benefit analysis or to otherwise rationalize the management of information resources.

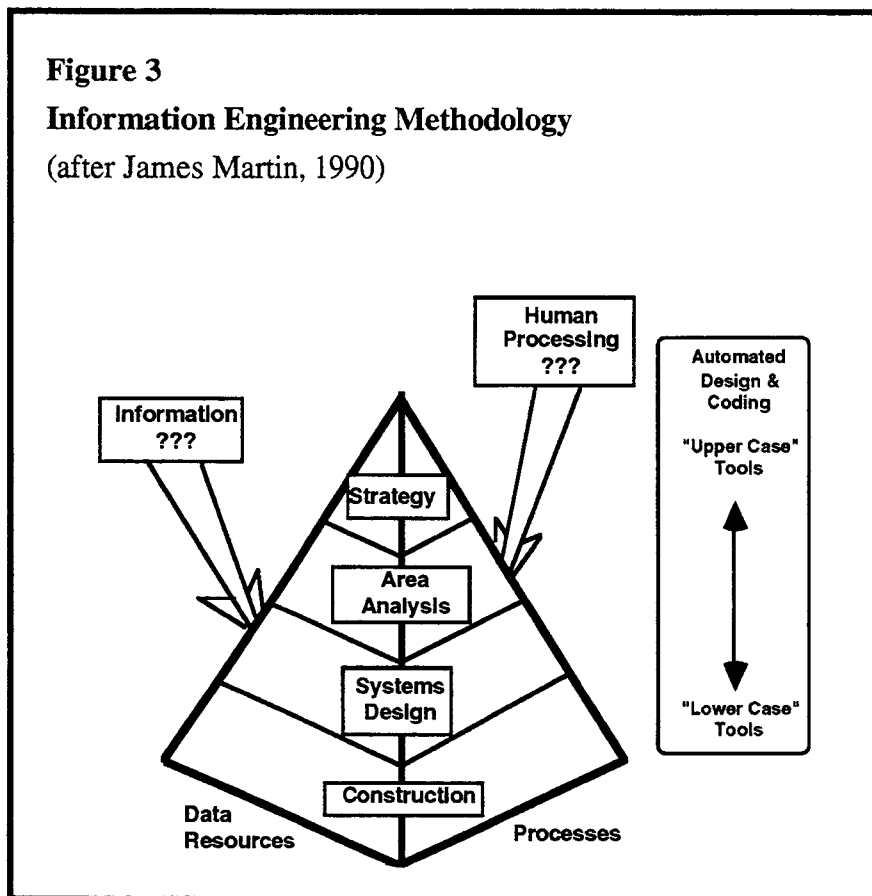
## **Information Engineering and Information Management**

Figure 3 is helpful in conceptualizing the approach of Information Engineering. (Martin, 1990) The pyramid represents the various levels of management; at each level different kinds of information processes are carried out. Information Engineering (IE) has the same general goals as IM; however, it is focused upon the automated and disciplined construction of information systems. As presented by most authors, the emphasis in IE is mostly upon technology and not upon information *per se*. The IM goal of providing the right information to the right person at the right time is *subsumed* in IE. IE may be viewed as a further development of MIS, which evolved from electronic data processing with its computer technology roots.

A topic considered to be part of Information Engineering is the development of CASE tools -- software tools for Computer-Assisted Software Engineering. The literature generally classifies these tools into "upper CASE" tools -- dealing with activities in the upper levels of the pyramid, and "lower CASE" tools -- dealing with the lower levels of the pyramid. The Holy Grail of software engineering is the development of integrated suites of automated tools for all levels of management, thus permitting the automated construction of information systems

in conformity with organizational purposes. (Holloway & Bidgood, 1993) IE may be viewed as Software Engineering with "strategic management" bolted on, or perhaps as a kind of systems engineering in the tradition of operations research and management science.

Information Engineering has recently reached a stage of development where it may be applied throughout the organization. Perhaps 10% of organizations are now using IE methodology. Because of its demanding technological basis, IE is primarily being carried out by information systems groups, often to the exclusion of other groups who have IM expertise. In practice, IE modeling is frequently focused upon data and information processes internal to the organization, and more specifically, data stored or storable within the corporate information systems, rather than the 80% - 90% of records in traditional formats (mostly paper files). (Ricks, et al., 1992; Touche-Ross, 1992)



The high profile of Information Engineering and other computer-based approaches to IM may impede the implementation of the IM agenda, because the demanding technological component may exclude or obscure the vital roles of other IM resources or the contribution of other professions (e.g., records management). There is a danger that external information, traditional information processes, or non-technological information specialists may be ignored or excluded.

Martin makes the following statement regarding the necessity for IE methods to build organization-wide information systems:

"Because an enterprise is so complex, planning, analysis, design, and construction [of computerized information systems] cannot be achieved on an enterprise-wide basis without automated tools." (Martin, 1990)

This seems correct, and if so, IM (which may include the development of computerized information systems) cannot be fully realized without IE methods. For most organizations, however, it would be premature to attempt a top-to-bottom IE approach, when basic questions of philosophy, information content, and organization have yet to be addressed.

The image in Figure 3 invites one to ask what may be hidden from view on the back of the pyramid. One can speculate that there are two hidden faces representing "information" (not data) and "human processing of information" (not technological functions). That would be satisfying, for the same image could then depict the overall IM methodology.

## **Titles for Information Management Professionals**

The information professionals listed in Table 2 perform work which is integral or closely related to IM work.

<b>Table 2 Information Professionals Involved in Information Management Work</b>	
Librarians and Library Consultants	
Archivists	
Information Systems and Technology Professionals	
Programmers, Systems Designers and Analysts	
Database Designers and Administrators	
Data Processing Managers	
MIS Managers	
Computer and Network Operations Managers	
Organization-Wide Systems Services	
Organization and Methods Analysts	
Records Managers	
Forms Designers	
Management Science and Operations Research Analysts	
General Managers and Management Consultants	
Information Officers	
Entrepreneurs	
Managers of Information Resource Companies	
Designers of Information Products	
Publishers	
Science and Technology-related Professionals	
Knowledge Engineers	
Information Industry Professionals	
Abstractors and Indexors	
Information Brokers	
Salespersons for Information Services	
Information Counselors	

## **What do Information Managers Do?**

There are now a number of college or university-level programs which are aimed at producing IMgrs. (Finke, Kuhlen, & Vogel, 1989; Laribee, 1992; Vogel, 1985) For purposes of formal training and development of information managers in organizations, it is desirable to have a clearer picture of what IMgrs might do. The ideal IMgr might combine the relevant skills of computer science, business administration, and library and information science graduates. (Bent & McLachlan, 1994) The following material has been adapted from Vogel:

- IMgrs are concerned with the assessment of the total information needs and uses of the organization within which they are working; in particular they seek to align information resources to support the mission, goals, and strategically important activities of the organization;
- IMgrs conduct inventories of information resources, describe, classify, and assess information resources; and prepare guides, manuals, indexes, or organize systems to access the information resources;
- IMgrs analyze information requirements, sources of information, and the flow of information (subject matter, media, routing), encourage information flows across the organization, and put suppliers of information in touch with those who need it.
- IMgrs identify information processes in need of improvement, such as long routes or delays, inefficient or ineffective systems, lack of training, lack of resources, and attempt to improve these.
- IMgrs provide advice regarding the presentation of information and the interfacing of information systems;
- IMgrs gather information about new technologies and information sources, external or internal, and evaluate their use for purposes of the organization;
- IMgrs participate in the planning or improvement of information systems, taking into account the specific organizational and financial

framework, the possibilities of technology, as well as the social and psychological conditions for information processing.

- IMgrs prepare proposals for acquisition, construction, or improvement of information resources and processes and present these to committees or executive bodies. IMgrs will generally participate in this planning and implementation work through membership on a project team in cooperation with other information specialists or managers.
- IMgrs maintain appropriate knowledge of the organization for which they work, and a general knowledge of similar organizations including their information management norms or practices.

The most senior information manager in an organization is sometimes called the CIO -- Chief Information Officer. It must be admitted, however, that many CIOs do not explicitly concern themselves with the *sine qua non* of IM -- the *information content* of information resources and processes.

### **Know-How Required by Information Managers:**

The following list of knowledge and skills needed by IMgrs has been adapted from several sources. (see Vogel, 1985)

- IMgrs should have competency in the methods of obtaining information (literature searches, use of retrieval systems, interviews, questionnaires, observation, experiments) and in analysis and design methods (problem analysis, organizational analysis, statistics, system analysis). IMgrs must also be competent in assessing information needs and behavioral patterns, and information sources, and in reorganizing information flows. IMgrs must possess a knowledge of how to introduce and evaluate information systems.
- IMgrs should have knowledge of internal and external information systems and sources, their content, structure, market, means of access, costs, techniques of data content analysis, and presentation.
- IMgrs should have a knowledge of information technology (computers, telecommunications, software, hardware, databases,

networks) and information systems design. A basic knowledge of IS&T is needed to communicate effectively with systems analysts and programmers, and to be able to visualize the possibilities for IS&T.

- IMgrs need a working knowledge of the functional areas of business or administration (finance and accounting, human resources, operations, marketing and sales, policy), the terminology of management, and the more important management concepts and techniques.

### **Attaining the Goals of Information Management**

Levitan stated the goals of IM as follows:<sup>4</sup>

- "(1) ensuring that only relevant (not all) information flows into corporate decisions;
- (2) making sure that costs of getting and managing information are compared with projected benefits;
- (3) changing people's attitudes so that information becomes viewed as a major asset in the organization;
- (4) analyzing information requirements before acquiring information technologies instead of the reverse;
- (5) legitimizing the role of the IMgr so he or she can challenge other managers on their IM practices;
- (6) establishment of training so other managers can implement the IM program;
- (7) making users responsible for their information activities by including them in system designs and [information-related] decisions, charging them for services, and making them accountable for resources they need to produce information;
- (8) identification of in-house and outside opportunities for improving applications of information resources to organizational decisions and problems;
- (9) fixing accountability for use and husbandry of information resources on designated people in the organization;
- (10) making consideration of organizational information needs routine in all aspects of the enterprise." (Levitan, 1982)

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<sup>4</sup> Levitan actually compiled the goals listed as those of IRM: Information Resource Management. Many authors have been moving toward the use of the term "Information Management" as a substitute for IRM.



King has challenged this view of IM as follows:

"This describes a person<sup>5</sup> with exceptional skills in administration, budgeting, information theory, technical systems, planning, policy making, human relations, and operational knowledge of the organization's functions; such people are likely to be hard to find. Moreover, any manager with this mandate would face formidable obstacles in overcoming the inertia of established organizational practice, not to mention the obstreperous actions of other top-level administrators attempting to contain the extraordinary power implied in the job description of the IM executive." (King & Kraemer, 1988)

It is obvious in view of the foregoing that no manager would or should acquire exclusive responsibility for all IM functions, any more than the Comptroller of an organization has total control of all financial resources. (Horton, 1992) In practice, most IM is performed by teams containing persons with various IM skills. (Bent & McLachlan, 1994; Davenport, 1993) However, the "information content" on such teams is usually supplied by "user representatives": persons experienced in the operational area in which IM is being developed. Such persons may be unable to challenge the value of traditional information or processes. The skills of the IMgr are needed to correct a bias toward the *status quo*.

### **Conclusions**

Whether IM flourishes as a coherent set of management techniques, and whether IMgrs develop as a recognized class of professionals, is yet to be determined. It seems clear that the ideas of IM have received general acceptance (Khoury, 1989; Touche-Ross, 1992); however, the practical application of those concepts has yet to be widely realized. Re-statement of the IM ideas continues to be important in order to incorporate current developments, and to encourage the many different information professionals to reach outside of their traditional domains to contribute to IM. Indeed, the creative participation of all information professions is needed to successfully realize the IM program.

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<sup>5</sup> King was probably thinking of the role of that omnipotent executive, the Chief Information Officer.

## Selected Bibliography

Burk & Horton and Marchand & Horton provide a comprehensive introduction and overview of the philosophy and methods of IM. (Burk & Horton, 1988; Marchand & Horton, 1986) Martin has provided a non-technical and readable exposition of the methods of Information Engineering. (Martin, 1990) A summary and critique of IM has been provided by Lytle. (Lytle, 1988) Touche Ross Management Consultants has gathered information about the state of IM in the UK. (Touche-Ross, 1992) Davenport has presented a summary of Process Re-Engineering emphasizing the role of information resources. (Davenport, 1993) McGee and Prusak have emphasized the vital role of information in organizational strategy. (McGee & Prusak, 1993)

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