

INFORMATION MANAGEMENT: AN INVESTMENT FOR THE FUTURE

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We are all witnesses to the current information explosion that affects every aspect of our lives. Some of us may wonder if this explosion can be contained and controlled.

Computer technology has nurtured the evolution of devices that perform data storage and manipulation functions at reasonable cost. Government, industry and commerce have rapidly made use of such devices in an effort to improve information systems for decision-making processes. The better the quality and timeliness of information, the more powerful and competitive the user can become.

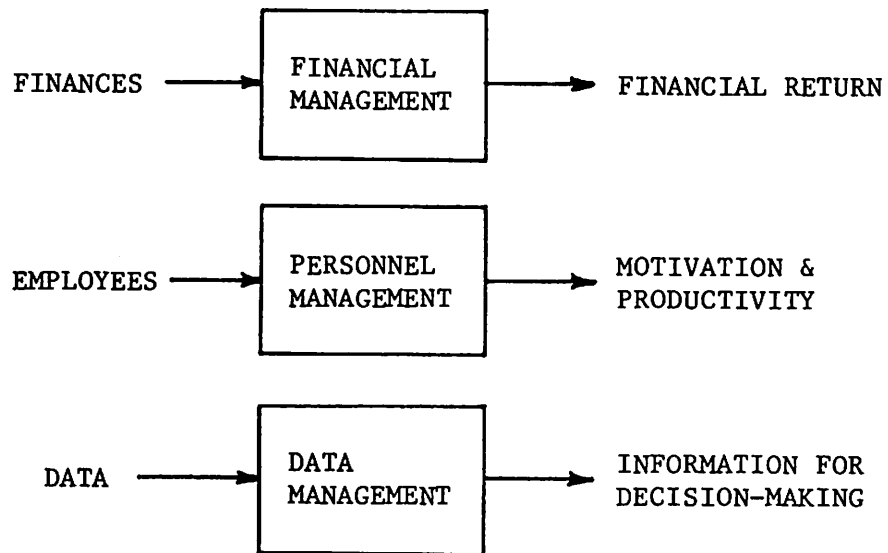
Unfortunately, the technologies that support the effective utilization of information systems have trailed the dramatic advances in computer hardware and software. There is still not a general awareness that data is an organizational resource that requires management control, administration and involvement. The first illustration draws an analogy to other resource management areas in that good data management will directly benefit information systems needed for decision-making. Data management is, however, a far less developed area than either financial or personnel management. Very few organizations that have attempted to establish a corporate data base resource have been completely successful. The history of integrated management information systems contains many failures, and indeed, the downfall of several organizations.

Like many technological advances, those related to information handling are full of promise, yet also hide many dangers. Failures can generally be attributed to two major causes: the incomplete and incorrect application of the technologies and resulting information handling facilities; and the lack of necessary changes to organizational structure to complement the integrated information structure.

It is relatively easy for senior executives to decide upon a data resource management strategy, but it is a far different matter to understand all of the different components necessary for strategy success. These problems are compounded by the fact that there are very few professionals in this area with adequate levels of experience.

The second illustration highlights the resistance that corporate management typically meets in the introduction of data base technology. Re-

RESOURCE MANAGEMENT



INTRODUCING DATA BASE TECHNOLOGY TO AN ORGANIZATION

RESISTANCE TO:

- CHANGE IN METHODS AND PROCEDURES
- LOSS OF DATA OWNERSHIP
- LOSS OF DATA CONTROL
- CHANGE IN THE POWER STRUCTURE
- CHANGE IN THE STATUS OF DP USERS
- CHANGE IN STAFF REQUIREMENTS

CORPORATE OPPORTUNITIES:

- IMPROVED METHODS AND PROCEDURES
- CORPORATE DATA MANAGEMENT
- CORPORATE CONTROL STANDARDS
- PROFESSIONAL DATA MANAGEMENT
- IMPROVED DATA UTILIZATION
- REDUCED COST AND ABILITY TO CONTROL

sistance can occur in both data processing and user departments as the need for new responsibilities and procedures becomes evident. Few executives are equipped with all of the correct rebuttals to the criticisms that result from the resistance. So intense can the resistance become that often the data base approach is introduced in a compromised manner and one that is far from beneficial to the organization.

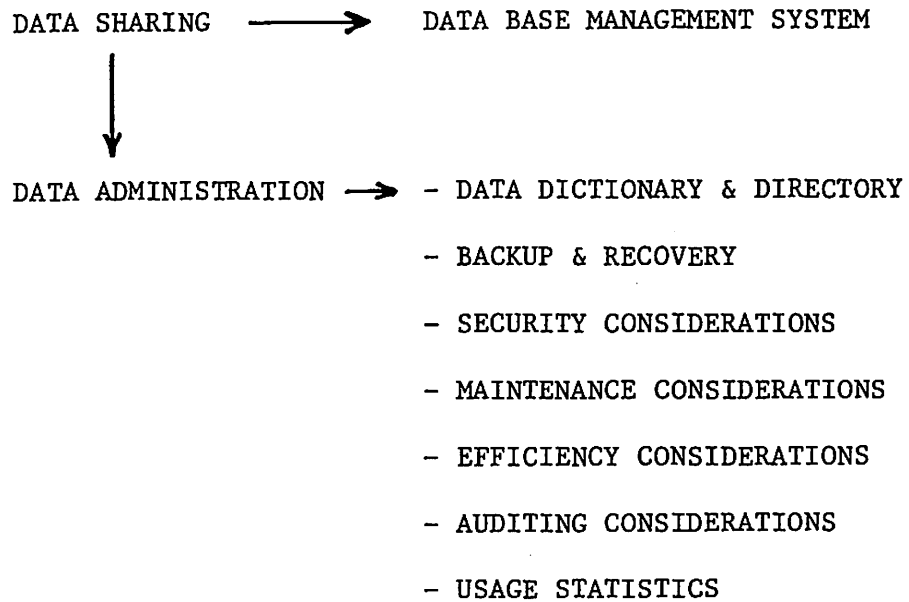
Corporate opportunities that can be realized by the data base approach are immeasurable and there is an ever increasing responsibility on the data processing profession to ensure that the approach is fully understood and supported. The second illustration also enumerates the respective benefits that can accrue to the organization, but, in order to achieve these benefits, the organization must be willing to invest the necessary developmental resources into the data base approach.

Once the data base approach has been adopted as a means to achieve data resource management, it is important to realize that a data sharing concept has been introduced within the organization. That is, the common data in the corporate data base is to be shared by all those in the organization that have a right and need to access the data. The major technical facility that supports data sharing is a data base management system (dbms). A dbms is often presented as the solution to the problem of data sharing, but, in reality, it is just one of the facilities needed to achieve data sharing in a resource management environment. Crucial to the success of data sharing is data administration, sometimes referred to as data base administration. Data administration encompasses the other facilities, procedures and tools needed to manage the data base. The third illustration shows the major aspects of data administration. The degree to which an organization addresses and implements facilities in these areas depends on the complexity, integration and value of the data together with limitations imposed by the budget available for data management.

First and foremost of the required administration facilities is a data dictionary and directory (DD&D). The DD&D is essentially an information system about the data and data processing systems used in the organization. To the person or persons responsible for data administration, it represents a tool to document and control the data base facility. If the data base driven information systems are an integral part of the operations of the organization, then the data base will normally have to be flexible and changeable, to reflect and support business dynamics. The DD&D should be designed and organized to provide for this type of environment.

For some organizations, the DD&D will evolve into the hub, or nerve-center, of their data processing facilities. It will control, monitor and service the corporate data base together with the associated information systems.

DATA SHARING REQUIREMENTS



There are other data administration facilities which complement the DD&D, many of which are still in the evolutionary stage. These facilities are aimed at such considerations as ensuring that the corporate data base is always organized in the most efficient manner, and is normally available, and is recoverable in the event of system failures.

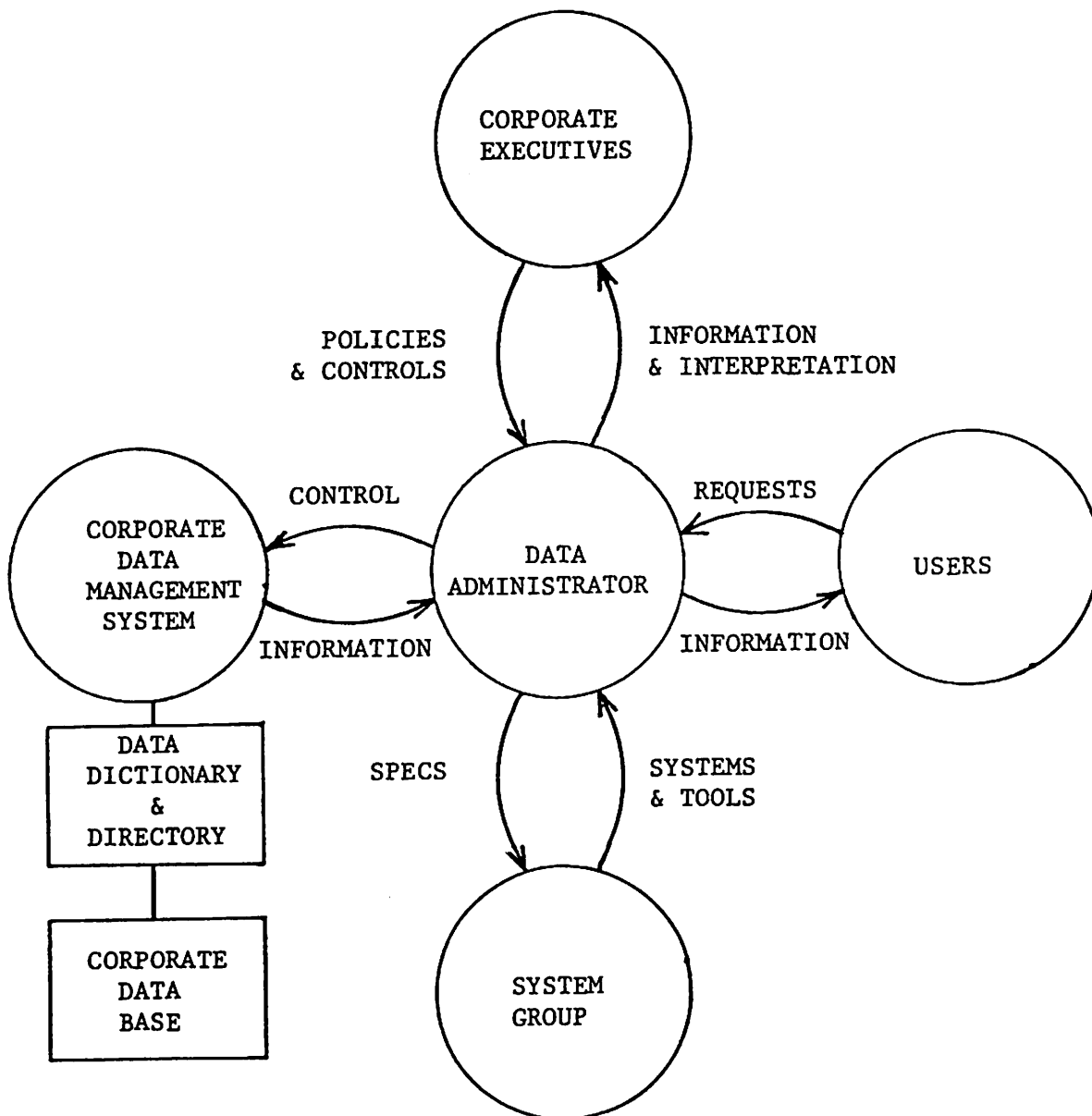
Another important aspect of information systems concerns auditability and performance measurement. These are typically topics that are considered only at system implementation, but a data administration function can ensure that system audit becomes a design parameter during analysis and development.

The fourth illustration shows the responsibilities of the person (Data Administrator) or persons performing the data administration function. Like other resource managers, the Data Administrator (DA) must be placed in an organizational structure such that he or she can coordinate and be held responsible for all of the technical and administrative components needed to effect data sharing. The DA is responsible to the corporate executives to inform them of requirements and situations which demand their participation and decision-making; and then to enact and administer the resulting policies and data control measures. The DA is responsible to data processing users in the response to queries and requests and in the provision of facilities that make data more accessible to those with the right to access it. The DA interfaces with the systems group in order to obtain the hardware and software which is required to provide and support the data base and processing environment for which he or she is responsible. The final interface within the organization is to the corporate data management system which embodies all of the facilities needed to provide control and administration of the corporate data base.

With a perception of the data administration requirements, the specification of a suitable DD&D can be detailed. The fifth illustration lists the major components of a DD&D. Again, the complexity and contents of the DD&D should match the requirements and budget of the organization. The components cover the documentation of how data is perceived in the organization (documents, forms, used by department, etc.); how data is structured in the data base designs; and how data is used in the data processing systems. Supporting these directories are dictionary and directory entries which document data items and their attributes, data validation rules, data security measures and data item synonyms and associates.

The sixth illustration depicts the role of the DD&D in an organization. It is the method by which the DA documents, controls and administers the corporate data base and information systems. It is a source of information and a design capture device for data base and information system designers. It is a source of information and a change capture

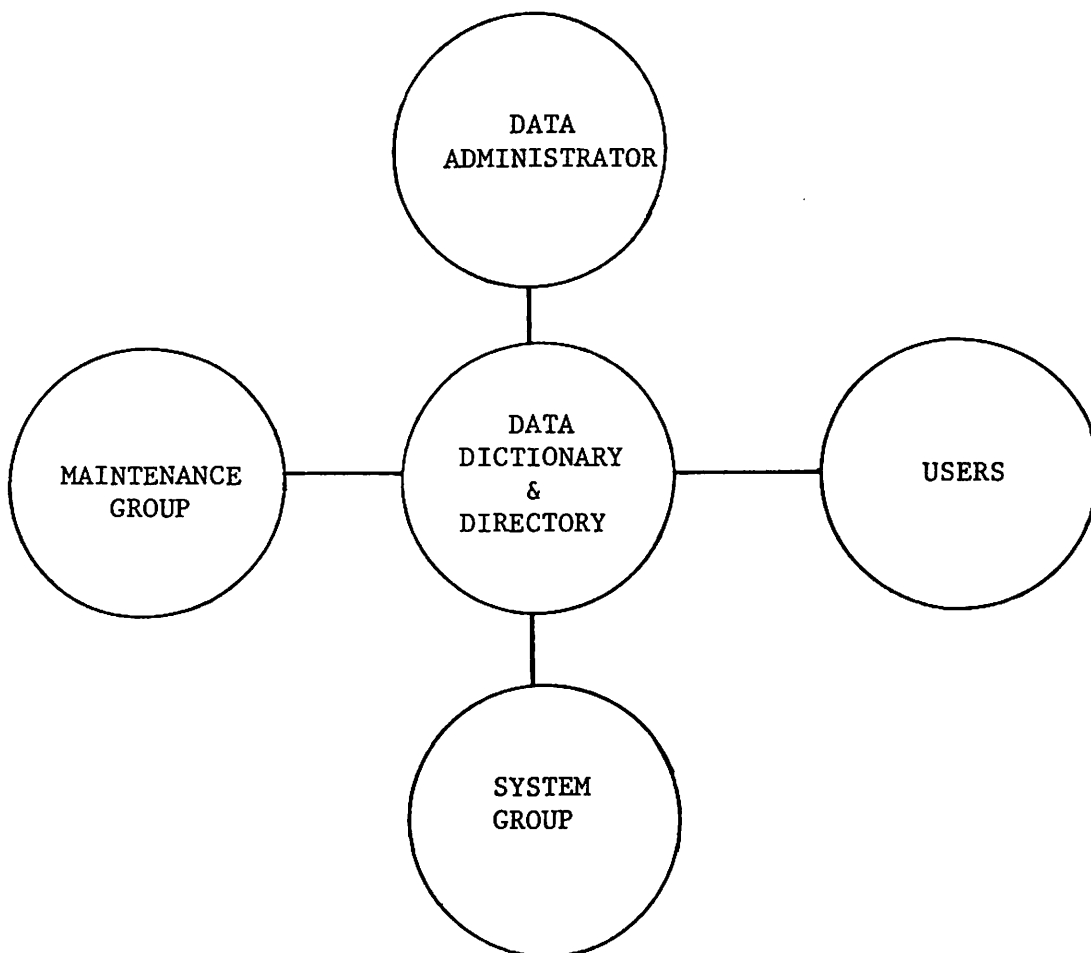
ROLE OF THE DATA ADMINISTRATOR



DATA DICTIONARY & DIRECTORY CONTENTS

- DICTIONARY & DIRECTORY OF THE NATURAL DATA ITEMS
AND DATA ITEM GROUPINGS IN AN ORGANIZATION
- DICTIONARY & DIRECTORY OF THE DATA STRUCTURES
DESIGNED FOR THE CORPORATE DATA BASE(S)
- DICTIONARY OF DATA ITEM ATTRIBUTES
- DICTIONARY OF DATA ITEM VALIDATION RULES
- DIRECTORY OF DATA ITEM SECURITY MEASURES
- DIRECTORY OF DATA ITEM SYNONYMS AND ASSOCIATES
- DIRECTORY & CROSS-REFERENCE OF DATA ITEMS TO
PROGRAMS AND TO DOCUMENTS

ROLE OF THE DATA DICTIONARY & DIRECTORY



device for the maintenance group, as existing data bases and information systems are modified and enhanced. It is a source of information to users who can discover what data is available without the need to contact the DA or associated staff. This is particularly true in the case of an online DD&D which can support information queries from the users.

One data administration topic that is currently receiving a lot of attention concerns data security. The seventh illustration contains a list of items needing protection consideration and a list of events that can constitute a threat to the data and system security. The first list identifies that security measures applied to data files and data bases are of little value if security measures are not applied to: the computer memory and storage devices during data processing; the hard copy data listings and reports distributed in the organization; the data transmission lines where remote terminals, workstations or satellite computers are involved; and the security measures themselves. In a similar manner to security provided by lock and key, data base and processing security is only a deterrent and each extra level of security will typically involve exponential increases in the cost and time of the security measure implementation and practice. These extra measures of security protection should be applied only where sensitivity of the information involved warrants it.

The second list covers the major threats to the security and availability of data. These are important considerations in a data sharing environment since the data has been organized in a logically or physically central location and it is collectively more vulnerable to security violation. One of the most important tasks for the DA in an organization is to achieve the correct balance between data accessibility and privacy.

The challenge that faces most organizations at this time is the effective creation of a data sharing environment. It requires an investment in terms of people, funds and organizational change; but the future benefits of a well managed data resource to aid and make possible decision-making are immeasurable.

The presentation of the paper will enlarge upon these topics and suggest various methods of evaluating and implementing data administration facilities and procedures.

DATA SECURITY

WHAT TO PROTECT?

- DATA ITEMS AND DATA FILES
- COMPUTER MEMORY AND DATA STORAGE DEVICES
- DATA LISTINGS AND INFORMATION REPORTS
- DATA TRANSMISSION
- SECURITY SYSTEM(S) AND PROCEDURE(S)

PROTECT FROM WHAT?

- HUMAN AND SYSTEM ERRORS
- ENVIRONMENTAL ACCIDENTS OR CATASTROPHES
- MISCHIEVIOUSNESS AND FRAUDULENCE
- INDUSTRIAL AND POLITICAL ESPIONAGE