ADMINISTERING DEPARTMENTAL DATABASES
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ABSTRACT

Coping with the expanding demands for information placed upon an organization is becoming more and more difficult. Individual units within organizations often feel these demands more keenly than others. The mainframe systems run by organizations are often overburdened and backlogged with requests, and thus are unable to respond quickly to such demands. Creating and maintaining a departmental database utilizing current technology can be an appropriate solution to such problems, but require careful design and implementation.

INTRODUCTION

Individually and as organizations, we are becoming more aware of the technical and data resources available to us. This awareness has created a demand for extended computing power and data resources; a demand often beyond the capability of the Information Systems group to fulfill. As a result, many individuals and departments have begun purchasing and utilizing their own micro based systems. The growth of these small systems has been so explosive that some experts, such as Henderson et al. [2] say that "The creative use of computers by non-data processing experts, namely "end-users," is one of the most significant developments of the last decade."

This development in the growth of end-user computing has come about for a variety of reasons. The personal computer can be used to automate many tasks, and it can make one's job easier. But the primary reason for the growth in end user computing has been a growing need for data.

Departments of both private and public sector organizations are often faced with demands for data from multiple requesting agencies: state and federal governments, clients, vendors, and other departments of the organization. This data may or may not be available on an organization's main system.

Many departments currently keep this data in file drawers, on card systems, or in an unorganized state. As the capabilities of computer based systems become more evident, managers find that the data can instead be maintained on a departmental database that tracks the data for which the department is responsible. As Davenport [1] indicates "...improving productivity and reducing costs remain prime reasons for implementing any new system. At the same time, timely management information is increasingly important in our highly complex, interdependent world characterized by the rapid pace of change. And so we began to use our technology to gather pertinent information from inside and outside the company for timely analysis"

Obviously there are other means than a departmental database by which this data could be collected, analyzed and delivered. Davenport [1] lists five channels for the delivery of information services:

1. Traditional centralized methods: Large, on-line, interactive, database systems that operate under the direction of the IS professionals in the glass house;
2. Decentralized methods: User operated, stand alone minicomputers which non-IS professionals often operate easily by themselves

3. Distributed Methods; Where the non-IS professional end-user sits at a terminal and taps into a computer that acts as an intermediary between the terminal and other larger hosts.

4. Information Centers; An IS service dedicated to giving end-users the tools, training, and support required to access, analyze and generate the tailored information they need from databases.

5. Microcomputers; Desk top microprocessors that incorporate aspects of all the above delivery channels, such as their versatility. In a way the personal computer is a kind of chameleon that can take on different colorations, depending on the processing environment or method used.

All of these alternative have their place, but many departments have found reason to choose the fifth alternative. Smaller databases have in the past been developed on all of these different channels, often at a difficult-to-justify cost levels. With the current capabilities being demonstrated by the newest generation of microcomputers, it is no longer necessary to purchase this expensive a system. Many departmental databases can now be implemented on microcomputers or microcomputers within a local area network.

CREATING A DEPARTMENTAL DATABASE

There can be many reasons for the development of a departmental database. One of the problems is mentioned above; the central system is overloaded and unable to meet all the requests of organizational users. This is not uncommon these days as the volume of requests for data seems to grow daily. Often organizations will make a specific determination that the growth of the central system is not warranted for the application being contemplated.

Increasing the power of a mainframe system is quite expensive in terms of hardware, software, and personnel. Many organizations are determining that some of their applications can be developed on stand-alone or net-worked systems. Deloitte Haskins and Sells in Australia recently began replacing their mainframe and mini applications with a continent wide system of inter-linked microcomputer local area network systems [3]. The new system gives the firm the ability to deliver very flexible systems to all of its field offices. The systems are capable of handling all of the needs of the users. Plus there is the added advantage of being able to add processing power when needed at relatively small incremental cost.

The need for a departmental database will be determined by the data needs of that department. There is often a need to input and access data not maintained on the mainframe. If only the originating department needs to maintain and access that data, it may not be economically feasible to put it on the mainframe.

By putting the data on a microcomputer based database system, the department can assert control of its own data. If the mainframe is overburdened and significantly behind on projects, the microcomputer system can make that data available in a shorter period of development time. The system, because it is controlled by the department, also can be more responsive to the ad hoc demands of the organization.

ASKING FOR DATA

Initially you may feel that you can acquire most of the data you want to utilize from your own department. The
Quillard et al. findings [3] indicate that over 80 percent of the data used by end users is hand entered. Moreover, since early applications tend to address specific problems of the end user data accessibility problems are minimal at first. You will probably come to a point, however, where you want to acquire some data from the mainframe. If so, there are some points to consider:

Once you have determined that you are going proceed to develop a departmental database, you will need to work with your central data-processing organization or MIS to acquire shared data. This will also require some forethought.

When you contact the MIS department there will be several issues to discuss. Often departmental managers are reluctant to contact the MIS staff. Frequently, this attitude is unwarranted. Most MIS departments are now very attuned to giving attention to the needs of users. Granted, they are often cautious about how things are done, but willing to help.

You should prepare to answer certain types of questions that the MIS group is almost certain to ask:

1. What kind of data do you need? What size, what format, and how frequently does it change? You should have this information in hand before you approach the MIS department;

2. How compatible is the mainframe data with the applications you want to run on the personal computers? The simpler it is for MIS to get the data to you, the easier it will be to acquire data;

3. How many users will need to access the mainframe, and how often? The answer will determine whether you need terminal emulation equipment, dedicated mainframe lines or less expensive personal computer modems and communications software;

4. Who’s responsible? Clear up in advance who will be responsible for both the system and the data. Will your department purchase and service the equipment; who will enter and extract data from the system.

**TAKING RESPONSIBILITY**

It is important to carefully decide who will be responsible for the departmental data. Client information, for example, which is used by multiple departments in the organization, should clearly be the purview of the central data system. Specific information about those clients, such as when their next appointment is, or how they performed on a specific test, would be kept only by the department.

The issue of responsibility is a crucial one. Once it is decided who is responsible for a specific type of data, then it is their responsibility to maintain it. They should be responsible for entering the data, checking to see it is correct, preparing reports using the data, and deleting or changing the data when necessary.

In addition, procedures should be set up to make sure that the integrity of data shared among departments is maintained. Once responsibility for a specific type of information is assigned, then only that group should have the right to enter, change or delete it. In our example of a set of client data, the MIS group would have the responsibility for maintaining the name, address, and phone number of the client. Other departments would not be allowed to enter or modify that data. The only way that they could suggest changes to this core data would be through uploads which where checked prior to entry by the MIS group. Information on appointments and tests, on the other hand, would be maintained by the local department. The MIS group would not have the authority to modify or enter this type of data, although they may have the authority to collect this type
of data from departments in order to maintain a central pool of information on appointments and tests.

EQUIPMENT

Most of the database systems written for use in a sophisticated microcomputer environment are IBM compatible. In order to acquire a system which is sufficiently powerful for other than trivial databases, you should plan on purchasing equipment which has more powerful microprocessors such as the 80286 (AT type) or the 80386. You should also purchase high capacity hard disks with capacities in excess of 50 megabytes, as well as a high speed printer.

Given today's prices this means that you can expect to spend in excess of $7000 for a single user system and in excess of $30,000 for a local area network system which supports three users. At those prices it is still a bargain.

CHARACTERISTICS OF EFFECTIVE LOCAL AREA NETWORKS

1. Cost: Consider both initial cost; lower with twisted pair system initially. Coaxial is more expensive but is generally more reliable for transferring data at high speeds. Coaxial also has a lower chance for electrical interference from stray radio signals.

2. System fault tolerance is another feature which increases the cost of system software, but is being demanded by purchasers. Fault tolerant systems keep the system running and the data secure even if some of the equipment fails. Such systems might include uninterpretable power supplies along with backup tape systems.

3. Another consideration is the inclusion of electronic mail. Electronic mail allows each user of the system to send and receive messages, even entire documents. Since it has the potential to interact with all users of the system it must be as user friendly as possible.

4. Finally, you need to consider how the system functions as a whole. Is it easy to use, are the commands integrated into a meaningful whole? Having the system demonstrated is essential.

DATABASE JOB FUNCTIONS

Downsizing to a smaller system does not mean that you can ignore the need for careful control of the system. There are several functions that need to be performed no matter what the system:

1. Database Administration - Maintenance of data integrity, control of the data dictionary, implementation and design of new data elements and data files;

2. Access Control - Control of physical access to system, control of security levels, control of data access;

3. Back up and Recovery Control - Control of regular backup of system, maintenance of backup programs and systems;

4. Transaction Control - Control of input and output of system, maintenance of error log, working with users to assess needs from current system and meet those needs;

5. Development Control - Working with users, database administration and others to assess future development needs of the system, maintain control over current design and development.

CONCLUSION

A departmental database can be a potent asset for a manager, if it is carefully designed and well managed. It is not, however an asset which can be put into place simply by purchasing a simple microcomputer or microcomputer network. It is a resource into
which a manager must put a lot of care and planning.

If the system is not well managed it will become more odious that the old paper system it grew out of. It will demand more resources - particularly personnel and money - than it is worth, and it will not give the manager the data it has hidden away in memory.

On the other hand, if care is taken to implement some of the suggestions given above, the resource will more than pay for itself.

BIBLIOGRAPHY


