July 7, 1986

TO: Members of the Ad Hoc Committee on MACC Mission Statement

From: Don McIsaac

Re: Campus Organization of Technical Matters

ABSTRACT

Academic computing on the Madison Campus is undergoing a significant change. Smaller, less costly computers provide greater opportunities for distributed computing. As a result, the nature of computing demand on the central facility has, and will continue to shift to a smaller set of highly specialized computing services. The need for and opportunities for administrative data processing, academic computing, library service, and telecommunications are sufficiently similar that they should be administratively reorganized to effectively coordinate the evolving campus information and computing needs.

INTRODUCTION

The purpose of this communication is to draw attention to two problems associated with the development of the new mission statement for MACC. As we have all carefully noted, computing activities are becoming increasingly distributed. Smaller computers cost less, deliver more, and require a different set of services than in the past. These technological advances make it possible to place significant computing power on an individual desk. Consequently much of the computing once performed on the central computer is now accomplished on distributed computers. A large portion of the money once spent on centralized machines is now required for the distributed units. However, distributed computing brings with it an increased need for communication between machines, and networks with specialized computing services.

As the shift in the locus of computing takes place there is a concurrent shift in the way computing decision are made.

At one time the nature of administrative computing was clearly distinguished from academic computing. As the two computing styles become increasingly similar, it may be necessary to rethink how we are organized to make computing decisions.

As the locus of computing decisions shift budgetary considerations must also be made. Different methods of delivering computing may require alternative funding considerations. Following is a discussion of problems associated with this phenomenon.

PROBLEM

As campus units make increased use of distributed computing facilities, two major problems emerge. Funding and financial resources are a perennial difficulty exacerbated by the shift of academic computing away from a central source. The second problem involves the increased number of computer users and the need to coordinate their computing interests and needs. There are four
major functions on the campus that have or will significantly change due to the influence of technology. Thus there are four major services on the campus in need of coordination. These include:

1. Administrative Data Processing (ADP)
2. Academic Computing (MACC)
3. Library Services
4. Telecommunications

As we close on a mission statement for academic computing, it is clear that the above major services each play a major role in the emerging information services effort. Academic computing is changing with shifts to smaller, less costly, distributed computers providing increasing proportions of the required effort. To be maximally effective, these machines will be networked for access to a wide array of services. These will include unique computing services in addition to important research services such as library information, super computers, file server, specialized print server or the like.

DISCUSSION

Administrative computing is traditionally associated with highly scheduled, controlled, and centralized activities. The data are collected under one jurisdiction, there exists carefully derived dictionaries of data element meanings and programmers tend to be organized within a single department. Academic computing has traditionally been decentralized, scheduled by individual users, and widely distributed with regard to fiscal responsibility and control.

Administrators are behaving more like researchers with regard to the data they have available. Powerful administrative modeling tools may be used to assess the consequences of alternative decisions. Many of these tools operate effectively on desktop machines. Consequently administrative offices request data they can examine privately and in systems over which they have control and the function is becoming increasingly decentralized. Alternatively, since the distributed aspects of academic computing are moving to smaller processors located in departments and staff offices, the more centralized functions remain to the central facility. Traditionally academic computing has not been centrally funded and the MACC activities for the common good have been supported out of annual income. With little increase in centralized computing accompanied by loss of the distributed income our academic computing needs will suffer a serious deficit. Without a shift in the method of support, the centralized needs of academic computing will greatly suffer. Changes in the technology will continue to bring about decentralization of both academic and administrative computing. Decentralization of academic computing subtracts from the central support, while decentralization of academic computing tends to supplement the central academic computing budget.

The availability of decision and research information brings about a need for data communications. Electronic communications becomes a critical. Telecommunications is, indeed, the glue that provides for the effective utilization of a wide variety of resources. It puts the Supercomputer in the hands of the campus researcher who models physical phenomena. It connects the researchers of the nation in ways that enable collaborative research like never before. Libraries continue to play their important role as the storehouse of information and data for research. Libraries play an important part in the distribution of information through electronic media. Search techniques coupled with data communications places a much more powerful library directly in the hands of the distributed user.

Without excessively belaboring the point, one can make several strong arguments for the changing and merging roles of academic computing, administrative data processing, library access, and effective electronic communications.

On the Madison campus, these four
functions report to and serve totally different areas. Administrative Data Processing is responsible to the Vice Chancellor for Administration. Academic Computing reports to the Vice Chancellor for Academic Affairs. The budget and financial considerations, however, tie Academic Computing closely to the Graduate School. Library Services reports to the Vice Chancellor for Academic Affairs. Telecommunications reports to the Office of Business Services.

The efforts of these various offices are coordinated through the Office of Information Technology. This office serves a staff function and provides advice regarding technical and information service matters. So far the advice has been pretty good and the outcomes reasonably effective. However, we do have an administrative network for data communication, a developing academic network and an emerging telecommunications network. Given a more comprehensive structure for making decisions in this area, we would probably have conceived a more cohesive solution.

Because personnel in the Office of Information serve as staff, it is extremely difficult to accommodate the shifting budgetary and decision needs of the campus. The pressures associated with the changes in the technology will only increase. The effective organizational structures of the past will not be as effective in the future. In the past, economies of scale were achieved through large computing machines and organizations to support those machines. The new economies of scale will be derived through communications and access to the wide variety of services available through the network. The services of the large computer of the past will be replaced by local computing with access to services available through a network.

**RECOMMENDATION**

It is probably beyond the scope of this committee to recommend a specific solution to the problem of coordinating the important decisions that must be made in the area of computing. However, in view of the mission that we foresee, we should recommend a solution that minimizes the competition for resources and service. Anything that brings the functions of academic computing, administrative data processing, library services, and telecommunications closer together for planning and operation will be a benefit to the campus. The range of solutions might include:

1. **Do nothing with organizational considerations.** Rely on the influence of the Office of Information Technology to bring sweet reason to the decisions that have to be made.

2. **Reorganize academic and administrative computing into one organization thus consolidating many of the emerging duplicate services.**

3. **Provide for the merge of library service and academic computing into an academic information services center.**

4. **Merge the four major information services functions into the Office of Information Technology.**

There are a large number of possible solutions. The purpose of this document is not to recommend a specific answer, but rather to signal the significance of the problem and the need for additional consideration. It will be very difficult for any academic computing mission to succeed without attention to the organizational considerations which influence the decisions, competitions and compromises yet to be made.