

A New Role for User Services

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IN THE PAST, user services groups have effectively served the small and homogeneous university communities involved in computing. Currently, however, the movement on university campuses is toward decentralized computing because of networking, the widespread use of microcomputers, and the entry of nontraditional users into computing. Because of this decentralization, user services groups will have to view their role in a new light. The direction our user services group has chosen to take is to change from a service organization to a research and development group. In order to make this change effectively, we will have to examine the areas of tailoring the computer environment, supporting software, documenting, educating the user, consulting, and developing software.

Our User Services group of 12 full-time and 12 part-time employees spent the past two and a half years installing and stabilizing an IBM-compatible AS/9000N. Concurrently we moved our academic research users to this machine from an overworked Honeywell 66/60 that had previously served both academic and administrative users on the University of Houston (UH)-University Park, the main campus of four campuses that comprise the university system. Initially, this move required that we familiarize our users with two new operating systems, the Conversational Monitor System (CMS) and Multiple Virtual System (MVS), although we have recently removed MVS from the system. At the same time, we continued to maintain a consistent level of support for a VAX 11/780 that served mostly undergraduate students. During this time we focused primarily on making our computing resources satisfy the varied needs of all our campus computer users. Time was a crucial factor since classes had to continue in as smooth a fashion as possible. In the rush of conversion, standards were not formulated or enforced, although the resulting computing environment, based on the AS/9000N and a Digital Equipment Corporation VAX 11/780, was fairly manageable.

Now, under the guidance of Dr. Richard Van Horn, our new chancellor who is an avid computer advocate, we have begun to build a computing environment that is considerably more complex. In June, 1984, the University of Houston announced plans to create one of the largest and most advanced computer intensive educational environments in the nation. Through this project, both administrative and academic computing tasks will take place at personal computing workstations. The university, with grants of up to \$35 million from Digital Equipment Corporation, plans to use up to 4,500 Digital Professional 350 and Rainbow 100 personal computers and a number of VAX 11/780's throughout its four campuses during the first two-year phase of the project. Ethernet local area networks on the four campuses will interconnect the workstations by means of a high speed microwave channel capable of transmitting over one million characters per second. The network will be designed to support up to 20,000 personal computers. The computer intensive environment

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will also include other microcomputers of various brands, a SYTEK network, DECNET, BITNET, and EDUNET.

This rapid expansion of computing made us realize that the role User Services at University Park has played in the past will not meet our users' needs in the future. Previously, we could consult with individual users, teach basic courses, produce specialized documents and modify the system to eliminate sporadic user problems. We focused mainly on providing service for the diverse user groups on campus. Now we plan to move toward making our users as independent and self-sufficient as possible, thus leaving us to play a greater role in development and a much smaller role in service. Part of our new role will be to divide our campus users into user groups that have common needs file and guide the user groups rather than the individual users. We plan to set standards for software and hardware development that will insure efficient and easy use of the systems. To do so, we will have to provide a consistent computing environment across all our systems.

In order to provide this kind of consistency, we will have to see software support in a new light. Currently, software support involves many different activities, including acting upon requests for new software. In order to provide efficient software support, it is essential to know users' needs and to guide users to the software that will satisfy their needs. When departments or faculty members need a software package, they request it from the Computing Center. Depending on the package—whether a version exists under our operating system, whether we have similar software already on the system—we order it. After we have acquired the software, we must install it on our system. An essential part of the installation is the creation of genuinely useful help files to be updated with new versions of the software. After the software is installed, we test it continuously to make certain that it is working properly, update it, and make appropriate modifications to meet our site's standards. We plan to develop and maintain consistency in standards and software use and streamline access wherever possible.

In the future, we are planning to take a more active role in supporting the software on our system. We are currently developing a standardized procedure and set of policies for software installations. We also intend to restructure our organization so that one person is the software coordinator for the group. This person will have responsibility for researching software currently available on the market and keeping the rest of the staff informed. We plan to store information about software on a database where it is easily accessible to everyone on our staff. Such accessibility will enable our user services staff to work more actively with departments on campus to determine their software needs and meet those needs quickly. Besides meeting immediate needs as they arise, staff members will be able to help plan for future departmental software needs. In planning for these needs, we will assess the allocation of system resources and the efficiency of the software package compared to other products on the market.

Two large components of software support are documentation and user education. Three years ago, when the AS/9000N was installed, we found ourselves documenting as a reaction to sudden user demands and unexpected computing problems. Because the new system was unfamiliar to Computing Center personnel and users alike, and because the campus computing needs were so diverse, we established our documentation priorities according to immediate user requirements. Our instructors needed materials to help their students learn to use the new machine; our researchers needed conversion documentation. Each department had special applications for familiar software that suddenly worked a little differently because of the change in operating systems.

Once the fires were put out, we turned our attention to formulating a documentation plan. This plan had to be structured enough to provide us with a measure for evaluating existing documents and a guide for writing future documents, yet flexible enough to allow for the growth of User Services, the campus user base, and computing in general. Our first step was to determine our goal. We decided that it was to devise a workable documentation plan to

1. effectively serve our diverse user group
2. allow us to use our human resources efficiently
3. allow for easy adjustment to future changes

The plan we formulated was based upon groupings of users by level of expertise, as suggested by a model developed at Iowa State University.¹ After looking closely at our user community, we defined the following groups:

1. Beginner level
Is inexperienced and unfamiliar with the computer; unsure of what it can do; needs elementary concepts, basic training in computer literacy; includes nontraditional users
2. Introductory level
Has had some introduction to computers; needs extensive basic training, especially on UH systems
3. Intermediate level
Has had general experience with the computer, probably via programming or editing; is experienced to the point of having confidence; will try to find answers to questions before asking for assistance; needs additional training in an area and sometimes more advanced general training
4. Specialized level
Has had much general experience with the computer, probably in a few areas such as batch processing or text editing; needs to learn a new software package
5. Experienced level
Is very experienced; possesses a great deal of knowledge about computing and software packages; needs more detailed technical information in a particular area²

Having categorized our users' levels of expertise, we then determined what types of information each level would need (See Appendix A.) We determined to make our users independent workers by providing the lower levels with CAI and tutorial documentation and the upper levels with reference documentation and special seminars. We also decided to write documentation in modularized units that we could easily modify to use at different levels for documentation and educational materials.

At this point, we have begun to revise existing documentation to conform to our plan. When we removed MVS from the AS/9000N, we produced lower level tutorials for former MVS users who would need to learn CMS. We also produced CMS reference documents for intermediate users who would be learning to use CMS. In addition, we identified numerous subjects for which we would need to write advanced documents. The latest development in documentation is our plan to write documents for our rapidly growing group of microcomputer users on campus. The first documents in this category explain KERMIT, a micro-mainframe file transfer program.

By providing our users with a means of getting information on their own, we plan to reduce the consulting load and free technical consultants for developmental tasks. In addition, documentation personnel will shift the emphasis from writing single documents to helping departments develop their own documentation and researching the market for existing documentation.

Like documentation, user education initially covered introductory information about accessing the different systems—again, an attempt to put out fires. In the rush to offer these courses, we had no direction. Once we had time to evaluate our courses, we found it necessary to formulate a plan for education that would be consistent with both our documentation plan and our plans for changing the role of our User Services group from consulting to research and development. To do this we would have to do three tasks:

1. formulate a user education plan that would decrease the amount of time consultants spend disseminating basic information (either through teaching short courses or consulting)
2. evaluate existing materials in light of the new plan

¹William C. Flick and Philip H. Isensee, "Organizing User Information: A Way to Hold Fewer Hands", ACM-SIGUCCS Eleventh User Services Conference Proceedings. (New York: The Association for Computing Machinery, Inc., 1983), pp. 113-122.

²Deborra A. Bowman, "Documenting for a Diverse University Audience", "Writing Documentation for the Computer Industry", a conference at Plymouth College in Plymouth, New Hampshire, 1984.

3. begin developing new materials

We wanted our short courses to serve the different levels of users defined by the documentation plan and to lend themselves to varied teaching methods and materials. Because we needed time to test and perfect materials, we decided to develop our introductory and intermediate short courses through several phases so that they would eventually be transformed into Computer Assisted Instruction (CAI). The phases of development are listed in the following chart: attain functional computer literacy on our campuses.

Phases of Short Course Development

Material Style	Teaching Method
Draft prose	lecture
Revised prose	lecture
Draft tutorial	lecture with hands-on workshop
Tutorial	workshop
Tutorial	CAI

In accordance with the documentation plan, our ultimate goal is to offer most introductory courses in a self-paced, on-line format accessible to all users. This development will free our small staff from teaching introductory courses so that they can concentrate on advanced consulting problems and software development. With more free time, they will also be able to work more closely with academic departments in designing advanced level workshops specific to their needs.

After formulating our plan, we then reviewed current courses. Upon evaluating existing short course materials, we found that their function was not geared towards the introductory audience for which they were intended. Most of the materials were informational rather than instructional; in other words, they were fine for users familiar with computers, but left the novice in the cold. It was obvious that we would need to make the introductory courses more instructional and increase the amount and depth of the intermediate and advanced materials.

Our first step towards implementation was to decide which courses were most important to offer, taking into account our goal of easing the consulting load. To take the burden of answering elementary questions from our technical specialists, we decided that introductory courses on each of our systems were the most important to offer. This list included the following courses:

System	Courses
VAX 11/780	Introductory Editing
	Intermediate Editing
	Running Programs
AS/9000N	Introductory Full Screen Editing
	Intermediate Full Screen Editing
	Introductory Line Mode Editing
	Intermediate Line Mode Editing
	Running Programs

Since our existing materials were not instructional, our next step was to develop course outlines that would give information in an instructional way. In writing our outlines, we kept in mind that introductory users want to know the 'hows' more than the 'whys'. Therefore, we approached topics from the standpoint of function rather than subject matter.

We will use these outlines to develop new course materials in draft prose style. We will test them at this phase, then progressively move them through the other phases listed in the previous chart.

The changes in user education and documentation should allow us to drastically change the way in which

we do consulting. This change is necessary if we are to retain a meaningful role in supporting academic users. Currently, we support consulting for faculty and graduate students at our main site Technical Consulting Office which is open forty hours a week and is staffed by technical specialists who consult on a one-to-one bases. Many of these consulting sessions result in follow-up work which can be extremely time consuming. Technical specialists are also responsible for administrating a central site Student Consulting Service which is open twenty-three hours a week and staffed by student consultants.

In the future, we will have to decentralize consulting. In the process, we will alter the type of consulting services we offer and, perhaps more importantly, change the role our technical specialists play. In the future, our technical specialists will teach key people in the colleges and departments on campus how to consult with their own users. Then, users will be able to seek help from newly trained consultants in their own disciplines, and these consultants will be more likely to provide meaningful support because they will share a common background with the users they serve. These consultants will turn to User Services' technical specialists only for problems they cannot solve. Departmental consultants will become experts and, as such, will deal only with the most technical problems. No longer will the technical specialists have to spend several hours each week helping users with a fairly low level of expertise. Furthermore, the technical specialists will be free to spend their time increasing their expertise and planning for new developments.

Previously, our User Services group developed very little of our own software. Thus, we had to rely on acquired software. This reliance was due to frequent staff turnovers and little time to train new employees. To further complicate matters, our staff was involved in a large number of software installations and in the writing of local procedures to run this software.

Now we are looking forward to dynamic growth and change. Our organization, like our computing systems, is more stable so we are able to plan for changes in services, equipment and technology. This type of environment fosters the development of good local software because we have the time to assess needs and the ability to schedule software development.

We have begun to start developing software in three major areas: making the Conversational Monitor System (CMS) consistent, enabling users to access specialized hardware devices, and tailoring text processing to users' special needs.

We first planned to eliminate the inconsistencies and instabilities the university computing community began to experience at various levels of usage. Many of these inconsistencies are inherent in the operating system itself. For example wildcards are not used the same way in all commands, and many times very different procedures are used to perform very similar tasks. To deal with these problems, users need an extensive set of documentation to use the system effectively. These inconsistencies and instabilities are further complicated by our documentation and outside vendor software. In addition, error messages are not tied in with the error reporting system of CMS itself. Because of these problems, we saw ourselves leading users by the hand through the process of learning the system.

A committee of personnel from our User Services group was established to study the CMS system, explore the inconsistencies, and recommend ways to deal with them. This committee developed a proposal for a consistent CMS subsystem for the University of Houston. The proposal outlined methods to eliminate these inconsistencies and an approach to implement the new subsystem. An implementation team then began setting up goals. They decided to start on internal enhancements and additions. Software and commands added to the system needed to be more thoroughly integrated into the system. User Services is currently coordinating this project with the Operating Systems group to determine feasibility and affects of proposed changes on system performance.

Besides being able to use CMS easily, our users should be able to access easily the specialized hardware devices available for their use. This ease of access is limited by the fact that not everyone uses the same machine or operating system. We have set up a file transfer system to facilitate moving files from one machine to another. In doing so, we have had to deal with getting specialized output from one machine to print on another.

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Text processing is our last major area of software development. We are currently developing our own IBM Generalized Markup Language (GML) tag sets to be used with the IBM SCRIPT/VS formatter. We started developing these sets for internal use in our publications and short course materials. We eventually plan to make the sets available to users for writing theses, reports, and proposals. As text processing activities on campus increase, these GML sets will eliminate much user frustration and many consulting calls.

In the future we will continue to simplify the use of complicated operating systems, make specialized hardware available to all users, incorporate new hardware into the system, and create user friendly software for nontraditional users. The final step of software development is the beginning of the creation of a new and more active role for User Services.

The foundation for this new role will be the restructuring of services to enable users to become more independent. They will be able to rely on hardware and software that is easy to learn and use; they will have access to documentation and educational programs that they can use at their convenience; and they will be able to turn to consulting groups that are familiar with the problems of their special fields. Consequently, our User Services group will be free from low level tasks that previously prevented us from developing an efficient computing environment and maintaining state-of-the-art computing on campus. In turn, this new, efficient computing environment will allow students and instructors to reach new heights of creative research.