



CONSULTING SERVICES AND THE SOCIAL SCIENCES:
COMMUNICATION AND COOPERATION

by

Ronn J. Hy
Peter B. Nelson
William L. Waugh

Department of Political Science
University of Mississippi
University, Mississippi 38677
(601) 232-7401

Using the computer to process data has become so indispensable to business and government that it is now being taught in an inchoate form to nearly all social science students. The principal reason the computer has become so important is obvious: the machine makes it possible to process large quantities of data quickly, conveniently, and accurately. Thus, knowing how to use the computer is essential for social scientists because they often are employed by public officials and agencies that increasingly are being required by law and administrative necessity to collect, retrieve, analyze, and ingest vast amounts of data.

Edward Hearle and Raymond Mason suggest that this data gathering and analysis tendency is irrevocable, principally because of population increases, governmental expansion, and administrative professionalization. More specifically, Hearle and Mason have listed eight recognizable trends that will force officials to computerize data. They are:

1. Population will increase, particularly in urban areas
2. State and local government services will expand, probably faster than population growth
3. Within the organization of state and local government agencies, the leadership and control of the central executive officer will increase, and consequently the independence of functional departments will decrease
4. There will be continued expansion in intergovernmental relations
5. Some form of area government for dealing with metropolitan problems will evolve in many places

6. Certain functions will expand rapidly as state and local governments respond to demands for public services
7. Revenues to support these growing services will continue to be scarce, and it seems likely that the broader revenue base available to state governments will increasingly be drawn upon to provide support by means of subventions to local governments for functions performed at the local level
8. The administration of state and local governments will become more professional.¹

Emanating from these trends, which will continue at least for the foreseeable future, is the need for social scientists who have at least an elementary comprehension of computer operations. Stated another way, social science students who enter the labor market without at least a rudimentary knowledge of a computing system are at a distinct employment disadvantage. It is incumbent upon social science departments, therefore, to provide students with skills necessary to gather and process computerized information.

Fortunately most, though not all, social science departments are attempting to provide their students with some understanding of computer operations, primarily by offering both graduate and undergraduate courses that focus on research methods, statistics, and data processing. Many departments, however, are finding it difficult, if not impossible, to teach computer-based courses because of severe and inflexible budgetary restrictions.

Since the resulting financial exigencies unfortunately prevent departments from purchasing expensive equipment and from hiring skilled personnel to teach relatively small classes, social science instructors are beginning to utilize computing centers and rely increasingly on user services consultants to help them teach the computer modules of research methods courses. (Small colleges which cannot afford to hire any computer-knowledgeable instructors are especially dependent on consultant assistance.) Because of this rapidly expanding interdependence, social science instructors must work closely and communicate frequently with user consultants.

Consequently, consultants must realize that social science students have dissimilar needs and perform different tasks than do engineering, natural science, and mathematics students with whom consultants customarily deal. Table 1 shows some, though by no means all, of the principal data processing tasks that social science students are most likely to be required to conduct. To perform such tasks as those listed in Table 1, students need not know a great deal about either complex computer programming or its intricate operations. What students do need is enough basic knowledge about the computer's hardware and software to be able to converse intelligently with professional programmers.

More specifically, students should be able to comprehend:

1. Components of the computer and the relationships among those components
2. Unique operational characteristics of the computing system (e.g., the job-control language to access and retrieve data)
3. Procedures and techniques of data manipulation and statistical analysis available primarily with packaged statistical programs.

While the easiest way to learn how to use the computer is to actually process data--commonly referred to as "learn by doing"--consultants must realize the problems inherent in this pedagogical approach. In the first place, the mere mention of the word "computer" generally drives social science students into a state of hysterical frenzy, possibly because they perceive the machine to be a mystical, formidable, complicated, and troublesome abomination rather than a tool that can be used to decrease workload and increase efficiency and accuracy.

Many, if not all, students are intimidated by the complexity of the machine's operations because they have neither the background nor the aptitude for understanding either the computer or its concomitant function, calculating statistics. It is imperative, therefore, for the user services consultants to allay students' anxieties by helping them comprehend the logic behind computer operations as well as familiarizing them with the hardware itself.

Before consultants can overcome students' anxieties, they must realize that social science students normally are ill-prepared in mathematics. In this area, prior to entering a university (or college), most social science students have had courses in only high school algebra and geometry. Moreover, the students, while enrolled at a university, are required to take few--if any--mathematics courses; and then in all likelihood they circumvent that requirement by substituting a nonmathematical science course such as biology or geology. In effect, students usually exercise options that severely limit their mathematical aptitude.

Thus user service consultants must expect to deal with students who not only have virtually no mathematical background but also have an antipathy toward mathematics. Consequently, there is a substantial interstice between what students know and what they need to know. To assume, however, that all social science students are mathematical and statistical illiterates would be erroneous. Nevertheless, for the foreseeable future user consultants can expect that students seeking assistance will come to the computer center with an enormous amount of trepidation and inadequate mathematical background.

General Prescriptions

To service students effectively, consultants must develop and promote communication with two primary groups--² social science instructors and students. Of the two, communication between consultants and instructors is the more crucial because it is the foundation upon which all other communication is built. After all, consultants can provide only limited aid to students if instructors fail to communicate each students' needs and course requirements to the consultants. (Students are hardly in a position to do so.)

Communication of each discipline's needs which differ drastically among the social sciences is essential because user consultants customarily do not have a social science background that would

TABLE 1

A TYPOLOGY OF DATA PROCESSING TASKS

Type	Activity
1. Record keeping	Facilitating manageable storage and easy updating of nearly unlimited amounts of information (e.g., crime reports, voter registration files, land use files, accounting ledgers)
2. Calculating and Printing	Sorting, calculating, and printing stored data (e.g., payroll processing, utility billing, mailing lists, budget preparation)
3. Record searching	Accessing and searching data files by defining parameters, retrieving certain cases from a file with speed and accuracy (e.g., criminal investigation, warrants, parking tickets, jury selection)
4. Recording restructuring	Reorganizing, analyzing, and summarizing data from diverse sources for managing and planning purposes (e.g., program budgeting, information, and referral)
5. Process control	Steering and monitoring a system's performance standards (e.g., police dispatch, water distribution, fire and ambulance dispatch, traffic signal control)
6. Sophisticated analyses	Utilizing complex visual and mathematical methods of analysis such as simulation and manipulating data about various interdependent phenomena (e.g., estimating appraised property values, forecasting revenues)

SOURCE: Compiled from James N. Danziger, "Computers, Local Governments, and the Litany to EDP," Public Administration Review, 37 (January/February 1977), p. 30.

enable them to discern the rapidly changing needs of each discipline. It is incumbent, then, upon consultants as well as instructors to keep the lines of communication open.

Several benefits can accrue from well developed and open communication lines. First, consultants should be able to evaluate the strengths and weaknesses of departmental instruction and course requirements. Then, too, with assistance from the computer center each department should be able to upgrade its computer-oriented modules by providing ameliorated instruction. Toward this end, user consultants may be able to supply instructors with supplementary material prepared by the data processing center. Thus, students will be introduced to and provided with information which will show them how to utilize computer hardware and software. Finally, students as well as instructors should begin to realize and appreciate the services being rendered to them by the computer center.

Besides opening communication lines with instructors, consultants should communicate with social science students. Such communication lines are formed when consultants help students achieve their immediate objective (e.g., conducting independent research and completing course assignments). There are, to be sure, various ways to develop such communication.

First, consultants should provide basic information about the kinds of available services and the types and locations of various hardware and software components. For instance, user services should publish and supply at a nominal cost a pamphlet containing information such as the types of computing equipment available to users, the places on campus where that equipment can be found, lists of easily accessible preprogrammed statistical packages, hours the computer center is open, work schedules of user consultants, and perhaps names of both students and instructors who can assist students when the consultants are unable to do so or are not on duty.

Such a pamphlet also should include various sets of computer operating instructions. By providing students with the access and retrieval commands necessary to operate the computer, consultants can increase computer efficiency by reducing the number of possible errors students will make, lessening student dependence upon consultants themselves, and decreasing student frustration and anxiety. Consequently, the time expended developing a readable pamphlet will be time well spent.

Another way in which consultants can help social science students learn about a computing system is to video tape presentations which show a person how to use the computer. Thus, students can view and review the instructional presentations at their own leisure. More important, however, is that students can see a person actually use the hardware and software while he is explaining how to use it. Though the consultant may still have to supplement the video tape shows with individualized instructions, he still can reduce the number of separate presentations that have to be given during the year.

These two instructional aids--pamphlets and video tapes--generate three specific benefits: (1) users are exposed to consistent instruction, (2) instructors can spend more time on course substance and less on operating techniques and commands, and (3) both consultants and instructors are freed from performing highly repetitive and time consuming tasks.

Still another way in which consultants can open communication lines between user services and student users is to develop a healthy attitude toward social science students. User services consultants should refrain from treating students as fumbling computer illiterates and view their problems as challenges to be met. Maltreatment is readily apparent to students, especially social science students who already are painfully aware of their computer ignorance. Helpful attitudes can evolve quickly by employing sound and effective consulting skills and by caring enough to take time to recognize and respond to the particular and specialized needs of social science students.

In summary, the factors that affect the user services consulting process are as follows:

1. Personal characteristics (e.g., helpful attitude)
2. Cooperation between instructors and consultants
3. Multidisciplinary knowledge and specific expertise in the social sciences

User services consultants can enhance greatly their value to social science students by developing and nurturing communication among instructors, students, and themselves. The more open the communication, the less time consultants will need to spend on student problems.

Specific Recommendations³

The specific recommendations to increase communication and cooperation between user services consultants and social science instructors are as follows:

1. Establish permanent lines of communication between the computer center and departments using computer facilities
2. Set up periodic conferences between instructors and consultants with the following goals: orienting consultants to course objectives and content, orienting instructors to services available, and appraising jointly the effectiveness of pedagogical approaches.
3. Invite instructors who utilize computer facilities to participate in user services workshops and symposia
4. Arrange social science orientations--conducted by social science users--for all new consultants
5. Encourage the hiring of consultants with social science backgrounds when economically feasible and warranted by extensive computer use by social science students.
6. Provide instructional materials designed to supplement departmental instruction concerning data processing, with adequate provisions for differing levels of expertise among social science students (e.g., handbooks, users manuals, and audio-visual aids).

These recommendations by no means are directed solely to user services; inter-departmental and consultant-instructor communication necessarily requires cooperation and participation by all involved parties. The focus has been on consultants because they are in a better position to encourage and coordinate all cooperative efforts.

The specific recommendations to increase communication and cooperation between user services consultants and social science students are as follows:

1. Arrange for computer center tours to familiarize students with computer components and facilities and with user services consultants (such tours should be in groups small enough to permit each student

to become familiar with the computing system)

2. Set up orientation sessions explaining all the preprogrammed procedures available at the computer center; it should focus on, but not be limited to, those packaged programs that are used in the social sciences
3. Present a brief introduction to FORTRAN and COBOL for students who will not be using these languages but need some knowledge of them to converse with professional programmers
4. Encourage students who are having difficulty operating the computer and/or understanding its operations to seek consultant assistance.

Armed with these recommendations, consultants hopefully can optimize a computer center's user services division.

NOTES

¹Edward Hearle and Raymond Mason, A Data Processing System for State and Local Governments (Englewood Cliffs, N.J.: Prentice-Hall, 1963), pp. 25-27.

²Communication between instructors and students is equally important but is not discussed because we feel that it is beyond the scope of the paper.

³The recommendations, for the most part, are ones that have increased immeasurably the responsiveness, effectiveness, and efficiency of the user services division at the University of Mississippi. We, therefore, feel that these recommendations can be implemented successfully with fruitful results.