ADAPTING FEATURES FROM A LARGE HOSPITAL SYSTEM TO MICRO COMPUTERS

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Abstract

During the 1981 SCMC, the author presented a paper entitled, "A COMPUTER DATA BASE FOR CLINICIANS, MANAGERS AND RESEARCHERS," describing the Computer System at the Salt Lake VA Medical Center. Following the Symposium, there were many requests for information about the system from all over the United States, Canada and Australia. The Veterans Administration software is in the public domain. However, the mental health part of the system includes approximately 80 psychological tests and about 20 interviews, many of which are copyrighted by various publishers. Upon request and upon receipt of individual copyright agreements, we have furnished portions of the software to individuals who have access to comparable computer systems operating in MUMPS. There were many requests for similar applications for micro computers. The software was initially designed for a fairly large system and without considerable modification would not run on a micro computer. The author with two others adapted the software on their own time with private resources.

Introduction

The VA computer system uses the Massachusetts General Hospital Utility Multi-programming System (MUMPS) language and operating system. This system was chosen because of the efficiency with which MUMPS handles textual data, and the ease with which it moves data to and from disk storage. The first step was to obtain a micro computer that would operate with MUMPS. We requested and received support for Apple-MUMPS from Micronetics Design Corporation, Inc. (1) We recognized that to have wide application the software would have to run on some relatively small systems. We started with an Apple II with 48K RAM memory and one floppy disk drive for 5 1/4 inch single density disks. By re-writing the programs to reduce their size, we have been able to put the necessary software and psychological test information on one disk to administer, score and print results from 1 to 5 different psychological tests. To meet copyright criteria, we received authorization from Consulting Psychologists Press (2) to use some of their tests in the developmental process. Initial contact has also been made with other copyright holders. The computer diskettes are prepared for a discrete number of administrations after which the files containing the questions and scoring information are automatically erased. They are also copy protected to preclude copying the original disks supplied by the copyright holder or authorized distributor. Sale of the diskettes will provide the copyright holders with the appropriate royalty fee. Since several people indicated they would prefer to purchase test materials for paper-pencil administration and wanted computer scoring only, a second version of the software was developed for diskettes without copyrighted items for unlimited scoring of tests after "clerk" entry of the responses.

Adapting Process

Because of the initial requests the project was designed to adapt the psychological testing capability to micro computers. Some work has also been done on adapting some features from the pharmacy system to micros. Micro-MUMPS works very well and performance rivals, and in some cases surpasses, that of the VA's relatively large system. To avoid having to re-type all the information into the micro computer, we linked the two computers together to transfer data. This became much more time consuming and laborious than originally thought. Although it is very easy to transfer a small amount of data, there were complications in moving entire files. For some reason the two computers would get out of synchronization and we either wound up with garbage or with error messages. Finally after turning off the echo on both machines, checking line lengths and verifying accuracy, we were able to successfully transfer, error free. The procedure is slow, however, and with our equipment we were able to transfer faster than 300 baud. The next problem concerned presentation on the screen. All of the CRT terminals in the VA system have 80 column screens. Many micros, including the one we used, have a 40 column screen. Consequently, many of the words were cut in peculiar places as they wrapped around and printed on the next line. The initial plan was to just use the procedures on systems that have 80 column cards and capability but we ran into difficulties getting the first 80 column card that we tried to operate in MUMPS. The second idea was to use the data in 80-column format but with a software routine to convert
to 40 columns before sending it to the screen. Due to complications with the different tests and test drivers, the solution decided on was to convert all the data to 40 column format before storing on the micro diskettes. This worked out very well and the screen presentation now is pleasant and easily readable. For individuals who desire the 80 column format, it is available.

After getting the tests to run, the next steps were to establish the accounting procedures, and at the request of Consulting Psychologists Press, to display the copyright statement on the screen and on the printed report. Because we were only able to pursue the project part time and experienced numerous unanticipated problems and technical difficulties, it took about 10 months to get everything working. The micro system now works very efficiently.

For the individual with his/her own micro computer, s/he will be able to enjoy computer administration, scoring, interpretation and printing of psychological tests at a much lower cost and more rapid turnaround time than sending answer sheets to a scoring service or some of the other alternatives for computer scoring. Although there are several psychological test scoring systems for micro computers, (e.g., 3,4,5), I am unaware of any which have been adapted from a large system in a way similar to this project.

Illustration of the Micro System

Many of the features of the Micro System are the same as those reported in the 1981 SCAMC paper. Those that are pertinent will be mentioned here with illustrations given on the use of the system. When MMPS is operating on the system according to the instructions given by the MMPS supplier, this system is activated with the log-in program. When a name is entered, the computer first does a search to see if the individual is already on file. The search will find all those with similar names. Figure 1 illustrates what the CRT screen looks like when the program is initiated.

<table>
<thead>
<tr>
<th>DATE: T (OCT 14, 1983)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLIENT NAME (LAST, FIRST) OR ID#:</td>
</tr>
<tr>
<td>NAME OR ID: GOTTFREDDON, DOUGLAS K.</td>
</tr>
<tr>
<td>NAME</td>
</tr>
<tr>
<td>GOTTFREDDON, COLETTE</td>
</tr>
<tr>
<td>DO YOU WANT TO ADD THIS CLIENT? N//Y</td>
</tr>
<tr>
<td>SEX (M OR F): M</td>
</tr>
<tr>
<td>DATE OF BIRTH: 1-27-33 (JAN 1, 1933)</td>
</tr>
<tr>
<td>CLIENT ID#: 3050</td>
</tr>
<tr>
<td>GOTTFREDDON, DOUGLAS K.</td>
</tr>
<tr>
<td>OK? YES/</td>
</tr>
</tbody>
</table>

Figure 1. Log-in Procedure

If a number is entered in response to the "NUMBER:" prompt, the computer will store test data under the file of the individual found in the search. On the other hand, if carriage return is entered, the computer will ask if you want to add the client, in which case the minimal information used in test scoring is requested. The ID# is required to differentiate between two individuals of the same name. It can be the last 4 numbers of the Social Security Number or any number of digits from 3 to 9 digits. When the client has been added, the CRT screen will next request the desired option as shown in Figure 2.

| T = START TESTING |
| P = PRINT TESTING REPORT |
| B = SEE BALANCE |
| WHICH OPTION: T |
| ADMINISTER THE FOLLOWING TESTS: |
| TEST: STAI |
| TEST: |

Figure 2. Option Selection

The testing option allows sequential presentations of any number of tests available on the diskette. When carriage return is pressed in response to the "TEST:" prompt, the first test will be started with the copyright statement as shown in Figure 3.

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Figure 3. Copyright Statement

Test instructions are then presented and the tests administered as shown in Figures 4 and 5.
I FEEL CALM
1. NOT AT ALL
2. SOMEWHAT
3. MODERATELY SO
4. VERY MUCH SO

ANSWER = 2

Figure 5. Sample Test Item

Features in the software allow the person taking the test to back up one question at a time if a wrong answer was entered. It is also possible to terminate a test early (for example, for a lunch break) and restart the test later at the next item following the last one completed before termination. Tests can also be taken with paper and pencil (such as for group testing) and later entered into the computer in "CLERK" mode. The "CLERK" mode is illustrated in Figure 6.

Figure 6. Sample of Clerk Entry

In "CLERK" mode the answers can be entered as fast as the keys can be pressed. There is also the capability of entering the items with a card reader such as the Chatsworth, which provides additional flexibility for group administrations of tests. Test results are printed out in a format such as is shown in Figure 7.

Figure 7. Sample Test Report

The "SEE BALANCE" option allows a review of the number of tests given and the amount remaining as shown in Figure 8.

```
ACCOUNT BALANCE
BEGINNING BALANCE $50.00
TEST  # TESTS  PRICE  AMOUNT
ACL  1  $1.00  $1.00
CPI  1  $2.00  $2.00
STAI 8  $0.50  $4.00
TOTALS 10  $7.00
ENDING BALANCE $43.00
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Figure 8. Sample Account Balance

"BALANCE ONLY: can be selected to see just the ending balance figure. If a test is requested when the ending balance is $0.00, the message "BALANCE IS $0.00, NO MORE TESTS CAN BE GIVEN." is written on the monitor and it returns to the OPTION menu. A limited number of test results can be retained on the diskette or the results can be saved on another diskette for research purposes.

Summary

The psychology test and interview package of the Salt Lake VA has been successfully adapted for use on micro computers. The software is currently being used for psychological testing reports and provides results in 5 to 10 minutes. It would take from 30 minutes to several hours if hand scored and comparable reports were typed. This system provides an additional alternative for psychologists who have their own micro computers.

References

1. Micronetics Design Corporation
   932 Hungerford Drive Suite 11
   Rockville, Maryland 20850

2. Consulting Psychologists Press, Inc.
   577 College Avenue
   Palo Alto, California 94306

   600 Reisterstown Road
   Baltimore, Maryland 21208

4. Precision People, Inc.
   3452 North Ride Circle, S.
   Jacksonville, Florida 32217

5. Psychological Software Specialists
   1776 Fowler Suite 37
   Richland, Washington 99352