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**The HUBNET User Survey: User Assessment of a Biomedical Resources Network**

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**BACKGROUND**

HUBNET, a regional Wide Area Network of health and biomedical resources, was developed in 1993 as a collaborative project between the State University of New York at Buffalo School of Medicine and Biomedical Sciences, the Library Consortium of Health Institutions in Buffalo, and the Western New York Health Sciences Consortium. The acronym HUBNET stands for Hospitals and University at Buffalo Library Resources Network, and the State University of New York at Buffalo is locally known as the University at Buffalo or UB. HUBNET was established in order to provide improved communication between the medical school and students, and residents and faculty working at clinical sites through an electronic mail component, and to allow remote access to numerous support resources such as bibliographic databases, drug databases, and full-text reference sources (this was particularly important because UB, unlike many medical schools which are associated with a single teaching hospital, has eight affiliated teaching hospitals at which medical students, interns, and residents have clinically based training and rotations). Institutional membership is available by subscription to affiliated hospitals and healthcare organizations. As of September 1996 eight teaching hospitals, HealthCarePlan (an HMO) and UB subscribed to HUBNET and there were a total of 4,569 registered HUBNET account holders.

At the time of the survey, HUBNET was accessible through three modes: direct network connection that allowed access to the full collection of resources using a Windows interface, dial-in access using PCAnywhere communications software, that allowed access to some HUBNET resources, and basic dial-in or Telnet access that provided access to the bibliographic databases and electronic mail component.

## **SURVEY DEVELOPMENT**

During the summer of 1996, HUBNET administrators were looking for ways to obtain user feedback to assist with application acquisition and retention decisions. They started monitoring usage figures for those HUBNET applications that allowed it, and also decided to poll the reference staff at member institutions to see how useful they felt the various applications were. A survey of the users themselves was undertaken in order to complement the other data.

The initial objective of the survey was to elicit information from users about each application including 1) frequency of use, 2) perceived importance, and 3) ease of use. As the survey evolved, the purpose was broadened, and questions related to technical support and training opportunities were added. Several drafts of the survey were critiqued by Professor George D'Elia, a UB library school faculty member, and Linda Lefauve from the UB Office of Institutional Analysis. Successive drafts were also reviewed by the Library Consortium of Health Institutions in Buffalo Board. The survey was pretested by 41 users who were either members of the HUBNET Advisory Committee or personnel from the Office of Medical Education. Pretesting prompted additional modifications to the survey.

## **SURVEY ADMINISTRATION**

The HUBNET User Survey was made available in online form for a three-week period (September 16-October 10, 1996) by using Microsoft Access 2.0 to create a series of online forms. Account holders with access to the networked version of the system were asked to fill out the survey online if possible in order to reduce the amount of subsequent data entry required. Only users with valid HUBNET accounts were allowed to take the survey, and each account holder could take the survey only once. Users who did not have access to the networked version of HUBNET were urged to request a paper copy of the survey. HUBNET users were notified about the survey by e-mail, campus mail, and/or U.S. mail. HUBNET member institutions promoted the survey, and posters were distributed to all relevant university departments. In addition, the survey was announced on the HUBNET news screen which notifies users about problems and other news -- this online "splash screen" is viewed by all users when accessing HUBNET.

After the survey had been online for three weeks, the deadline was extended for ten days to increase the response rate. Afterwards, two lists of non-respondents were generated: One was a list of frequent users who had used the system within the previous 30 days, and the other was a list of infrequent users. Eight hundred users were sampled from the frequent user list (every 5th name on the list) as well as two hundred users from the infrequent user list (every 6th name on the list) for a total of 1000 surveys. A higher percentage of frequent users were sampled because it was believed that many infrequent users had actually left the University and were no longer using the HUBNET system at all. For this reason, it was also more difficult to locate addresses for infrequent users. Paper copies of the survey were mailed to these selected users. Pre-addressed, postage-paid envelopes were included to make it easier (and thus more likely) for respondents to return the surveys.

Users were allowed one month to complete and return the paper surveys. Two students were then hired to input the survey data into the Microsoft Access database. This data was entered into the same database that contained the information input by the online survey takers. A third set of forms was created to manipulate response percentages. Comments were compiled separately and placed into text files, one for each question that asked for comments or other write-in responses.

## RESULTS

A total of 498 surveys were completed online, and 361 more surveys were completed in paper form, for a total of 859 surveys. The total response rate was 19%. Unfortunately, 80 surveys were incomplete and thus deemed unusable. If those surveys had been usable, the response rate would have risen to 21%.

The gender breakdown for respondents was 55% male and 45% female, and the average age was 37 years. Faculty, physicians and medical students accounted for 43% of the respondents. Most of the respondents (40%) considered the University to be either their primary affiliation, the place where they spend the most time, and 64% listed the University as their secondary affiliation.

On average, respondents indicated that they used HUBNET 12 times per month. However, approximately half of the respondents indicated that they accessed the system less than once per quarter. Fifty-four percent identified themselves as "intermediate" level HUBNET users, with 20% indicating "novice" status, 20% electing "advanced" status, and 5% considering themselves to be "expert."

Four out of five respondents reported that they used the networked/Windows version of HUBNET and 63% indicated that they used dial-in or Telnet access. Almost the same percentage of respondents said that they accessed HUBNET from their office or lab (50%) as those that did so from the Health Sciences Library (49%). Nearly 41% indicated that they connected to HUBNET from home. The majority of respondents (64%) indicated that they used HUBNET e-mail, 6% of whom said that e-mail was their sole reason for using HUBNET.

Most respondents (60%) stated that HUBNET was the only computerized health information source that they use. Not surprisingly, MEDLINE was the most often used database with 94% of respondents indicating that they had used it. The second and third most often used databases were CURRENT CONTENTS (40%) and CANCERLIT (26%).

Of the 32 full-text reference sources available through HUBNET, the three most often used were: the MERCK MANUAL (62%), STEDMAN'S MEDICAL DICTIONARY (50%), and HARRISON'S PRINCIPLES OF INTERNAL MEDICINE (46%). A total of 15 full-text journals were made available through two vendors, Creative Multimedia Corporation and Macmillan New Media. Usage rates for these two collections were 31% and 30%, respectively. (Parenthetically, these full-text journal collections were later removed and replaced with the Core Biomedical Collections available from Ovid Technologies, the same

vendor that provides the HUBNET bibliographic resources. This allowed for a common user interface and search engine, and hypertext links between the bibliographic citations and the corresponding full text.)

Four drug databases were provided through HUBNET. The PHYSICIAN'S DESK REFERENCE was the most often used drug resource (41%). ASKRx, CLINICAL PHARMACOLOGY, and CLINICAL REFERENCE LIBRARY were used less often (17%, 13%, and 11%, respectively). HUBNET also provided access to newsgroups, the World Wide Web via MOSAIC, and Gopher resources. Of these resources, HUBNET e-mail was the most often used (70%), followed by MOSAIC (44%), newsgroups (28%), and Gopher (14%).

With regard to training opportunities, thirty-one percent of respondents felt that they had not received adequate instruction in how to use HUBNET. Twenty percent of respondents said that there were not enough HUBNET training opportunities. Twenty-three percent of respondents felt that HUBNET technical support was inadequate. These response levels indicated that instruction, training and technical support were three areas where improvement was definitely needed.

The HUBNET User Survey included a question which read: "As a result of the information you received from HUBNET did you (or will you) handle any aspect of a clinical or other situation differently than you would have handled it otherwise?" The HUBNET administrators were gratified to hear that 68% of respondents answered "definitely yes" or "probably yes" to this question.

Comments in response to individual questions and general comments at the end of the survey covered a variety of topics. Most comments were able to be sorted into a few categories. Many users expressed frustration with the variety of HUBNET access modes, interfaces, and platforms. As I mentioned, users could access HUBNET in three ways: direct network connection, PCAnywhere dial-in or Telnet connection. The interfaces for each of these access modes was different and a different group of resources was available from each mode of access. Finally, HUBNET was available from PC's and Macintoshes which led to differences in the ways in which HUBNET could be accessed. The need for more training opportunities and better documentation, and concern about the future of the electronic mail system were also heavily represented among the comments.

## **FOLLOW-UP**

Many users requested that someone respond to their comments. These comments were sorted by HUBNET institution and then forwarded to the appropriate institutional library for response. Short articles were also published in the campus paper summarizing the survey results and reporting on future plans for HUBNET's availability via the World Wide Web.

## **DISCUSSION**

The HUBNET User Survey was created in order to poll HUBNET account holders about their usage of HUBNET and its applications, as well as their opinions about training

opportunities and technical support. These objectives were met and, in addition, a lot of other useful information was obtained from this survey. Notably, the importance of HUBNET to the local healthcare community was validated when 68% of respondents indicated that they had handled a clinical or other situation differently than they would have otherwise because of HUBNET.

The survey results, including many user comments, also proved to be particularly useful in the planning process for HUBNET's World Wide Web-based successor, HUBNET2. The move to the World Wide Web was in great part justified by the numerous complaints about confusion surrounding the many ways to connect to HUBNET, and requests by users to move to a Web-based environment. Additionally, decisions about which applications to include on the new system were easier to make with data to support their retention.

The large number of respondents who indicated that they connected to HUBNET remotely in one way or another was a good indication that planning for HUBNET services from the remote user's perspective was required. Training, technical support, and documentation are particularly critical areas of concern to remote users.

Despite the usefulness of the survey data, the results are not necessarily representative of the opinions of HUBNET account holders as a whole. The 19% response rate was not high enough to enable us to make broad generalizations about the results. Conversely, individual HUBNET institutions would have liked to obtain information specific to their own clientele, but the relatively low response rate and unreliable nature of the user database did not allow for the stratified sampling that would have been required. Due to the low response rate, detailed analyses of the data (e.g., cross tabulations between application usage and perceived importance or application usage and ease of use) were not attempted.

Several factors influenced the low response rate and our inability to make generalizations from the survey results. The primary problem was that the HUBNET user database was not up to date so that we were unsure who was a member of our population and who was not. A mechanism for removing a person's record from the database once they were no longer affiliated with a participating institution did not exist. User relocations from one institution to another (e.g., from the medical school at UB to one of the local hospitals), as well as position title changes, were not reflected in the database. Again, this was the reason why we could not do stratified sampling since we were not confident about the institutions to which users belonged. Additionally, address and phone information was not included for each user record. These factors made locating non-respondents difficult, and meant that some of the people we were trying to contact were no longer HUBNET users - we came to call these people "phantoms."

The length of the survey (25 questions, 6 intricate tables, 6 pages long) may have posed an obstacle to some respondents or potential respondents. Another unexpected problem was the manner in which the survey was stapled together. Although we were able to have the survey duplicated for free, the duplicating service was only able to staple the survey in the upper right-hand corner. This appeared to confuse some respondents who sometimes left a page blank, and also confused the data entry personnel. This problem did not arise during the

pretesting stage since we stapled those few surveys by hand in the usual upper left-hand corner position.

A few problems related to the computerized nature of the survey also arose. The online version of the survey was designed such that once users started taking the survey, they could not exit midway through unless they turned off the computer they were using. Several people did turn off their computer - perhaps frustrated by the length of the survey or for some other reason -- thereby crashing the entire database and preventing others from using the system until the problem was fixed. A remedy was found that allowed the database to be "repaired" after a crash, but crashes still continued to occur from time to time. Also, students inputting data from the paper surveys could only move through the Access forms in sequential fashion. If they wanted to go back and change an answer, they could only do so by deleting the input for that survey and starting over.

## CONCLUSION

The HUBNET User Survey was successful in that it elicited feedback from users at a time when such feedback was critical to the evolution of the HUBNET system, and also served as an additional means of communication between users and HUBNET administrators. The survey results were enriched by respondents' comments, which led to feedback in unexpected areas, such as the demand for Web-based access, and some dissatisfaction with the HUBNET access and support available for Macintosh users. In another area, a respondent complained that the nesting of databases was confusing, that certain databases were hard to find, and offered to assist in designing a new configuration. If respondents had not been allowed the opportunity to comment, we could have simply received answers to the questions we asked. With comments, we received a whole lot more.

## UPDATE

HUBNET<sub>2</sub>, the Web-based version of HUBNET, is now fully operational. The primary benefit of making HUBNET available through the World Wide Web is that now everyone can access the full complement of HUBNET resources through a single interface and across multiple platforms -- PC, Macintosh, or UNIX. A new technical operations manager has been hired who is extremely responsive to user complaints and suggestions. He has created two listservs, one for the dissemination of information by HUBNET staff, and the other an open forum in which users can participate. A student assistant has also been hired as the Webmaster for the HUBNET<sub>2</sub> site. Additionally, two interns are in the process of writing new documentation for the HUBNET<sub>2</sub> system. HUBNET e-mail, which required a great deal of staff time to maintain and sometimes interfered with the availability of the other resources, was taken over by Office of Medical Computing last year and was renamed MEDMAIL. The HUBNET User Survey played an important role in the transition from HUBNET to HUBNET<sub>2</sub>, and HUBNET<sub>2</sub> is all the better for having had the benefit of user feedback during its developmental stages.

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