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ABSTRACT

The emerging field of assistive technology offers employment and independent living for people with disabilities. However, agency staff, people with disabilities, and their guardians often spend substantial time finding appropriate technological solutions. The integration of technology into the existing service system is needed to maximize scarce resources. Based on Texas's long history of exploring technology for people with disabilities, funds were awarded in 1985 on behalf of the Texas Planning Council for Developmental Disabilities (TPCDD) for a 4-year project to develop and test a system change model to integrate technology into the local service delivery system. This report contains a detailed description of the project, the results of the model tested, and the revised model, and provides statewide and local recommendations for its use. The Integrating Technology into Service Delivery (ITSD) model was successful in implementing an electronic mail and bulletin board system with 290 subscribers. A resource database was also created, the Developmental Disability Technology Library, which contains over 6,000 entries. The ITSD model, with varying success, also attempted to involve agency and formal industries in ITSD activities, distribute computers and other equipment to agencies and individuals, increase public awareness of ITSD functions, provide workshops, and develop computer software. A Local Assistive Technology Services Network (LATSN) model was developed based on ITSD successes and failures. LATSN service categories include: (1) broker, coordination, developer, think tank; (2) device examination and prescription; (3) training and technical assistance; (4) information analysis; and (5) non-core services and projects. Appendices contain samples of electronic mail messages, tables presenting services usage data, a list of donated equipment, an article about the service technology at the University of Texas at Arlington, and a prioritized list of needs in a state plan for technology-related assistance. (4 references) (DB)

Integrating Technology Into Service Delivery (ITSD) Project: Final Report

December 1990

A project of the Texas Planning Council for Developmental Disabilities, funded by the Texas Rehabilitation Commission.

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Executive Summary

Introduction and Background

The emerging field of assistive technology offers employment and independent living for people with disabilities. However, agency staff, people with disabilities, and their guardians often spend substantial time finding appropriate technological solutions. The integration of technology into the existing service system is needed to maximize scarce resources. Based on Texas's long history of exploring technology for people with disabilities, funds were awarded in 1985 on behalf of the Texas Planning Council for Developmental Disabilities (TPCDD) for a four year project to develop and test a system change model to integrate technology into the local service delivery system.

A consortium composed of The University of Texas at Arlington (UTA), Graduate School of Social Work, UTA Department of Continuing Education, UTA Engineering Department, Center for Advanced Rehabilitation Engineering (CARE), The Bioengineering Program of the Association for Retarded Citizens of the U.S. (National Headquarters) (ARC/US) tested the following components of the model.

- An electronic mail and bulletin board system (BBS) at the ARC/US.
- A resource database searchable through the BBS at the ARC/US.
- Professional and consumer involvement individually and through committees.
- Working through local agencies.
- Equipment distribution including microcomputers to agencies and used equipment to individuals.
- Public Awareness (newsletters, media activities, presentations, I&R, and a resource directory).
- Workshops on technology.
- Development and dissemination of training and knowledge distribution software.

Major Results and Discussion of the Model Tested

The Electronic Mail and Bulletin Board System (BBS), called The DD Connection, is successful with 290 current subscribers. It receives over 1000 calls a month with an average call duration of over 10 minutes. Although the BBS was designed for agencies, consumers are the primary users. Time constraints and personnel changes were reasons for lack of use by agencies. The DD Connection is mostly maintained by volunteers.

The resource database is called the DDTL (Developmental Disability Technology Library). It contains approximately 6000 entries on publications, vendors and agencies. An average of 48 persons use the DDTL monthly to conduct approximately 49 searches. The database is used for I&R and to produce a resource directory.

Agency and formal industry involvement in ITSD activities was difficult to achieve. However, volunteer and consumer involvement was higher than anticipated with approximately 4296 hours being volunteered. Working through local agencies was successful, especially since it avoided service duplication, encouraged change, and aided project continuation. ITSD activities will be continued by the ARC/US and the Ft. Worth Easter Seal Society.

Distributing 19 computers to agencies and much donated equipment to individuals was somewhat successful. Those receiving equipment needed ongoing training and attention to keep them involved in ITSD activities. Equipment does not encourage networking, but allows it to happen once the motivation to network exists.

Public awareness activities focused on agencies rather than the public. ITSD distributed two issues of its newsletter, 1500 brochures, and made 127 conference presentations/exhibits. More than 1,191 requests for information we received. Most requests concerned how to locate and fund technology. A 140 page, 291 entry Texas Resource Directory on Assistive Technology was well received with 2000 distributed. ITSD staff were involved with P.L. 100-407 activities by developing a needs assessment report based on a statewide survey and seven public forums across Texas.

Twelve local workshops on topics ranging from funding of devices to theories of human performance measurement were offered to 437 attendees. The workshops were well received as indicated by high scores on the workshop evaluations.

ITSD had mixed results with software development. Over 1,148 copies of an ITSD overview disk and 1000 copies of a DD Connection training disk were distributed. One of the five planned knowledge distribution package on augmentative communication, called AUGMENT, was developed and 1,151 copies distributed. However, feedback on the value of AUGMENT could not be obtained. A second package called SMART (Software Module for Advice in Rehabilitation Technology) was planned and partially developed. The CARE Functional Assessment was evaluated and found too complex to associate with services or existing software.

The Resulting Model and Introduction to the Recommendations

A Local Assistive Technology Services Network (LATSN) model was developed based on ITSD successes and failures. LATSN service categories included (1) broker/coordination/developer/think tank, (2) device examination and prescription, (3) training and technical assistance, (4) information analysis and I&R, and (5) non-core services and projects.

The recommendations that follow are characterized by activities which build upon, leverage, and expand the existing system. Coordinated information collection and dissemination is at the core of many of the recommendations. The recommendations also try to empower people with disabilities to help manage the service delivery system. ITSD found that volunteers and consumers can become part of the service delivery system and be given greater control over service provision. Recommendations to the TPCDD follow.

Statewide Recommendations

Recommendation: An 800-number for statewide information on assistive technology should be established. This service should be coordinated with other state and local I&R efforts. The DDTL could continue to be the statewide assistive technology resource database and contract with Texas I&R providers to sell the list of resources in printed form or on floppy disk.

Recommendation: Statewide assistive technology projects should facilitate the development of pre-service and in-service training on assistive technology. Projects should be encouraged to work with local universities to place student interns into agencies which have technology as part of their mission. Contracts might be given to Independent Living Centers or others capable of bringing vendors, experts and providers together. These training sessions should be small (10-30 participants) and not over one day long. TPCDD should also sponsor agencies to put on technology events at local conferences.

Recommendation: Resource databases warranting statewide distribution should be collected and made available to all state services through a printed manual and on a easy to search floppy disk. For example, TPCDD could fund the development of a statewide database of peer counselors and the assistance they can provide. Any consumer seeking advice could call a local independent living center or 800 number to obtain the names of the closest peer counselors. This information could also be loaded into software and distributed via floppy disk and BBS. Several successful models exist, for example, the Texas Network for Children, Youth and Families, Inc. distributes a searchable floppy disk which matches children to out-of-home care providers.

Recommendation: A statewide system of local computer bulletin boards which contain information on disabilities and technology should be established, because BBSs are an efficient way to exchange information between professionals and consumers. The beginnings of this system exist with The DD Connection and other Texas BBSs which already carry information on disabilities and technology.

Recommendation: TPCDD should consider funding several LATSN startup projects in several major Texas cities. The hub services of broker, coordinator, facilitator, and think tank should be the first funded.

Recommendation: An effort should be made to develop mechanisms where industry could be involved with technology projects on a formal, coordinated, statewide basis. For example, the TPCDD might issue a Request for Proposals seeking projects which link industry with assistive technology services on a statewide basis.

Recommendation: Several model projects to use volunteers throughout the service delivery system should be tested. TPCDD could fund efforts to make use of volunteer and computer clubs. Each effort should produce a "how to" manual for agencies wishing to set up volunteer programs. The manual

should contain a list of do's and don'ts along with key factors for success and key issues which must be addressed. Software for volunteer management should be explored.

Recommendation: Television Public Service Announcements should be developed. These announcement should provide an 800 number for more information on technology and for referrals into the service delivery system. Those announcements should be aired only when the system is capable of responding to the expectations generated.

Recommendation: Statewide assistive technology projects should include an equipment donation program. The program should match needs to equipment rather than become a warehouse for used equipment. The program should designate personnel to ensure that equipment is evaluated and distributed.

Recommendation: A statewide registry of training experts and resources should be developed. This registry should include training software and video tapes on assessment and devices.

Recommendation: TPCDD should take measures to ensure that funded projects involving technology complement and are consistent with the overall State Plan for Assistive Technology submitted under P.L. 100-407.

Recommendation: Statewide technology projects that develop software should ensure that automatic data collection and dissemination on software performance be built into the software and project performance evaluations.

Recommendation: TPCDD should use universities to experiment with software development concepts and issues. Once a software solution is defined and found workable, the final product should be developed in an environment where reimbursement can be flexible and easily tied to periodic evaluations.

Recommendation: TPCDD should use software vendors to develop software in areas where the conceptual framework contained in the software is relatively stable. Vendor progress on software should be reexamined periodically and contract modifications made accordingly.

Recommendation: The final product of any software development effort should be easily updatable by agency staff.

Recommendation: Subscriptions to national electronic networks by TPCDD projects should be encouraged. However, usage criteria should be set up before the subscription begins and the use vs. cost should be evaluated quarterly. If use is not as expected and the information does not justify the cost, the subscription should be dropped.

Local Recommendations

Recommendation: Local assistive technology projects should ensure that I&R services are provided in electronic and printed form. If possible, database and desktop publishing tools should be used to permit easy updating, consumer access, and to lessen production costs.

Recommendation: Assistive technology projects should include funding for a volunteer coordinator to allow volunteers to augment publicly funded activities.

Recommendation: To help agencies integrate technology into services, agency management technology needs should be addressed when providing staff training on assistive technology for individuals.

Recommendation: Local assistive technology programs should accept physical donations of used equipment with caution and only if they have the capacity to evaluate the equipment. They should begin with used equipment by playing a broker role, i.e., keep a database of needs and potential donations. They should physically accept equipment only after they determine that repair and distribution time/costs are less than the purchase of new equipment.

Recommendation: Local assistive technology projects should provide support for electronic BBSs to enable consumers and providers to solve technology issues and share information without assistance from service providers.

Recommendation: When developing computing systems, use off-the-shelf proven software if possible. Systems requiring programming or the connection of independent software programs should be considered research efforts which might be subject to time delays and unexpected failures.

Introduction and Background

Today's society is in the process of viewing people with disabilities as potential assets. Both non-disabled and disabled members of society benefit by removing barriers and providing services which allow maximum independent living and employability. The field of assistive technology has emerged during the 1980's to offer new opportunities for work and independent living for people with disabilities. Most people have seen examples of these enhanced opportunities such as:

- A child with cerebral palsy communicating for the first time using a speech synthesis device.
- A bedridden person living independently with the help of computer controlled doors and appliances.
- A person with quadriplegia earning money by programming a computer using a mouth stick and using electronic communications to send and receive business mail.

Although the success stories are dramatic, they are few. Most successes go hand-in-hand with a long struggle to locate the appropriate experts in assistive technology, acquire the appropriate technologies, and provide the necessary follow-up services. Currently, we have a financially poor and uncoordinated service delivery system which is continually trying to catch up with fast moving technological developments.

The integration of technology is an important but difficult goal for both professionals and consumers. An integrated system should assess the client, find the most appropriate device, secure funding, and provide training and follow-up. Yet, each of these services requires very specialized expertise which is constantly changing due to rapid technological developments. Few universities can keep abreast of technological developments and provide specialized curriculum in technology provision.

Agency staff, people with disabilities, and their guardians often spend substantial time finding an appropriate technological solution. Given the scarce resources, the search may not be undertaken or might fail unnecessarily. This failure is destructive to everyone, including technology vendors who cannot continue to manufacture and research technological solutions. Successes will be the exception until technology becomes more integrated into the current service delivery system.

Background

Previous efforts

Texas has a long history of exploring the use of technology for people with disabilities. One of the first major efforts was a national and state endeavor in the early 1980's which came to be known as the IMPART (Innovative Matching of Problems to Available Rehabilitation Technology) project. This project developed technology related services in South Central Texas. Some of these services still exist today.

For the past six years, the Texas Planning Council for Developmental Disabilities (TPCDD) has sponsored projects which explored the potentials of technology for people with disabilities. Previous efforts included a 1984 Survey of DD technology use, a 1985 statewide conference on "Independent Living Through Computer Technology," and a computerized database of DD technology resources located at the Association for Retarded Citizens National Headquarters (ARC/US). While these previous activities were well received, they were "one shot" efforts that did not build a statewide service delivery strategy.

The RFP

A Request for Proposal (RFP) was issued by the TPCDD in the Fall of 1985 to take these previous efforts a major step further. The RFP solicited projects to develop and test a regional service delivery model for eventual statewide replication. The RFP issued by the Texas Planning Council for Developmental Disabilities was titled: Regional Rehabilitation Technology Services for Persons with Developmental Disabilities. The focus of the RFP was "a demonstration project to enhance the independent functioning of individuals with developmental disabilities by providing coordinated services and information about currently available technology and resources." The RFP specified the project components summarized below.

- Develop and pilot test a regional geographic program model, suitable for replication, which will augment and not duplicate existing services.
- Offer screening and evaluation referrals, assistance with locating resource for payment, and follow-up with priority given to individuals in state institutions and those for whom technology could help function independently.
- Establish communication and agreements with local and national, public and private resources.
- Use computerized databases and electronic mail.
- Maintain a used-equipment inventory.

The Grant Proposal

The Integrating Technology into Service Delivery (ITSD) Project was designed to develop and test components of a system change model. The model's purpose was to help the service delivery system use technology. The intent was to strengthen and improve the way assistive technology was used in services to individuals. The ITSD Project was not designed to replace or duplicate existing services. The project's focus was on developing tools, mechanisms, and strategies for integrating technology into existing services. In addition, it was to develop recommendations for a statewide delivery system which could continue to integrate technology into services after the ITSD Project ended. The project would develop, test, and evaluate the effects of model components on services and determine the potential for replication in other areas of Texas.

The ITSD Project would integrate technology into services by placing a "layer of information" about assistive technology "above" the existing service delivery system. The layer of information would be contained in a Bulletin Board, database, software, and workshops. As agencies "tapped into" this layer of information to help individuals, they would slowly integrate technology into their service delivery patterns. The ITSD Project would not push change or add new services, but provide the resources for agencies to change internal operations and use technological solutions to individual problems.

The initial grant application contained quantifiable results in several areas. Fifteen agencies were to be provided microcomputers and trained to participate in ITSD activities. At least 500 individuals were to be screened over a three year period using ITSD developed expert system software. Three hundred individuals would receive assessments using an assessment system for quantitative measurement of functional capacity. Four hundred and fifty persons would receive training at ITSD sponsored workshops. The electronic bulletin board would network 15 agencies the first year and many more agencies as the ITSD Project progressed.

The overall result of ITSD was to be a local community that was more supportive and aware of assistive technology. This community of providers, consumers, researchers, and the commercial sector would be supplemented by educational/assessment software, functional assessments tied to technological assistance, and an electronic network and database.

The Technology-Related Assistance Act of 1988

The model and replication strategy of this project were impacted in many ways by activities connected with the Technology-Related Assistance For Individuals with Disabilities Act of 1988 (Public Law 100-407). The State agency designated under P.L. 100-407 was the Texas Rehabilitation Commission. During the third year, the TPCDD approved workplan revisions to enable ITSD to include activities addressing the initial planning and needs assessment for the Texas P.L. 100-407 grant application. Due to Statewide planning for P.L. 100-407 and potential funding of a statewide system, the local model described in this report may serve as the basis for a coordinated statewide effort. However, the ITSD Project only researched strategies on a local level. It did not research strategies to achieve the statewide coordination and integration anticipated under P.L. 100-407.

To date (December, 1990) Texas has been unsuccessful in receiving a Federal grant under P.L. 100-407. Given the current situation, this report develops a model for replication throughout Texas on the local level, rather than a statewide model involving statewide funding, coordination and implementation. The local model would benefit from some form of statewide assistive technology effort under P.L. 100-407.

Major Project Goals, Objectives and Activities

ITSD goals and objectives are listed below. The goals and objectives represent the major efforts of the project and remained consistent for the four years of the project. The objectives changed slightly from year to year. The objectives listed have been modified to incorporate activities for all four years of the project.

Goal 1: To develop a community structure of providers, consumers, researchers, and the commercial sector which can provide input for the project, provide resources to further project goals, and use project activities to enhance services (local development).

Objective 1: To provide an ongoing forum for project committees and activities.

Objective 2: To hold five one day workshops on assistive technology for local consumers and providers for the first two years of the project and to replicate the most successful workshops statewide during the third year.

Objective 3: To publicize project activities and develop public information materials describing technology resources, e.g., newsletters, workshop information packets, and a resource directory.

Objective 4: To provide training across Texas on how to access rehabilitation technology resources.

Goal 2: Develop computer systems to aid in individual screening, assessment, and matching of technological aids.

Objective 1: To document the current procedures, rules, and expertise used by experts in DD technology and to convert this knowledge into a computerized "expert system" to screen for technology assistance and to match individuals with the most appropriate technology.

Objective 2: To make use of existing quantitative functional assessment methods being developed by the UTA Center for Advanced Rehabilitation Engineering (CARE) to obtain profiles of functional capacity.

Goal 3: Develop, maintain, and secure continuation funding for an information utility and electronic network which will provide easy access to information on DD technology and also provide the communications necessary for the coordination of technology services.

Objective 1: To create, refine and maintain an electronic mail and bulletin board system that will allow agencies to share common needs and ideas about the use of technology in service delivery.

Objective 2: To expand and combine the resource database developed under a previous grant, with the electronic network and make it easily accessible by consumers and providers.

Objective 3: Review participation and computer utilization of agencies and individuals receiving computer equipment through this project.

Goal 4:: Assist in P.L. 100-407 activities included collecting and analyzing survey results, setting up and staffing public forums across Texas, and staffing statewide planning meetings.

Methods

The major goals and objectives were achieved through the efforts listed below. These efforts may be considered "components" of the model tested by the ITSD Project. Each component and its rationale will be described in detail in the next section on project results and discussion. Component descriptions were placed in the next section to keep the discussion about each component in proximity. Project methods are:

- An electronic mail and bulletin board system (BBS).
- A resource database searchable through the BBS.
- Professional and consumer involvement individually and through committees.
- Working through local agencies.
- Equipment distribution.
  - Microcomputer purchases and training for agencies.
  - Exchange of used equipment for agencies and individuals.
- Public Awareness
  - Public relations (newsletters, media activities, and presentations).
  - Information and referral for individuals and agencies.
  - A Texas resource directory on assistive technology.
- Workshops on technology.
- Development and dissemination of training and knowledge distribution software.

The ITSD Project was developed and carried out by the following consortium.

- The University of Texas at Arlington (UTA) **Graduate School of Social Work (GSSW)** coordinated ITSD efforts and handled all activities not delegated to other organizations.
- The UTA **Department of Continuing Education** assisted the GSSW with many of the workshops.
- The UTA **Engineering Department, Center for Advanced Rehabilitation Engineering (CARE)** was responsible for software development. CARE was a national Rehabilitation Engineering Center funded by the U.S. Department of Education, National Institute of Disability Rehabilitation Research (NIDRR). CARE was funded to develop a computer automated lab system for functional assessment. This assessment focused on the quantification of sensory and motor functions of people with disabilities. CARE would determine whether their quantitative measures of functional capacity could be linked to assistive technology assessment software.
- The **Bioengineering Program of the Association for Retarded Citizens of the U.S. (National Headquarters) (ARC/US)** developed and managed the electronic bulletin board and resource database. Representatives of all organizations were involved in the initial planning of the ITSD Project.

Results & Discussion of the Model Tested

This section summarizes the major activities carried out for each ITSD component. Each component will be discussed using three subsections. The first subsection will describe the component and its rationale. The second subsection will present data and information on the results. The final subsection will discuss the results in terms of successes and failures.

The components are discussed in an order which aids comprehension, rather than in the order of importance or implementation. For example, the first component implemented by ITSD staff concerned professional and consumer involvement. However, to understand professional and consumer involvement throughout the four years of ITSD requires one to have knowledge of components such as the electronic bulletin board. The ordering below avoids having to describe components more than once and allows clustering of the discussion on each component.

The Electronic Mail and Bulletin Board System

Description and Rationale

Distributing information electronically has been a recent innovation with the establishment of large information utilities systems such as the Source, Compuserve, and Prodigy. These systems provide electronic mail (E-Mail), conferencing, and the exchange of longer files including computer programs. Conferencing is the capacity to post public messages in an environment where the system helps users browse and respond to messages by topic area. A more recent development has been the establishment of networks of small bulletin boards systems (BBSs). A BBS is a software package that allows users with a computer or a computer terminal to call a host computer and send/receive E-Mail, conference messages, and files.

A 1985 network of approximately 800 local BBSs was the system on which the grant proposed to build a local BBS for service providers and people with disabilities. The idea behind the local BBS was to provide a mechanism for agencies to share common needs and ideas about the use of technology in service delivery. For example, one of the first bulletin board message areas to be established would concern technology aids wanted and aids available. Other bulletin board message areas were to involve topics such as funding sources and new products. Funds were provided by the grant to obtain information from other electronic information services.

Results

The ITSD Project established The DD Connection BBS in the Fall of 1986. The DD Connection is currently a two telephone line bulletin board with 290 active subscribers. It contains local message areas, international conference areas, and file areas (Appendix A). It has received national recognition and is being used for national networking by the RESNA Special Interest Group on Networking, the Amputee Support Group, and the Forum for Information Networking on Disabilities (FIND), a consortium of U.S. disability information providers.

During the ITSD Project, the BBS network, of which The DD Connection was a node, grew from approximately 800 nodes to approximately 10,000 nodes. International conferences linking many of the 10,000 nodes appeared for most disability areas. BBSs subscribing to these conferences exchange users messages each day. The content of The DD Connection changed substantially throughout the ITSD Project to accommodate this growth. The DD Connection automatically networks with many other bulletin boards to obtain 13 electronic conferences relevant to people with disabilities (see the message areas designated as echo in Appendix A). For example, the "Disability Conference" area receives about 250 messages each week from all over the world. Users in the Dallas/Ft. Worth area can post a request for information to anyone using the conference area. During the early morning hours, the user's message/request would be forwarded to all BBSs that subscribe to the Disability Conference. Several hundred BBSs probably subscribe to the Disability Conference. It is impossible to know the precise number of conference subscribers, since BBSs can readily pass on new messages to any BBS requesting them. Appendix B contains DD Connection messages which illustrate the types of networking occurring on The DD Connection.

A BBS automatically logs all user activities. When terminating a session, users are asked for suggestions or comments. Additionally, software was written to electronically mail a short satisfaction survey to users every six months. Users were cooperative with these efforts to obtain evaluative information. Use of and satisfaction with The DD Connection can be summarized by the following data.

- The DD Connection receives approximately 1200 calls each month (Appendix C).
- The approximate length of each call is 13 minutes (Appendix D).
- The DD Connection has approximately 70 new callers each month (Appendix E).
- Users like the general, private, and disabilities message areas best (Appendix F).
- Users like the utilities and disabilities file areas best (Appendix G).
- Time constraints and changes in or a shortage of personnel were the two most frequent reasons for lack of continued use by agencies (Appendix H).

The power of periodic feedback on a service became obvious. Use and satisfaction data about the DD Connection, such as that in Appendices C-H, were continually used to adjust operations.

The difference between a good and an average BBS can be hours of work. Maintaining accurate information on The DD Connection requires approximately 12 hours per week (Jones, 1989, p. 16). The ARC/US developed an extensive operator's manual which is available upon request. As Appendix A indicates, volunteers with relevant expertise monitor the information on The DD Connection in a variety of areas. For example, an augmentative communication professional monitors the communications message area and an employment agency professional monitors a message area on job openings and barriers to employment.

Project staff attempted to obtain information from national DD networks, but found that they often did not have the time to monitor other networks and retrieve information appropriate for the Dallas/Ft. Worth Area. Expense was also a problem with national networks. Often trial subscriptions to the major national networks were not seen as cost-beneficial and were discontinued.

Discussion

Overall, The DD Connection can be considered a success. However, the success has not been through use of the system by agency personnel as we anticipated, but through its use by people with disabilities, their families and friends, and the public.

One difficulty in measuring success is how to count services delivered through The DD Connection. For example, should a reply to an E-Mail request be considered a service? Should each connection to the BBS be considered a service? If an individual downloads assessment or treatment software and uses it, should that be considered an assessment or treatment service? Even if these automated activities are counted as individual services, much of what occurs on a BBS cannot be tracked or monitored. Thus, it was always difficult translating DD Connection activity into traditional service categories. The success of The DD Connection, in terms of individual services, depends in part on how one counts these activities.

Networking of Agencies. As the discussion of the grant proposal pointed out, The DD Connection was to provide a mechanism to access electronic information. Use of this information by agency staff was intended to integrate technology into the existing service delivery system. While personnel in agencies need information on technology, networking via The DD Connection was the

exception, not the rule. We found about 30 agency staff who continually networked and promoted The DD Connection. However, most local agency staff did not consistently use the BBS.

We were unable to correlate any of our efforts promoting The DD Connection with increased networking. Workshops and presentations increased networking initially, but this increase quickly faded. Providing microcomputers and training to agencies was successful only in the short term. This can be seen in Appendix I which illustrates use by agencies committed to participate after receiving ITSD equipment. Our conclusion is that consistent and meaningful networking by an agency will occur only when the reward structure by funding sources and clients encourages networking. Networking at present seems to be an individual, not a routine agency activity. The DD Connection was also used to network several professional groups, for example, Collin County Mental Health Group and RESNA. However, even networking among some professional groups was limited and never met original expectations.

In an attempt to better understand the cause for this lack of professional networking, we surveyed former users. Appendix H presents the survey results which illustrate that time and workload were the major reason for not networking. Networking provides better information, but that information comes at a cost which is time. And, using The DD Connection takes time. For example, a user may need to search the messages in many areas to find an answer to their question. If that answer does not exist, they must type in their question and then connect in several days and review subsequent messages to see if their question has been answered. Given today's caseloads, time seems to be a more precious commodity for professionals than resource information.

Some users wanted The DD Connection to implement a mail checking feature that upon connection presented a list of mail addressed to them. This feature was implemented initially. We disabled it because users connected only to check their mail. If no mail existed, they immediately terminated the session. Thus, having the mail checking feature allowed users to receive information without giving information. We felt that users must make some effort to look at the information requests of others so they would be tempted to answer them if they had the expertise. Perhaps with a large user base, such as with a statewide system, the number of users and BBS staff providing information would be large enough to allow some users to be primarily receivers.

A final factor hindering use by most agencies is that BBS use requires a change in traditional ways of gathering information. For example, many agency staff did not have a computer on their desk

and information requests for The DD Connection had to be channeled through another staff person. Almost all of our consistent professional users had their own computer for networking. Even with individual computers available, changes in information acquisition patterns take time to become part of agency operations. Exposing professionals to networking throughout their education is one important step in this change process.

Networking of Individuals. Consumer networking became the foundation of The DD Connection and made it a success. Consumers networked with each other and with professionals. The DD Connection was used for networking by several consumer groups, such as a very active national Amputee Support Group. Many consumers used the network for disability-related news and to communicate with friends. We even had consumers apologizing because they felt they used The DD Connection too much. Especially useful to consumers were the specialty conferencing areas where they could post questions about a subject and receive replies.

Volunteers help illustrate this interest by consumers. We always had ample volunteers to monitor our conference areas. In fact, some consumers noted a conference area was being neglected and volunteered to take it over without being solicited. We also had consumers wanting better features and pushing us to upgrade with better information. Consumers also supplied much of the information on The DD Connection.

Other DD Connection Activities. A DD Connection message area on used equipment was very useful in obtaining equipment donations. For example, one request resulted in the donation of about 30 usable computer terminals which were distributed. However, only several used assistive devices were donated or posted for sale.

The DD Connection offered an excellent medium for ITSD staff communications. Most ITSD staff continually exchanged messages and files throughout the project. However, as with agency networking, some who were involved with ITSD rarely networked. Some of our software developers rarely used The DD Connection. What makes some people use electronic networks deserves further research.

Resource Database Searchable through the BBS

Description and Rationale

Databases provide ways to store, update and access information easily. A database developed under a 1985/86 TPCDD grant resided at the ARC/US. The ITSD Project was to research ways to collect new information, make the database accessible electronically, update existing database information, and to monitor database use. The ITSD Project expanded the type and volume of information contained in the existing database and made the database available electronically through The DD Connection BBS.

Results

Beginning in January, 1987, those connecting to The DD Connection could access the DDTL (Developmental Disability Technology Library). The DDTL contains records on publications, vendors and agencies. The publications database and the resources database each contain approximately 3000 entries. All resources and their codes have been verified through a questionnaire mailed to the resources.

Access to DDTL publications and resources was provided by city, state, or subject keyword. Access by subject keyword is accomplished by navigating thought a tiered list of keywords and selecting those keywords desired in a search. Database searching runs independent of current user activity and search results are stored in a file area of The DD Connection. The results can be viewed on-line or downloaded to the user's computer.

A computer program to tally DDTL use was developed in 1990 (Appendix J). An analysis of the available 1990 DDTL user logs indicates that an average of 1.6 searches of the DDTL were conducted each day. Also, an average of 48 persons connected to the DDTL monthly and conducted an average of 49 searches of the database. During months with many "new users" of The DD Connection, connections to the DDTL were high, but the average number of searches per DDTL connection was lowest (.88). During months of low "new user" activity, searchers per DDTL connection averaged 2.3.

It is estimated that 30 hours each week are needed to update and add new information to the DDTL. Included in this 30 hours are searches of the DDTL in reply to written and telephone requests for information.

Discussion

Projecting from 1990 use data, we can estimate that 588 searches of the DDTL are conducted yearly. Without further refinements to the DDTL search logs and the log analysis programs, it is difficult to say what type of user was conducting the search, what information was searched for, or the number of resources found during each search. Comments from DDTL users are sent electronically to the system operator. After the initial DDTL bugs, or performance glitches, were fixed, the major comments concerned minor problems and modifications outside the scope of the project.

Developing the DDTL was more complicated than anticipated. One problem was finding a programmer who knew how to connect several pieces of independent software, i.e., multitasking Desqview, R:BASE database, and OPUS BBS. Another problem was tracking down elusive bugs. Hardware vendors often said the bugs were caused by software and vice versa. Running a multi-telephone line BBS with a large searchable database was on the cutting edge of technology. Solutions to some problems required expensive hardware modifications or software programming.

The DDTL has benefits other than on-line searches. ARC/US staff frequently search the DDTL to reply to telephone and mail information requests. DDTL resources are the basis of the Assistive Technology Resource Directory which was frequently requested (see the subsequent section). The DDTL simplified periodic updates to the database by printing mailing labels along with current user entries.

In essence, the need of assistive technology projects to provide I&R and print a resource directory are made simpler by a database such as the DDTL. Having the resource database online for user searches adds another dimension to I&R. This dimension not only saves staff time, but it also empowers many users to take resource acquisition into their own hands and to customize searches based on previous search results.

Professional and Consumer Involvement

Description and Rationale

The involvement of all segments of the community in the ITSD Project was a major objective. Formal involvement consisted of state and local committees. Informal involvement consisted of volunteers and others who participated in various ITSD activities.

The grant proposed a statewide steering committee, a local coordinating committee, and a community advisory committee with three subcommittees. The three subcommittees were composed of (1) service providers and consumers, (2) the commercial sector, and (3) researchers/experts. The details of the Statewide Steering Committee were stipulated in the RFP. The Community Advisory Committee was to contain the key organizations involved in the project. The Consumer/Provider Subcommittee would monitor the services provided throughout the project and identify gaps in services and problems. The Commercial Sector Subcommittee would establish ways in which the commercial sector could be involved in developing technology and supporting the use of technology in service delivery. The Researchers/Experts Subcommittee would provide technical expertise to ITSD.

Involvement was considered necessary because people are more committed to changes if they have input into and control over those changes. Also, ITSD activities were time limited and the responsibility for continuing ITSD activities would fall on the local community.

Results

Involvement Through State and Local Committees. The Statewide Steering Committee met three times the first year but was disbanded for reasons presented in the discussion subsection below. The ITSD coordinating committee was combined with the community advisory committee and met almost quarterly throughout the project (22 times). The three subcommittees, composed of (1) service providers and consumers, (2) the commercial sector, and (3) researchers/experts met a total of 19 times the first year before being disbanded for reasons listed in the discussion subsection below.

Formal Involvement of Industry One target group for formal involvement in the ITSD Project was industry. ITSD was unsuccessful in contractually or financially involving local industries, such as IBM, GTE, Tandy, Apple, etc. A formal proposal was submitted to IBM for computer equipment to be distributed to consumers and negotiations were conducted with MCI concerning their sponsorship and donation of an 800 toll free telephone number for The DD Connection. Neither effort was successful.

Volunteer Involvement by Professionals and Consumers. Informal involvement in ITSD outside the committee structure was high. Volunteers provided a variety of services including consumer training, programming, BBS monitoring, and equipment repair. Table 1 presents data on three types of volunteers and their involvement.

Table 1

Volunteer type	Number of Volunteers	Volunteer Hours
DDC volunteers	Approximately 20	Approximately 1000/year
Trainers on computer use	14	Approximately 200/project
Equipment repair volunteers	4	Approximately 96/project

ITSD worked informally with individuals from many industries. For example, ITSD worked with the Volunteers in Mechanical Engineering group originating from General Dynamics. ITSD assisted them in finding technology projects and exploring cooperative links with residential facilities operated by The Texas Department of Mental Health and Mental Retardation.

Discussion

Involvement through State and Local Committees. The committee structure proved to be too cumbersome to maintain. After several statewide steering committee meetings, the TPCDD and ITSD staff felt that the benefits had begun to diminish. Expertise was more easily obtained on an as-needed basis. Since the ITSD Project was a local effort, the statewide steering committee had less relevance than had been anticipated.

The local ITSD coordinating committee met throughout the project and provided valuable input on ITSD activities. The three subcommittees never proved to be of major benefit. They were designed to provide policy and guidance rather than to perform specific tasks. However, it soon became apparent that the experts and influential committee members had little time. Continuity in attendance was a problem due to members traveling and previous commitments. In addition, members were more interested in helping out with specific activities than with helping design, set policy for, and carry out a model project. Given this lack of continuity and interest, subcommittees were discontinued during the first year.

Formal Involvement of Industry We were unable to develop written agreements with industry to provide employee time, equipment, funds, or other resources for ITSD activities. Though it proved impossible for one small, time-limited project to cultivate formal agreements with major industries, a coordinated statewide approach may offer potential. One example of a successful national coordinated industry involvement is The CompuMentor Project in San Francisco which has matched approximately 200 industry computer experts with one of 125 nonprofit organizations that needed their

skills (For a startup kit, write CompuMentor, see reference list). Another is the National Cristina Foundation which solicits and distributes used equipment from major U.S. corporations (see reference list for address). The Texas Rehabilitation Commission is currently working with the National Cristina Foundation. To formally involve industry statewide, the TPCDD might issue a Request for Proposals seeking projects which involved industry with assistive technology services. Funding could then be given to projects with potential to formally link industry with assistive technology services statewide.

Volunteer Involvement by Professionals and Consumers. Overall involvement by professionals and consumers in ITSD activities was high and sometimes overwhelming. Our volunteer effort was not as formal as it could have been, yet we accomplished a lot with volunteers. Everyone became a volunteer coordinator at times, due to the varied nature of the volunteer effort. However, to maintain consistent volunteer involvement, a volunteer coordinator is needed. For example, often a volunteer was willing to do tasks, such as computer programming, which could involve several ITSD activities. Checking out this volunteer's interests, abilities, availability, etc. and matching them with potential tasks involved time and follow-up. Since no one was responsible for all volunteer activities, the volunteer was often not used to their potential.

We believe volunteer expertise and time commitments are a valuable resource to local technology projects. Future efforts should provide systematic and coordinated pre-planning and a volunteer coordinator to optimize the benefits of using volunteers.

Working through local agencies

Description and Rationale

Local agency involvement and empowerment were seen as vital, because ITSD was designed to produce system change and successful ITSD activities were intended to be continued by local agencies. The ITSD grant proposal predicted that it would be difficult for a time-limited project to promote and sustain system change without working through local agencies. Agencies have little incentive to change. Before agencies will change, the benefits of the change must be shown to offset the immediate and long term cost of the change. Agencies would rarely accept short term gain that may cause long term problems.

Working through local agencies was also important for the continuation of ITSD's activities. ITSD was to be carried out by a small group working to enhance the activities of other agencies. Since

ITSD was time-limited and university based, we sought to have individual ITSD components housed in agencies which had that component as part of its mission. Thus, a new agency was not needed and ITSD components would have a better chance of continuing after the grant ended.

One factor favoring system change through local agencies is that the area of technology is new and overlapping services were not seen as a problem. In addition, agencies felt the need to make changes so they could incorporate technology into their services. The concept of ITSD was to empower agencies to change in the direction in which they desired. The agencies involved in ITSD were the Bioengineering Department of the Association for Retarded Citizens of the U.S. (National Headquarters), the Dallas Center for Independent Living, and a local agency called C—CAD (Center for Computer Assistance to the Disabled).

Results

The ARC/US was significantly involved throughout the ITSD Project since it housed the electronic network and database. The Dallas Center for Independent Living was involved by providing access to the consumer/provider community, especially agencies concerned with helping individuals achieve independent functioning. Project staff were initially located in a local nonprofit agency called C—CAD (Center for Computer Assistance to the Disabled). C—CAD finds computers, assistive devices, training, and information for people with disabilities. C—CAD was located in the same building as the ARC/US. C—CAD was a small, new agency which felt a loss of identity as the ITSD Project staff and activities grew larger than those of C—CAD. After approximately one year at C—CAD, the project moved to offices at the UTA Graduate School of Social Work. Agency involvement with ITSD centered around training workshops, the electronic network, software testing, grant writing and planning for project continuation.

Since ITSD was a neutral entity, it was able to act as a catalyst and convener on technology related issues. Many ideas involving technology were examined with local agencies. During the four years of ITSD, five grants were written for an assistive technology center, two for a job bank, four for C—CAD activities such as work site modification, and one for a local Apple Computer Group.

Discussion

Given the number of people involved in The ITSD Project, staff training was a problem because it was time consuming. Project staff needed to be knowledgeable about various types of software such

as spreadsheets, word processing, desktop publishing, database, communications, BBS, authoring systems, demo-makers, etc. They also needed clinical, administrative, and public relations experience. Professionals with these experiences are rare in the field of disabilities. Since knowledge of the disabilities field was essential, ITSD staff were hired because of their disabilities experience and interest in assistive technology. However, this lack of technology and software skills required additional learning throughout ITSD, especially given the complexity of the software and the many different people and agencies involved in ITSD. Hardware and software training and software upgrades for staff should have been budgeted and part of the initial workplan.

While the involvement of other organizations was a major strength, it was also a major weakness. It complicated the management of ITSD, especially in controlling deliverables from other organizations. Subcontracts with other organizations made it difficult to fine tune financial incentives, because budget revisions and state approvals were required when original budget projections changed. For example, when timeframes lagged on one software project, it was difficult to use financial incentives to rectify the situation. Modifying the payment schedule would have required a budget revision. Then, going back to the original payment schedule would have required another budget revision.

The ITSD Project overestimated the willingness of agencies to become involved in ITSD and to change. Agencies have few resources to devote to change. Survival and the provision of primary services are the major agency priorities. Devotion of time and other resources to networking, software use, and training is difficult for agencies to justify and is often considered a distraction from a worker's already busy schedule.

Working in cooperation with other agencies helped ITSD activities continue. The DD Connection and DDTL are currently operated by the ARC/US. Other components of the project are being merged into a Computer-Assisted Technology Services (CATS) program at the Ft. Worth Easter Seal Society. Project activities to be continued through the CATS program include: assessment, training, and loaning of equipment to people with disabilities. Assessment for assistive technology will be expanded by a team of trained CATS therapists. CATS training will involve individual training and workshops for professionals. A currently operating equipment loan program at Easter Seals will be expanded to include computers and assistive technology. The CATS program will also continue project efforts in data collection for individuals with disabilities, e.g., the resource directory.

Equipment Distribution

Description and Rationale

Equipment distribution would occur through microcomputer purchases and training for agencies and through the exchange of used equipment for agencies and individuals. Microcomputers were seen as an incentive to get agencies to participate in ITSD activities. Microcomputers were to be granted upon a formal agreement by agencies to participate in ITSD activities such as The DD Connection. Since grant funds could not finance hardware for individuals, mechanisms to find and distribute used equipment and technological aids were to be explored.

Results

Microcomputer Purchases and Training for Agencies. Nineteen microcomputers were purchased for distribution to agencies. Some microcomputers moved from one agency to another as individual agencies discontinued their involvement due to time constraints and personnel changes. Twenty-four different agencies received microcomputers throughout the ITSD Project.

Exchange of Used Equipment for Agencies and Individuals. ITSD also received donated equipment for agencies and individuals. Appendix K contains the list of donated equipment. Donated equipment was checked out and distributed by volunteers and staff. Unusable donated equipment was exchanged at a local computer flea market for needed parts.

Discussion

Microcomputer Purchases and Training for Agencies. All agencies welcomed microcomputers. We continually had a waiting list. However, many agencies saw microcomputers primarily as management tools and not as tools for networking and resource acquisition. For example, agency managers were more interested in getting hardware and information on how their agency could use technology to support agency management than how their clients could use technology for employability and independent living. We found our services being requested more for the former than the latter. Possibly, agency management technology needs must be satisfied before managers become interested in using technology to benefit workers and clients. If an agency has its own technology needs met, then it may have more expertise to consider technology for others.

Agencies receiving the ITSD computer as their first computer often needed more training than ITSD staff was capable of providing. The assumption that agencies would take the initiative to learn on their own was not valid in about half of the cases. At the end of the second year, we considered requesting staff who could provide expert technical assistance to agencies and individuals. However, ITSD did not want to develop a training effort which we could not sustain for more than one year. However, the need for someone to provide technical assistance to agencies is very great.

Agency internal telephone systems were a constant problem. Some were so problematic that they could not accommodate a computer and modem. One was of such poor quality that human voices often came from the modem. We could rarely anticipate those problems, and sometimes many visits were necessary to debug and get the equipment working. Often, the only solution was to install a telephone line dedicated to the modem. This was an expense not originally anticipated.

Agency staff turnover was also a problem. We often provided equipment to an agency staff member who understood computers and networking and was eager to participate with ITSD. However, within several months, this interested person had either left the agency or moved into a different agency program. The agency's involvement at that point would often cease. We then had to provide many hours of additional training to allow the agency to continue to participate. Often when the interested person moved, ITSD activities were delegated to another person so that the agency could justify continued use of the computer equipment. However, without the commitment to ITSD, participation by that agency eventually faltered.

It was difficult to remove computers and other equipment from agencies, even when agencies did not use them for project purposes. Agency participation would lapse. We would notify the agency that the equipment would be removed unless they met the networking requirements. Then, agencies would connect to meet requirements, yet eventually lapse again. This cycle was repeated continually with many of the agencies.

Exchange of Used Equipment for Agencies and Individuals. Much used computer equipment exists. However, used computer equipment should be accepted with care. Some people donated boxes of used equipment from their garage. One business donated about 30 computer terminals. We received one call from a local college to pick up a large minicomputer previously used for college registration. Much of this donated equipment was unsuitable for a human service agency.

Agencies, unsophisticated in hardware, are often better off buying new equipment if it comes with the technical support needed to get it up and running.

Checking out the used equipment proved a formidable task. Each system operated differently and the software and manuals were often not included with the donation. Luckily, we recruited a volunteer who loved to tinker with old equipment. We also had access to a local computer flea market which provided a mechanism for trading unwanted parts for needed parts. However, when the volunteer moved out of state, we had a major problem finding a replacement to evaluate donated equipment.

We found many consumers with available time, so giving donated equipment to consumers can be more practical than giving it to agencies. Much of the donated equipment placed with consumers was older and had limited use except for networking via BBSs. Consumers had difficulty learning to use computer equipment. While consumers were always pro-technology, many did not continually connect to the BBS even after receiving extensive training. Many factors complicated consumer training. For example, after about seven training efforts, we finally concluded that one consumer with whom we placed equipment could not read at an acceptable level. Due to pride, he blamed his failure to use the equipment on factors like fatigue and loss of instructions. Another consumer continued to call for training although he appeared adept at using the computer system. We concluded that his continued calling was to combat loneliness.

To avoid many of the problems with used equipment, we tried to act as a broker of used equipment. This avoided physically collecting and storing the equipment and helped connect the donor and receiver for technical support.

Collecting used assistive technology devices was not successful during the ITSD Project, because few used devices were available. However, the number of donated used devices is expected to increase with the projected increases in overall device sales, and donations can make used devices an important resource. The used equipment area of The DD Connection functioned well to collect and distribute the approximately 5 used devices that became available.

Public Awareness

Description and Rationale

The value of traditional public awareness activities to generate support and interest was to be investigated. Public awareness activities included media activities, presentations, a newsletter, and a

resource directory. In addition, information and referral for individuals and agencies was to be a major ITSD activity.

A statewide conference was to be held in the final year of the ITSD Project. The conference would present the software, networking, and training which occurred during this and other projects along with the strategies that communities could follow to implement similar changes. Technical assistance to other areas of Texas desiring to follow the model would also be provided during the final year.

Results

Public Relations and Information Dissemination. Public relations and media work was not emphasized, since ITSD focused on providers and not the public. ITSD staff produced two issues of its newsletter and were involved in many media activities. Approximately 1500 ITSD brochures were distributed. Public awareness was helped by the large number of agencies and individuals involved in ITSD. Statewide conferences were considered an inexpensive way to make connections with Texas professionals. Staff attended many Texas disability related conferences and undertook 127 conference presentations/exhibits over the four year period.

Information and Referral for Individual and Agencies. Information and referral for individuals and agencies seeking assistive technology assistance was a major activity for ITSD. More than 1,191 officially recorded requests for information were handled during the four years of ITSD. Most concerned how to locate and fund available technology. A typical request was from a mother wanting to know if technology could help her child compensate for a disability. Staff received visitors and correspondence from as far away as Europe, South Africa and Australia.

A Texas resource directory on assistive technology. In the final year, a 140 page, 291 entry Texas Resource Directory on Assistive Technology was developed. An initial printing of 1000 was quickly exhausted and a second printing of 1000 was distributed. Requests came from all over the U.S. as information about the directory became available in professional newsletters.

Discussion

Public Relations and Information Dissemination. As with all service activities, positive media is desirable. Assistive technology is a topic that captures public interest and concern (for an

example, see Appendix L). A well concerted media effort on the part of future assistive technology projects will probably be well received. Positive media spreads the word about assistive technology and advances the knowledge of consumers, their friends, and their relatives.

In the first year of the grant, other activities took precedence as the project tried to develop an identity and track record. In the final stages, the project was terminating so media attention on ITSD was not as desirable as attention on individual agencies. The exposure for ITSD has been good nationally and additional local print media, radio and TV coverage could have been available. However, with local service providers experiencing an overload of clients and a shortage of funding for devices, evaluations, and training, it was not desirable to launch a publicity campaign about the potentials of assistive technology.

Conferences were an easy and inexpensive way to reach professionals. Having key personnel at an attractive information booth in an exhibit area with free handouts was a good way to contact the provider community.

Information and Referral for Individuals and Agencies. The majority of requests for information and referral were from individuals with disabilities on device recommendations and funding sources. Both consumers and agencies complained about a lack of knowledgeable professionals and funding with no coordinated mechanism for obtaining information. They spent too much time calling too many people with few tangible results. These complaints reflect the plight of consumers across the U.S.

A Texas Resource Directory on Assistive Technology. Although information in the directory was available electronically in the DDTL database, the printed directory was well received and highly requested. Obtaining the information in the directory was difficult and time consuming. It took several mailings of a survey and repeated follow-up telephone calls.

Workshops on Technology

Description and Rationale

Provider and consumer training was seen as a major ITSD component. Five day long workshops were planned for each project year. Each workshop would feature hands-on demonstrations for

approximately 30 providers and consumers. A packet of materials summarizing each workshop's contents and resources would be available statewide.

Results

Over a two year period, ITSD held 9 local workshops on topics ranging from funding of devices to the latest theories of human performance measurement (Appendix M). Many workshops focused on devices for a particular client group, for example, communication devices. Other workshops featured a company's product line, for example, Prentke Romich. Conference materials were made available to the public and more than 150 packets were distributed. Three popular workshops were repeated in different parts of Texas.

Total attendance at all workshops was 437 with an average attendance at 36. The 437 attendees is very close to the 450 projected in the original grant application. The workshops were well received as indicated by high scores on the workshop evaluation question "Was the workshop personally, professionally and scientifically significant." Attendees gave an overall rating of 4.1 on a 1-5 scale where 1 = strongly disagree and 5 = strongly agree.

Discussion

Given the rapid emergence of the field of rehabilitation technology, professionals often have not had the course work or training necessary to recommend assistive technology for individuals or to discuss the advantages of assistive technology with employers. Training on assistive technology has repeatedly been identified as a high priority need by national, state and local studies. Training was a very successful component of ITSD. It was an inexpensive component as vendors are eager to address audiences and audiences are eager to hear vendors. Local workshops are viable, because they require little time and travel money for agencies. Small workshops permit more hands-on experiences for those in attendance.

Software Development

Description and Rationale

Software for information dissemination, training and assessment was seen as one way to expand services with limited resources. ITSD was to explore the use of existing software for individual screening,

assessment, and matching. ITSD was also to explore the development and use of microcomputer-based screening and technology matching software based on expert systems tools.

Expert systems are computer software programs which use knowledge, such as decision rules, to mimic the decision processes of experts. To develop the expert system, key experts in a field of technology would be interviewed for their decision rules. Then, the rules and methods to extract decisions from the rules would be programmed into software. The decisions of the expert system would then be compared with the decisions of existing experts to determine the accuracy of the system developed and where corrections were needed. The expert systems developed would give service providers predictions of success, suggestions for appropriate technology, costs, and detailed follow-up information, such as appropriate literature or references. The estimated cost for each package was to be about $10,000. The packages were to be in areas such as augmentative communication, environmental controls, mobility, and independent living.

One local measurement system would be evaluated for use by service providers. This was the quantitative functional assessment methods under development by the U. of Texas at Arlington, Center for Advanced Rehabilitation Engineering (CARE). CARE measures consist of quantitative assessments of upper and lower extremity strength, speed, coordination, range of motion, reactions, and sensations at various body sites. Additional assessments were made of hand/arm tremor, body stability, mental status, and activities of daily living. Those tested performed simple tasks involving skills such as eye-hand coordination and balance. Two hundred different measures of function were available on each person tested. ITSD was to obtain a profile of an individual's functional capacity and to use the profile to help determine the appropriate technological aid. Data obtained from this matching would be used to develop a statistical model for predicting outcomes based on functional profiles and other demographic information. The statistical model would be incorporated into the expert systems developed to allow more accurate prediction of success and selection of technology for the populations selected. Consistent with the initial RFP, individuals in institutions and those currently unserved in the community will be given first priority for CARE evaluations.

All software products developed would be refined and transferred to private software companies which could advertise their availability, continue to refine their capabilities, and provide user support.

Results

Three MS-DOS compatible software products were completed through ITSD. One package was an overview disk presenting the ITSD Project. The second was a disk which demonstrated The DD Connection and the DDTL and provided training on its use. The third was a knowledge distribution (expert system) software package called AUGMENT which provided screening, assessment, remedial work, and resources to professionals, parents, or individuals considering an augmentative communication device. Each software package and the functional assessment will be discussed separately.

ITSD Overview Disk. The ITSD Overview Disk was developed using a presentation software package called Instant Replay. It cost under $2000 to produce and about 25 cents per copy to distribute. More than 1,148 copies of the ITSD Overview Disk were distributed. The disk presents major ITSD Project components, the activities for each component, and the results anticipated and achieved.

The DD Connection Training Disk. The DD Connection Trainer contained The DD Connection BBS and the DDTL. Most messages, files, and DDTL database entries were deleted to allow the demo to fit on one 5 1/4 inch floppy disk. More than 1000 copies of The DD Connection Trainer were distributed. A cassette tape and written narrative were developed to accompany The DD Connection Trainer. One hundred copies of the cassette were made and 96 distributed.

Knowledge Distribution Software. Originally, the ITSD Project was to develop 3-5 software packages to provide information and expert advice. AUGMENT was the first package. It covered the subject of augmentative communication and was developed for the $10,000 budgeted. Throughout the project, we distributed 1,151 copies of AUGMENT and copying and distribution were encouraged. AUGMENT was also available for downloading from The DD Connection. AUGMENT will continue to be distributed through electronic bulletin boards and through the Computer Use in Social Services Network (CUSSN)Software Copy Service. We have no way of knowing how many copies have actually been made or how many individuals were actually screened using AUGMENT.

Due to reasons discussed below, the remaining software packages were not developed. Instead, a second knowledge distribution software package, called SMART (Software Module for Advice in Rehabilitation Technology) was planned and partially developed. It was designed to be a shell which could easily store expertise in any content area. However, SMART never reached the distribution status due to lack of completion on the part of the software developer.

Functional Assessment. Project staff and 24 individuals with developmental disabilities were screened using the CARE developed functional assessment. Some individuals, especially those from state institutions, had functional limitations which prevented them from being able to perform several key tasks and tests designed for the general population. While the functional assessment was thorough, the results were too complex to use by agency staff given the measurement problems and the scarcity of services and assistive technology. The possibility of tying the functional assessment results to screening software was also explored. Several screening software vendors and venture capital firms were contacted. However, the additional developments required of the functional assessment and the screening software make the tie between the products unfeasible at the present time.

Discussion

ITSD Overview Disk. The ITSD demo was successful in educating consumers and providers about ITSD and in showing how to use technology to disseminate information. It was very useful in attracting attention and promoting discussion at our booth at conferences. Current advancements in demo and hypertext software would make the development of the disk easier and less expensive. Using these new tools, a staff member familiar with computers could develop a similar disk. A programmer would not be required.

The DD Connection Training Disk. The DD Connection Trainer was successful in two ways. First, it helped users learn about The DD Connection and how to use it. Since it could be used without actually connecting to The DD Connection, interested persons could experience The DD Connection before investing in a modem. They could also practice using The DD Connection before calling The DD Connection long distance. Second, the DD Connection Trainer was very useful for conference and workshop presentations about The DD Connection/DDTL as it mimicked a session. It was eagerly sought after along with ITSD literature at conferences. Thus, it proved a very effective in educating potential users and in decreasing fears about telecommunications.

Knowledge Distribution Software. The knowledge distribution software was not as successful as originally planned. Major difficulties concerned conceptual design, theoretical design, use, and development. These areas will be illustrated by a discussion of AUGMENT.

The original concept behind AUGMENT was to provide assessment and device recommendations. However, it soon became apparent that this expertise was very complex, constantly changing and

beyond the capacity of ITSD staff to computerize. Also, commercial vendors were attempting to develop such products. We decided not to begin with complex screening software, because teachers, professionals, parents, and clients first needed pre-screening information. Pre-screening software would present information similar to that requested during a telephone call to an appropriate expert. Given this need, the focus of AUGMENT changed from detailed assessment and devices recommendations to pre-screening, remedial exercises, and information dissemination. One could philosophically categorize the change as moving from an "expert system" to a "novice system."

The expensive expert system shell being considered was not purchased and AUGMENT was written in the QUICK BASIC computer language. QUICK BASIC is structured and uses hypertext concepts. An important feature of QUICK BASIC is that it will run on any microcomputer without requiring additional software from the user. Most expert system shells require the user to purchase an expensive version of the expert system. We felt that the focus and programming language used to develop AUGMENT were correct.

The theoretical base needed to perform appropriate assessments was an unresolved issue for AUGMENT. We chose the most respected expert in our geographic area. However, we discovered that disagreement existed among experts within the field on what approach should be taken with individuals with disabilities. Some professionals who evaluated AUGMENT disagreed with the approach taken by AUGMENT. Concern was expressed that novices and consumers using the software might not understand that the philosophical approach AUGMENT took was open to debate. This disagreement should be expected in any new field and its resolution will unfold as the field matures.

An example will illustrate this lack of agreement. One module of AUGMENT provided screening and scored the individual on the potential to benefit from an augmentative communication device. After the screening module was developed, the trend in the field moved from screening to considering all clients as potentially capable of using technology. The concept of "screening out" was replaced with the concept of "zero rejection rate." While the newer philosophy was incorporated into AUGMENT, it retained the flavor of the older philosophy and appeared outdated to some professionals.

This lack of theoretical agreement among professionals hindered our evaluation of AUGMENT. We sent AUGMENT to many professionals who agreed to give feedback. However, even with repeated telephone calls, few provided feedback and none provided written feedback which they would allow to be shown to the expert who guided its development. So, we added an automatic evaluation

instrument which printed an evaluative report with our return address, but no evaluations were returned. We received comments periodically about AUGMENT being useful, but we have no hard data to support its use.

Using the AUGMENT approach, substantial programming would be required for each new software package developed. To avoid this inefficiency and to shorten the development time for new packages, we began by developing a matrix software "shell" which could be easily loaded with expertise on any topic by using word processing software. The shell was developed, but not with the sophistication and capacity that was desired. The effort became less important as other similar shells (decision trees and hypertext) appeared on the market. However, these other shells were not formally evaluated.

The final set of problems concerned the software development process. Software development in which the end product is not rigidly specified can be a bottomless pit and quickly absorb all the time and funds allotted to it. This creates problems for the developer and for those contracting for the finished product. The developer often feels that the sponsor always wants a few more minor changes. These minor changes can require major system redesign. The sponsor often feels that the developer will never finish until the money is cut off.

Developing software products is difficult within the traditional grant structure due to the lack of control over product specifications, deadlines, and funds. Also, academic institutions and staff are more suitable for experimentation rather than production. We concluded that software which focus on innovative software designs and their utility can be developed best through grants to academic institutions. Software where the design and product are well specified can be developed best by contracts with vendors. Contracts with vendors should allow for frequent feedback and decision points where all renegotiate proceeding or termination. Whoever is the developer, the final software should be designed to allow for small changes and additions to be made by agency staff.

Functional Assessment. While agencies were initially very enthusiastic about using the functional assessment, few could translate the detailed results into treatment plans. Tying the functional assessment measures to assistive technology capacities would be an extensive project beyond the scope of the ITSD activities. Given the rapidly changing nature of assistive technology, it would be difficult to evaluate each new device to determine which functional assessment measures reliably predicted satisfactory device use. It appears that functional assessment is an area which has potential only after more research is completed.

Other Project Activities and Promising Strategies not Evaluated Fully

This section discusses ITSD activities which were not part of the model tested, for example, P.L. 100-407 activities. It also discusses activities which were relevant to the model tested, but which were not evaluated fully to arrive at specific conclusions, for example, involvement of local computer clubs.

Involvement in P.L. 100-407 activities

ITSD was extended during the 1988-89 year to help Texas with activities involving P.L. 100-407, the Technology-Related Assistance For Individuals with Disabilities Act of 1988. Staff helped conduct and analyze a statewide needs assessment survey and coordinated seven public forums around the state. Staff complied information from the survey and forums into a statewide needs assessment report. Staff also helped with local and statewide steering committee meetings. One indicator of the success of ITSD is that the DFW area was very active in P.L. 100-407 planning activities. This can be credited to increased public awareness about assistive technology and open channels of communication about 100-407 activities.

Relevant information from P.L. 100-407 activities include the needs assessment. Two needs documents are included in the appendix. Appendix N lists state needs and priorities from various sources. Appendix O presents the prioritized needs adopted by the Statewide Steering Committee appointed by the Texas Rehabilitation Commission to produce the P.L. 100-407 grant application.

Texas has been unsuccessful in receiving a P.L. 100-407 grant and is currently developing its grant application for consideration in the third round of funding. Many statewide projects recommended in this report could be performed in conjunction with P.L. 100-407 activities.

Involvement of local computer clubs

Local computer clubs have a wealth of resources which might be provided to an assistive technology project through formal arrangements. However, computer clubs are often informal organizations which are incapable of commitments on other than an unofficial and individual basis. We received many computer club volunteers via The DD Connection, but a formal effort was not made to involve computer clubs. The following activities might be conducted to determine if computer clubs could be involved in a more formal way.

- Identify club leaders in a local computer newsletter or from a computer store.

- Send a letter requesting help and follow the letter with a telephone call.
- Have several specific, well defined ideas of how the club could be involved, e.g., training, system repair, device design and development. These projects should have potential as public service or public relations for the clubs.
- Make presentations at computer club meetings.
- Negotiate ways to formally or informally involve the club.
- Set up a database with information on computer clubs and their volunteers. Be prepared for high turnover of club leaders and volunteers. Perhaps consider the first computer club project to set up volunteer management software to help manage this type of effort.

Involvement of Volunteer Groups

ITSD did not seek formal agreements with technically-oriented volunteer groups such as VME (Volunteers in Mechanical Engineering) or the Bell Volunteers. These groups can offer valuable expertise on projects and take on new engineering projects. One reason for not involving these groups formally is that the ITSD Project worked with C—CAD which is closely tied to the professional volunteer community. An assistive technology project not connected with an organization such as C—CAD should make an effort to have formal, written projects with volunteer groups.

A LATSN Model for Integrating Technology into Services

This section unites what was learned from testing model components during the ITSD Project. Successes and potentials are united into a recommended local model service delivery called, for lack of a better name, a Local Assistive Technology Services Network (LATSN). Assistive technology is defined in P.L. 100-407 as "any item, equipment or product system that increases, maintains or improves the individual's functional capabilities." The term "system" implies a group of entities working together with logical and coordinated entry and exit points and evaluative data channeled through feedback loops to insure that entities meets common goals. The term "network" implies core services or a hub which is well connected to surrounding services.

Description of the LATSN model

ITSD helped define LATSN services and how those services could be arranged. A LATSN is not a single organization. It is a network of entities which agree to formally coordinate services within a community. The term entities is preferred to the term organization, because some services might be provided by volunteer associations or individuals. The services of a LATSN could be categorized under the following categories:

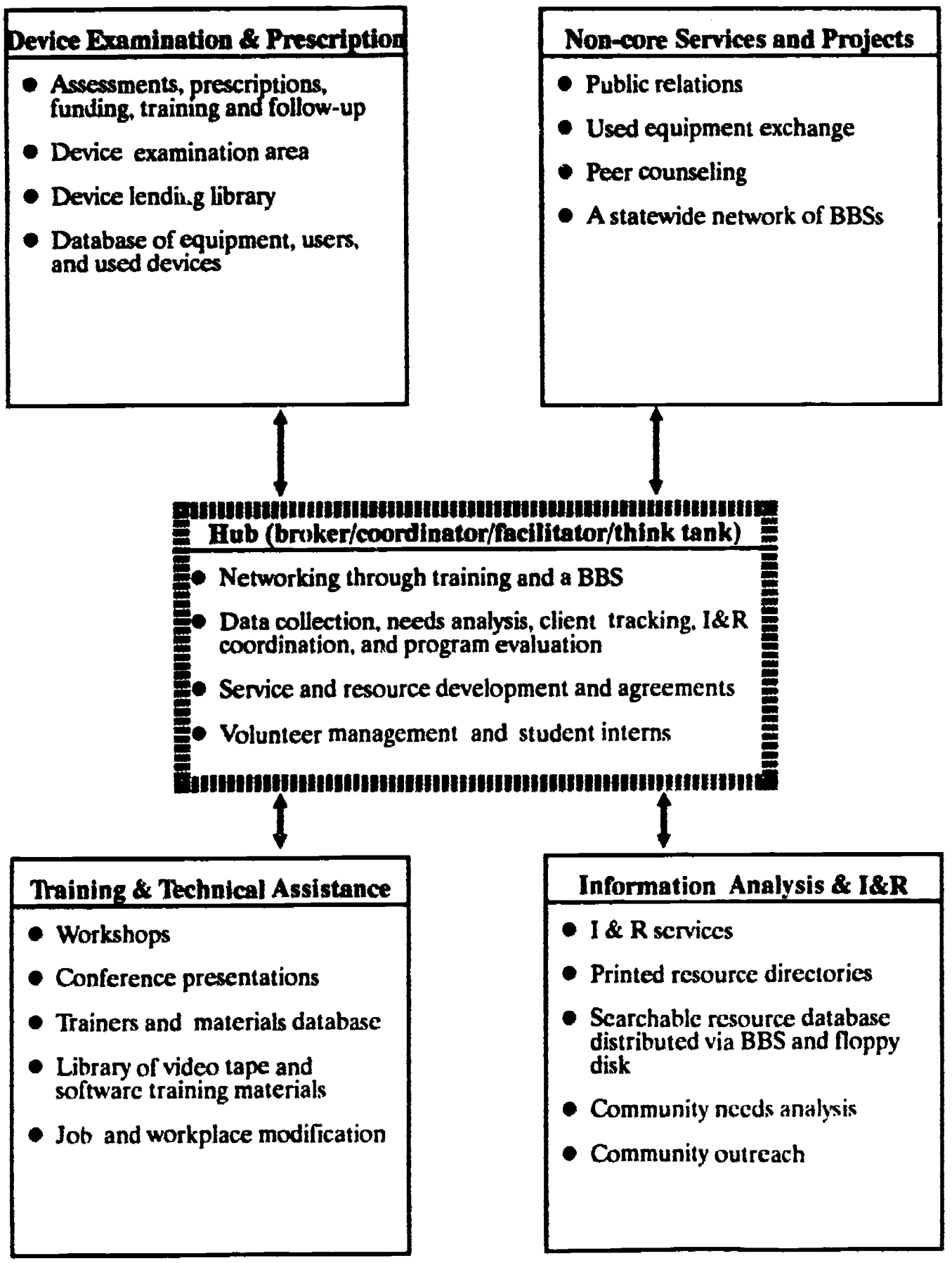
- Hub (broker/coordinator/facilitator/think tank).
- Device examination and prescription.
- Training and technical assistance.
- Information and analysis and I&R.
- Non-core services and projects.

The LATSN is graphically presented in Table II. The major categories of LATSN services will be described below.

Hub (broker/coordinator/facilitator/think tank)

A LATSN hub would serve as the brokers, facilitator, think tank, and coordinators of existing services. It would only provide services logically centralized and services unavailable through existing agencies. The idea is that new services are needed and old services need to be coordinated and reorganized to harness the potentials of technology. Starting a LATSN with all its parts located in one organization would be too expensive and would infringe upon rather than invest in existing services.

Table II: Services of a Local Assistive Technology Service Network (LATSN)



ITSD played this broker/coordinator/facilitator/think tank role and was welcomed by existing agencies. At its termination, ITSD merged into the CATS program which has similarities to the LATSN concept. CATS provides several new assistive technology services for one of the counties which was the focus of ITSD. Some major brokering and coordination services that a LATSN could offer are as follows.

Networking. The hub would facilitate the networking of existing services. Developing and coordinating training events could be an effective first step in networking. When the LATSN was established and support viable, an electronic BBS could be established. This BBS would allow parents, individuals with disabilities, and other interested persons to network with providers and each other. Inexpensive national electronic self-help conferences should be part of the BBS. The LATSN hub could provide the stability that a BBS requires, although consumers could control most of the content and operations. If sufficient resources were available to search out new information, BBS use by providers might be increased by making it easy for them to post questions and receive answers with minimal networking.

Data Collection, Needs Analysis, Client Tracking, I&R Coordination, and Program Evaluation. A major coordinating role of the LATSN involves collecting, coordinating and using data. While databases may be controlled by an entity other than the LATSN hub, the hub could play its coordination role to insure that data is collected using common terminology and that the data needs of the other components of the LATSN are met by all databases.

ITSD found that the automatic collection, analysis, and reporting of data on The DD Connection and DDTL were extremely valuable in fine tuning those services. The power of data to identify needs and monitor services should be incorporated into LATSN services. Indicators of needs and service quality should be established and routinely tracked. For example, the software which handles the LATSN I&R database should produce quarterly reports which address gaps in services. This data could be produced automatically if the initial I&R system development effort mandated it. Such publicly available periodic data will have a self-correcting influence on the service delivery system. A LATSN hub sponsored I&R think tank could meet periodically to discuss I&R improvements.

Databases may reside in any LATSN entity, yet all databases should be available to all LATSN entities and to consumers and providers. One way to make the data available is to have copies of databases available for searching under a BBS. This is similar to how the DDTL operates.

An example of database maintenance and sharing could involve ABLEDATA, a database of over 1600 devices. ABLEDATA is available for a minimal cost for the Macintosh HyperCard and will be available for IBM compatibles. The LATSN entity responsible for device examination and prescription could be the owner and primary user of ABLEDATA. They would insure that it is accurate and updated. Copies of the database should be available to other LATSN services. However, these services must be willing to share its acquisition and maintenance cost.

Service and Resource Development and Cooperative Agreements. Service and resource development are two of the roles the LATSN hub could perform. An example from ITSD will illustrate this point. Employment specialists in Dallas needed to share information about jobs not appropriate for their clients, yet suitable for the clients of other employment specialists counselors. They also felt that an overlap in efforts existed by different agencies for the same individual. They needed a mechanism to network about employment issues and to share information about potential jobs. By themselves, these workers did not have the time and expertise to put together a solution to their problem. ITSD met with this loosely organized group in think tank fashion. As a result, ITSD staff helped put together a grant application which used The DD Connection for networking along with an employment database. Other similar efforts occurred during the project period.

As new services develop, fragmentation, duplication and lack of coordination often exist due to political realities, funding streams and personalities. The LATSN hub could help negotiate cooperative agreements between local service entities to ensure that systemwide LATSN goals were achieved.

Volunteer Management ITSD found that the use of volunteers in assistive technology projects requires a professional effort with someone responsible for the complex mechanics required to make volunteer programs a success. Each entity involved with the LATSN needs different volunteers and it is rare that one entity will have the capacity to recruit, schedule, monitor and reward volunteers. The LATSN should have a strong volunteer effort, but only after it can be formally organized and run professionally by someone who is designated as the volunteer coordinator. An example of this volunteer effort might be contracts with local universities for interns which rotate through several LATSN entities to receive the training they needed. Student interns could be used to help with device prescription and to conduct planning studies and evaluative research.

Device Examination and Prescription

A second category of LATSN services involves device examination and prescription. Examination and prescription services include assistive technology assessments, prescriptions, funding, training, and follow-up. This function can be carried out through a LATSN entity which has a device examination area with a device loan program.

A device examination area would allow people with disabilities to come to a central location and try out devices. In some cases, they might take a device home for a trial period. Devices included in the center would be donated by vendors wanting to sell their products and by individuals who have outgrown or moved beyond the device they previously used. Lending libraries could allow trial use of prescribed equipment and prevent costly mistakes in equipment purchase. LATSNs across Texas could be encouraged to specialize in equipment, share equipment, and set up mobile clinics or satellites in rural areas. LATSNs would involve professional teams including PTs, OTs, and other assessment specialists. A device funding specialist would work with insurance companies and other funding sources. The LATSN should also have a database listing equipment for viewing and loan, users of equipment, those needing equipment, and the physical location of used devices.

The ITSD Project was hampered because device examination and prescription services were not adequately available in the local area. Workshops provided interest and more demand for services than the existing system could absorb. P.L. 100-407 needs assessment activities indicated that consumers want a substantial portion of any assistive technology program resources spent on device acquisition and associated services (Appendix N). Therefore, device examination and prescription services are key to the success of a LATSN. Without these services, a LATSN will only raise expectations.

Training and Technical Assistance

A third category of LATSN services involves training and technical assistance. Professionals need to be trained in the use of technology to enhance the learning, working, and living opportunities of people with disabilities. ITSD training workshops and other training efforts were well received locally and statewide. Training on assistive technology has repeatedly been identified as a high priority need by national, state, and local studies. For example, a Dallas/Ft. Worth (DFW) survey of 22 individuals in 19 service providing agencies conducted in November and December of 1989, indicated professional training on assistive technology to be a major need (Appendix P). A 1989 Texas survey of 1,500 rehabilitation professionals and consumers indicated one of the highest priority needs to be in the area

of training. The results of a series of Texas public forums, conducted to plan for P.L. 100-407, supported the need for training of professionals (Appendix N). Training needs include:

- General awareness for consumers on the role of technology in employment and independent living.
- Assistance for business and industry on using technology for supported employment assistance and job modification.
- Ongoing in-service training for professionals.
- Preservice training by institutions of higher education for the forthcoming generation of service professionals.
- Development of programs that would produce technology specialists able to meet the needs of individuals with disabilities.

Training and technical assistance can be provided in the form of workshops, conference presentations, and individual consultation. It can be provided by various LATSN entities on a contractual basis and may be a source of income for the LATSN. Training resources need to be accumulated and cataloged. For example, consumers and professionals should quickly be able to determine whether videotapes and training software exist on a subject area or device of interest.

Information Analysis and I&R

A fourth category of LATSN services involves information analysis and I&R. ITSD found that information, collection, and distribution is a major service of any technology service system.

While the LATSN hub might initially perform information analysis and I&R, these services are so important that they could evolve into a separate category of services as the LATSN matures. The following elements might comprise the LATSN information analysis and I&R function.

- Many coordinated and computerized resource databases.
- User-friendly software for an I&R specialist to search the databases.
- Software for tracking database use in order to print needs assessment reports such as type of requests, requests with no resources available, etc.
- Software for database management.
- Formats for database distribution in printed form and in floppy disk form.
- Software to make the databases available under a BBS.

Since information and referral would be a major function of each LATSN entity, it should be computerized. While each LATSN entity might perform I&R for its speciality area, the hub could be responsible for merging entity maintained I&R databases into one total LATSN I&R database. This total database could then be provided to all LATSN entities. BBS software could perform this database collection, updating, and distribution automatically if agreed upon I&R standards were adopted by the

LATSN. In addition, non-local I&R databases could be merged with local I&R database and distributed to LATSN entities and made available under the BBS. The DDTL illustrated the benefits of having resource information available in a database easily searchable by providers and consumers.

Community outreach would be an I&R activity for reaching potential clients, for example, parents of newborns with disabilities and the newly injured. All doctors, nurses, and hospital social service departments should be given a pamphlet about the present service delivery system.

Non-core Services and Projects

A final category of LATSN services involves non-core services and projects. Non-core services and special projects are organized activities which support various LATSN entities. They are not essential but enhance the functioning of a LATSN. They should be well organized with separate goals and objectives, assigned personnel, and budgets. Each should be periodically evaluated to determine whether the project is cost-effective for the LATSN. Over time, these services may prove their worth and evolve into core services.

Public Relations. ITSD found that assistive technology services are visually and emotionally appealing. Special public relations projects can be used to connect with consumer and parents and to generate resources and public good will. These public relations projects would not replace standard general public relations activities such as news releases and speeches to community groups. These special projects could take several forms. Students from a TV/Film class could make public service announcements. A local industry could sponsor a LATSN service and include information about that service in its local advertisements. Periodic contacts could be made with the reporters from the major regional newspapers who cover disability-related news. Profiles of individuals needing assistive technology could be circulated to locate sponsors to help acquire the device. The ITSD Project believed that these public relations projects can be more successful than anticipated and should only be conducted when the LATSN has the capacity to professionally handle the requests they generate.

Peer Counseling Service. Another special project could be a peer counseling service where users of a device who are willing to share their experiences could become part of the delivery system. ITSD found that peers are very willing to help if the mechanism for doing this is available. A registry of peer counselors might contain the following:

- Those willing to share experiences with a device via the telephone, home visit or BBS.
- Those willing to train others on a device with which they are familiar.

- Those willing to loan out their device for a trial period.
- Those willing to repair devices.
- Those willing to help design and build new devices.

Since many assistive devices exist, the peer counseling service could be offered on a statewide basis. ITSD found that even a large urban area such as Dallas/Ft. Worth may not have sufficient number of assistive device users to currently justify a formal peer counseling service.

Networked BBSs. Another special project could be developing a network of non-local BBS devoted to people with disabilities. Each BBS could model the operations of The DD Connection (Appendix A). The BBS of each LATSN could connect to the BBSs of other Texas LATSNs to develop state and nationwide electronic conferencing for professionals and consumers. Where a LATSN did not have the capacity to operate its own BBS, it could contract with an existing BBS in the community to pick up the needed conferences. Contracting with a BBS which is operated by a person with a disability or a BBS operated by a health and human service agency would be preferable.

Two advantages exist for networking local BBSs. The first is that consumers could be heavily involved in operating and maintaining the BBS. The second advantage is that use could be free. Cost is extremely important to many people with disabilities who may operate a computer very slowly. For example, some users were on The DD Connection for hours due to operating their computer with a head pointer or due to a speech synthesis device reading each character on the screen. Commercial BBSs often make slow interactions prohibitively expensive. They may also contain graphics which are difficult for speech synthesizers to handle.

A network of local BBSs might have the capacity to leverage funds from industry. Experience with formal industry involvement in technology projects illustrates that industry might be willing to sponsor various BBSs conferences on a statewide basis in exchange for company and product recognition.

Scenarios of Helping Individuals through a LATSN

The scenarios that follow illustrate the many coordinated services that a LATSN could provide. They also illustrate the coordination between service entities and the single point of entry into the service system.

Example 1: Need for Low-technology Device Design and Modification.

Tony, a young resident of a state facility, has for years had to hide behind a plastic mask, which protects him from his own pica behaviors, i.e., "swallowing non-consumable objects." This mask, which he must wear 24 hours a day, was pieced together by concerned staff at his facility. In the words of a staff member, "it leaves something to be desired" in appearance, in comfort, and in it's ability to inhibit Tony from obtaining and swallowing harmful materials and objects. The plastic face guard presses on Tony's face and is extremely hot in warm weather. In spite of the best efforts of staff, sometimes Tony's friends help him ingest something harmful. The immediate problem is to develop an assistive device that would protect Tony from himself, be comfortable enough to use 24 hours a day, and yet look attractive to enhance Tony's self image.

The LATSN would use the following strategy to help Tony. First, LATSN assessment and prescription staff would visit the State facility and Tony to assess the potential of technology to help in Tony's situation. Funding for such a device would be discussed. A team of specialists in technology and disabilities might be brought together for a detailed assessment of Tony's situation. If technology was an option, the device databases would be searched for appropriate devices, publications, agencies and vendors. If no appropriate resources were found, a search of the volunteer database might reveal a local groups of engineers interested in helping construct devices. The LATSN would act as the liaison between the state facility and the volunteers. If feasible, the device would be engineered by a team of volunteer engineers and university students. If the State facility would pay for the effort, the resulting funds would be placed in an account to be loaned to pay for future device modifications.

Example 2: Need for a High-technology Communication System.

Andrew has severe physical disabilities which also substantially limit his ability to communicate. He is unable to vocalize or sit upright for extended periods. Through a previous LATSN effort, he has learned to communicate slowly, yet painfully, using a light pen attached to his head while pointing to words on a non-electronic communication board. His body requires constant therapeutic support and his current method of communication strains his already weak body. The current need is to develop an appropriate seating/communication system for Andrew that would allow him therapeutic support, freedom of movement, and communication with others in his environment. Andrew would benefit from a wheelchair with an adapted seat that could be combined with environmental controls and an electronic communication system.

A LATSN could help Andrew by bringing together a team for Andrew's assessment. Andrew's parents may be provided with the names of users of the devices that looked promising. After discussion and possible personal visits to peers, Andrew and his parents would select a device for consideration. The LATSN would help Andrew and his parents find a device through the used device database, the device lending library, or by seeking users willing to loan a device. After a suitable device was found, the LATSN's device finance specialist may help Andrew's parents finance the device selected. Peer training on the device might be available. Andrew's and his parents' names might then be added to the "users of devices" database so they could help future clients.

Example 3: Need for Job Modification and Supportive Employment.

Debbie is a 28 year old woman who has lost the use of both hands, yet could possibly be employed in creative writing, if she had an alternative means for word processing and entering a work environment. Debbie is aware that "something" exists, like a voice activated system. However, she is not sure of all of her alternatives and what might work best for her, or even where to go to evaluate different systems. She is also unsure if she could find someone to employ her even if she obtains a functioning system.

The LATSN would assist Debbie by developing a service strategy based on her initial call for assistance. It could schedule her visit to a device examination area where Debbie could come, meet with trained staff and actually try out different systems to assess what alternative input device would be most appropriate for her needs. Funding alternatives could be explored. Once the device was acquired, Debbie could take advantage of job listings posted by job placement specialists on the BBS. Calling into the BBS would provide a mechanism to network with job placement specialists and others who may have experienced similar problems. Employers interested in hiring Debbie could contract with the LATSN for advice on how to modify the workplace to accommodate Debbie's needs. Debbie's progress could be tracked by a LATSN entity to insure her needs were being met.

Role of the DD Council in the model

A LATSN is based on the systems concept of teamwork or synergy where the whole is greater than the sum of the parts. While agency teamwork is beneficial for the client, it requires that individual agencies sacrifice for the good of the total system. Without pressure from funding sources, agencies tend to optimize their individual resources and services and the synergistic effects suffer. TPCDD funding should encourage cooperation and coordination and discourage fragmented services.

One way to achieve synergy is to require consumer members who can speak for the total system to serve on all boards and committees. Another way is to encourage formal coordination and cooperation, especially on databases and collected information. For example, if a resource database is established and maintained with TPCDD funds, the database should be periodically placed on floppy disk and distributed automatically to anyone wanting the database for their own use. Printed copies should also be automatically distributed. Databases that are developed and maintained by TPCDD funds should never be the exclusive property of the collecting agency.

TPCDD activities should address another critical ingredient of the LATSN concept. The startup costs of the brokering/coordination/facilitation/think tank entity can rarely be borne by an existing service program or generated through the merger of weak existing services. Small coordinating or startup grants are needed to allow the LATSN to develop in a logical way. Without funding of this coordinating/broker role, services will emerge in an uncoordinated and duplicative fashion based on potential profit and the interest of the existing system. Consumers are not best served through this evolutionary approach. For example, three rehabilitation services opened last year in Tarrant County. Each was designed to serve a similar market.

Another important role of the TPCDD would be to provide technology training. Small contracts could be given to Independent Living Centers or others capable of bringing vendors, experts and providers together. These training sessions could be small (10-30 participants) and 1/2 day long. TPCDD could also sponsor agencies to put on technology events at local conferences.

Another LATSN activity needing TPCDD attention is the development of statewide databases. LATSNs are local entities, but each local LATSN would need similar statewide information. For example, local LATSN entities may specialize in assistive devices, but a statewide database is needed for used devices and devices available through lending libraries. Similar statewide efforts are needed to coordinate local peer counseling programs and to connect local BBSs. Long term funding of statewide databases is a key issue. The continuation funding effort may involve rearranging statewide reimbursement practices as well as fundraising.

Resource development points to a final role that the TPCDD can play, that is, developing a coordinated statewide approach to involving industry in technology projects. An RFP could solicit ideas for formal statewide industry involvement and periodically fund the most promising projects. The

literature could be monitored and coordinated industry projects like Cristina and CompuMentor could be investigated for implementation in Texas.

Recommendations to the TPCDD

The ITSD Project found a service delivery system strapped for resources and overwhelmed with its current services. It was unable to integrate technology into services on a coordinated basis. It also found many people with disabilities who were willing to assist in worthwhile efforts.

The recommendations that follow are characterized by activities which build upon, leverage, and expand the existing system. Coordinated information collection and dissemination is at the core of many of the recommendations. The recommendations also try to empower people with disabilities to help manage the service delivery system. ITSD found that volunteers and consumers can become part of the service delivery system and be given greater control over service provision.

Statewide Recommendations

Recommendation: An 800-number for statewide information on assistive technology should be established. This service should be coordinated with other state and local I&R efforts. The DDTL could continue to be the statewide assistive technology resource database and contract with Texas I&R providers to sell the list of resources in printed form or on floppy disk.

Recommendation: Statewide assistive technology projects should facilitate the development of pre-service and in-service training on assistive technology. Projects should be encouraged to work with local universities to place student interns into agencies which have technology as part of their mission. Contracts might be given to Independent Living Centers or others capable of bringing vendors, experts and providers together. These training sessions should be small (10-30 participants) and not over one day long. TPCDD should also sponsor agencies to put on technology events at local conferences.

Recommendation: Resource databases warranting statewide distribution should be collected and made available to all state services through a printed manual and on a easy to search floppy disk. For example, TPCDD could fund the development of a statewide database of peer counselors and the assistance they can provide. Any consumer seeking advice could call a local independent living center or 800 number to obtain the names of the closest peer counselors. This information could also be loaded into software and distributed via floppy disk and BBS. Several successful models exist, for example, the Texas Network for Children, Youth and Families, Inc. distributes a searchable floppy disk which matches children to out-of-home care providers.

Recommendation: A statewide system of local computer bulletin boards which contain information on disabilities and technology should be established, because BBSs are an efficient way to exchange information between professionals and consumers. The beginnings of this system exist with The DD Connection and other Texas BBSs which already carry information on disabilities and technology.

Recommendation: TPCDD should consider funding several LATSN startup projects in several major Texas cities. The hub services of broker, coordinator, facilitator, and think tank should be the first funded.

Recommendation: An effort should be made to develop mechanisms where industry could be involved with technology projects on a formal, coordinated, statewide basis. For example, the TPCDD might issue a Request for Proposals seeking projects which link industry with assistive technology services on a statewide basis.

Recommendation: Several model projects to use volunteers throughout the service delivery system should be tested. TPCDD could fund efforts to make use of volunteer and computer clubs. Each effort should produce a "how to" manual for agencies wishing to set up volunteer programs. The manual should contain a list of do's and don'ts along with key factors for success and key issues which must be addressed. Software for volunteer management should be explored.

Recommendation: Television Public Service Announcements should be developed. These announcement should provide an 800 number for more information on technology and for referrals into the service delivery system. Those announcements should be aired only when the system is capable of responding to the expectations generated.

Recommendation: Statewide assistive technology projects should include an equipment donation program. The program should match needs to equipment rather than become a warehouse for used equipment. The program should designate personnel to ensure that equipment is evaluated and distributed.

Recommendation: A statewide registry of training experts and resources should be developed. This registry should include training software and video tapes on assessment and devices.

Recommendation: TPCDD should take measures to ensure that funded projects involving technology complement and are consistent with the overall State Plan for Assistive Technology submitted under P.L. 100-407.

Recommendation: Statewide technology projects that develop software should ensure that automatic data collection and dissemination on software performance be built into the software and project performance evaluations.

Recommendation: TPCDD should use universities to experiment with software development concepts and issues. Once a software solution is defined and found workable, the final product should be developed in an environment where reimbursement can be flexible and easily tied to periodic evaluations.

Recommendation: TPCDD should use software vendors to develop software in areas where the conceptual framework contained in the software is relatively stable. Vendor progress on software should be reexamined periodically and contract modifications made accordingly.

Recommendation: The final product of any software development effort should be easily updatable by agency staff.

Recommendation: Subscriptions to national electronic networks by TPCDD projects should be encouraged. However, usage criteria should be set up before the subscription begins and the use vs. cost should be evaluated quarterly. If use is not as expected and the information does not justify the cost, the subscription should be dropped.

Local Recommendations

Recommendation: Local assistive technology projects should ensure that I&R services are provided in electronic and printed form. If possible, database and desktop publishing tools should be used to permit easy updating, consumer access, and to lessen production costs.

Recommendation: Assistive technology projects should include funding for a volunteer coordinator to allow volunteers to augment publicly funded activities.

Recommendation: To help agencies integrate technology into services, agency management technology needs should be addressed when providing staff training on assistive technology for individuals.

Recommendation: Local assistive technology programs should accept physical donations of used equipment with caution and only if they have the capacity to evaluate the equipment. They should begin with used equipment by playing a broker role, i.e., keep a database of needs and potential donations. They should physically accept equipment only after they determine that repair and distribution time/costs are less than the purchase of new equipment.

Recommendation: Local assistive technology projects should provide support for electronic BBSs to enable consumers and providers to solve technology issues and share information without assistance from service providers.

Recommendation: When developing computing systems, use off-the-shelf proven software if possible. Systems requiring programming or the connection of independent software programs should be considered research efforts which might be subject to time delays and unexpected failures.

References

CompuMentor startup kits can be obtained from CompuMentor, Attn: Daniel Ben-Horin, 385 8th St., 2nd Floor, San Francisco, CA 94103 (415-255-6040).

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National Cristina Foundation, Attn: Yvette Marrin, 42 Hillcrest Dr., Pelham Manor, NY.

Texas Rehabilitation Commission (1979) A proposal for Technology Assessment and Transfer to Rehabilitation: Grant Continuation Application. Author: Austin, TX.

Appendices

The DD Connection and Technology Library

Persons with an interest in disabilities or handicapping conditions should logon to The DD Connection. The DD Connection is an electronic bulletin board in the Dallas/Ft. Worth Texas area which provides electronic mail, software transfers, database searches, and conferencing.

The DD Connection is OPUS Node 130/10 of a worldwide system of local bulletin boards which have the capacity to automatically exchange messages and files. Each night during low-rate telephone hours, over 6000 participating BBSs send electronic mail and files. In conference or echomail message areas, all local messages are circulated each night to all other BBSs which are members of the conference.

Unique to the DD Connection BBS is a used equipment exchange which repairs and distributes donated used equipment to those with disabilities.

DDC Message Areas

- General messages and information (monitor = ARC/US)
- Private messages between users (delete your old messages)
- Transportation & technology (monitor = Walter Hart)
- Activities of daily living & tech (monitor=Dallas Ctr Ind Liv)
- Communications & technology (monitor = Maggie Sauer, ARC/US)
- Special Education & Technology (monitor Al Cavalier)
- Disabilities & tech. Q&A {ABLED echo} (monitor=Jerry Orton & Gene Chase)
- Human services & computers {CUSSnet echo} (monitor=Dick Schoech)
- Mental health Q&A {psych echo} (monitor = Martha Brewer)
- Vietnam veterans Q&A {echo} (monitor = Michael Rodriguez)
- Computing technical questions & answers (monitor = John McNeely)
- Health questions & answers {echo} (monitor = Mike Welch)
- RESNA Message Area (Monitor = Dave Jaffe)
- Contents of latest publications (monitor = Darlene West)
- International NETmail area
- Exchange of used equipment & devices (monitor = Dick Schoech)
- Spinal injury Q&A {echo} (monitor = Walter Hart)
- Hearing Impaired Q&A {SILENTTALK Echo}
- Job Opportunities (monitor = Carlos Lopez)
- Questions & answers about OPUS {echo}(monitor=Duncan Seavey)
- Conferences, Workshops, and Training (monitor = Darlene West)
- Traumatic Head Injury ECHO Area
- APPLE Information Exhange (monitor = Fred Sheffler)
- Visually Impaired Q&A {Blinktalk ECHO} (monitor = Skip Cook)
- Stress Management Q&A {echo} (Monitor = Mike Welch)
- Amputee discussion {AMPUTEE echo} (monitor=Bill Baughn)
- RESNA SIG on Networking
- APPLE ECHO {point = Fred Sheffler}

File Areas

- Upload area for all files—assistant sysop priviledges required
- Mental Health files and text
- Files concerning employment
- Utilities of interest to those in human services
- Files related to disabilities and technology
- Health files and text
- Educational and training files
- Games for persons with disabilities (monitor = Al Cavalier)
- Agency Management files and text
- Files for persons with visual problems (monitor = Skip Cook)
- Files uploaded within the last 30 days
- Files to other users—public & held 30 days (monitor=J. Orton)
- Information and help for DDC users
- RESNA File Area (Monitor = Dave Jaffe)
- Amputee Support Group files (monitor = Bill Baughn)
- DDTL Search Results
- Apple files - monitor access.

DD Technology Library Areas (searchable by keyword, city, state, or title)

- Resource organizations for assistive technology assessment, prescription, and followup
- Vendors of assistive technology
- Publications on assistive technology

Communication parameters: phone = (817) 261-6309; 300-2400 BPS, 8 data bits, 1 stop bit and no parity.

Developed through the Integrating Technology into Service Delivery (ITSD) Project, a project of the Texas Planning Council for Developmental Disabilities, funded by the Texas Rehabilitation Commission.

Appendix B: Examples of Messages from The DD Connection

From: [redacted]
To: [redacted]
Subject: disabled wife

Msg #62, 09-Jul-90 08:23:54

My wife suffers from minor siezures about every two to three days. They disable her motion, her speech, and her memory. She has been told by her Doctor that she thinks she has either has multiple sclerosis or aterioscleroseis. She has not been able to work since Feb 1989. She also has not received any benifits from Social Security because the Doctor will not put in writing that she is totally disable. Where do we go from here. We have an attorney on this but what can we do in the mean time. We have filed chapter 13 bankruptcy to take some of the burden off of us .What else can we do. I guess I should mention that I had back surgery because of an on the job injury. Right now I am receiving full salery but that could change any time. If not for the injury I could work on a part time job. Any suggestions would be helpful. I hope this doesn't sound to much like begging but it probably is.

*** There is a reply. See #69.

From: [redacted]
To: [redacted]
Subject: Contact Me Immediately

Rec'd
Msg #69, 16-Jul-90 10:16:08

Curtis, there are laws pertaining to this kind of situation. I am the publisher of an information to the HANDICAPPED called The UN/Limited. I did not notice whether you are in the Metroplex or not; if so, immediate contact can be made by calling me at metro (817) 577-2048. Ask for Elliott. If you would prefer to write: The UN/Limited - P.O. Box 1388 - Hurst-Ft Worth, Texas 76053-1388....Elliott E. Chase

0:40;36mFrom: [redacted]
To: [redacted]
Subject: SPECIAL KeYBOARDS

Msg #154, 16-Dec-88 19:41:34

DOES ANY ONE KNOW OF A COMPANY WHICH HAS SPECIAL KEYBOARDS?
MY DAUGHTER HAS CEREBAL PALSEY AND CAN ONLY USE HER RIGHT HAND. HOWEVER, THE RIGHT HAND ONLY HAS LIMITED FINE MOTOR FUNCTION. SHE IS FIVE YEARS OLD AND LOVES TO "WORK" ON HER DAD'S PC. I WOULD LIKE TO FIND A KEYBARD WHICH IS DESIGNED TOWARDS HER AGE AND NEED. THE KEYBOARD WOULD NEED TO BE COMPATABLE WITH AN IBM AT OR COMPATABLE.
THANKS

*** There is a reply. See #155.

From: [redacted]
To: [redacted]
Subject: Keyboards

Msg #158, 20-Dec-88 19:18:20

Rick, about that special keyboard, I can get you any number of regular IBM compatible keyboards at flea market prices that we can maybe modify or special purposes. This might be more cost-effective than buying one . a regular source if we can determine exactly what to do to it. Also, try a program called KEYLOCK in the files section. It is a TSR that locks the <Ctrl>, <Shift> and <Alt> key so you can get any "Chord" with a single finger. I've tried it and it really works! That's a software approach. Keep us posted on any progress you make and let us know what you find out and maybe still need.

From: [redacted]
To: [redacted]
Subject: Area 12 fun

Pvt
Msg #12, 07-Mar-90 03:50:06

Dick,

This is more of a comment than a message, so you can <K>ill it and you don't need to reply.

As you know, I attend UTSWMC. We are always talking about something new in the field of Rehab. that relates to medicine (usually to the point of where you need a MD to understand what they're talking about). Anyway, I have found several topics in area 12 that were of interst to my counseling class. The last message that I captured to disk was so interesting to the class that our instructor made photocopies of it and passed it out to the whole class! This is really working out well!!!

From: [redacted]
To: All Texans With Disabilties Msg #100, 05-Nov-89 03:05:28
Subject: ADA

Every Texan with any sort of disABILITY and their family and friends should read and act on this message !! The House version of the Americans with disABILITIES needs your help! Call your Congressmans office TODAY ! Urge him to become a sponsor of HR-2273. If you are uncertain who he is and don't mind a $4.95 phone call simply call 1-800-257-4900 ask for Hotline Operator 9565 supply your full name, address, zip code and home phone number.

Anyone in the Tarrant County that needs or wants to know more is welcom to call me at (817) 336-8201. On hand will be a list of the Congressmen. We especially need help with Pete Gerens since he has been assigned to the Committees, Transportation and Public Works.
Walter Hart, Tarrant County Co-ordinator, Texans for Passage of ADA

From: [redacted]
To: All? Msg #64, 03-Oct-89 15:10:30
Subject: Polio

I've been looking all over the board for someone who actually had and lived thru Polio. No Luck!!! Is there anyone besides myself who had polio? (I had it in 1951, almost 40 years ago. I knew a bunch of folks who had the same just 10 years ago; I can find none of them now.)

Of course, I'd be happy to talk with anyone here that wants to talk. I suppose this is more of a message of "HELLO" than anything.
.....Thanx.....Gene.....

From: [redacted]
To: [redacted] Msg #73, 09-Oct-89 15:35:36
Subject: Polio Support Group

Gene,
Try Contacting the Texas Polio Survivor's Association, P.O. Box 35688, Houston, TX 77235-5688. They have local groups in Dallas and Fort Worth but I don't have the numbers or addresses.

All the Best,

From: [redacted]
To: All Msg #25, 19-Jul-90 14:14:18
Subject: Sale of speech synthesizer

I am selling the Votrax Personal Speech System Synthesizer. This is an external synthesizer that works with IBM computers and compatibles.
This synthesizer is less than two years old. I paid almost $500.00 for it new. It still works; in fact, I am using it now as I write this message; however, I want to upgrade my system. All offers and questions concerning this synthesizer may be sent to me here or Net Mail, area 2 of this board. Thank you for your interest.

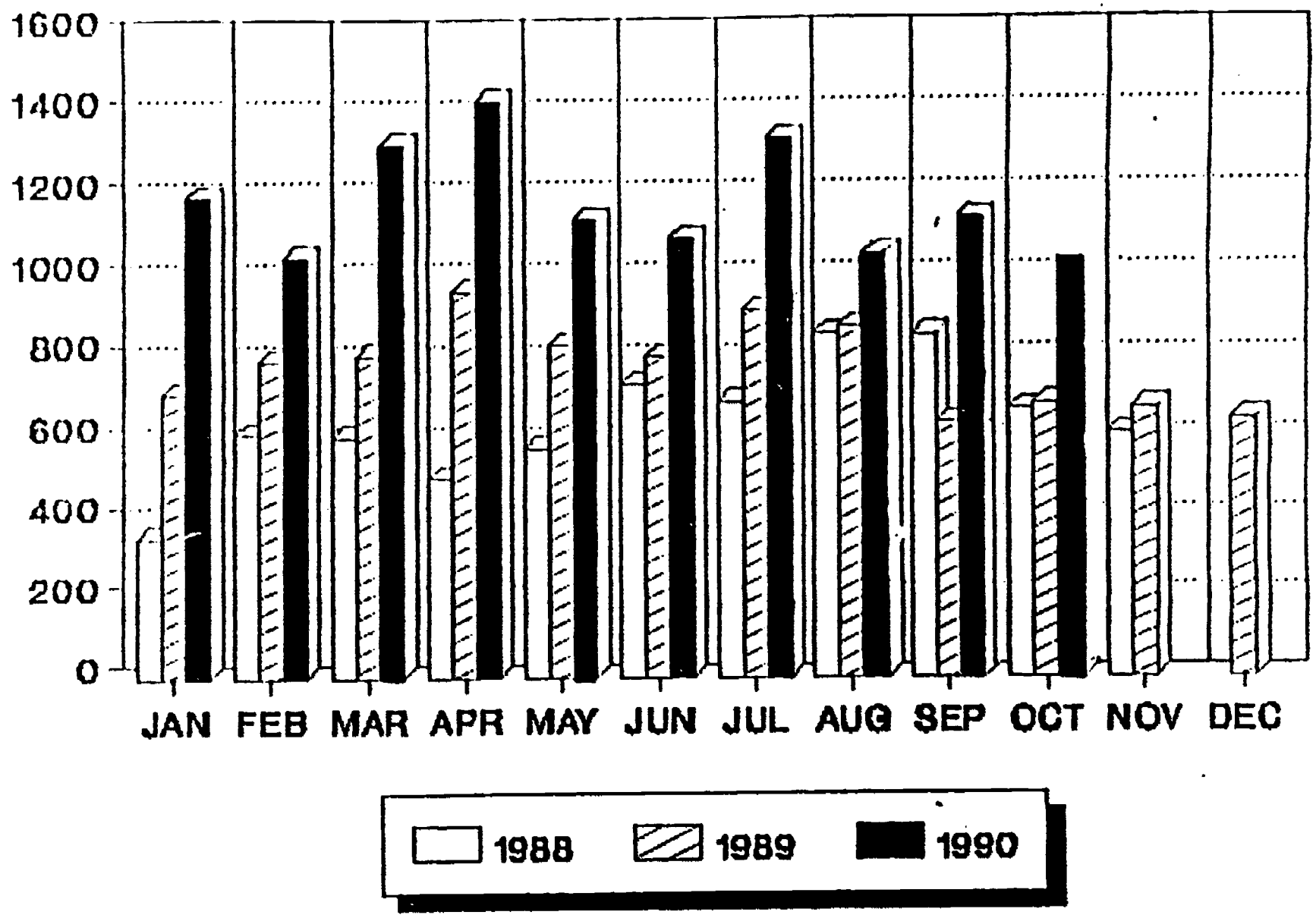
From: [redacted]
To: All Msg #85, 24-May-90 23:28:10
Subject SELF DEFENSE

HELP!!!!!!! I am new to the DFW area and usually work at night and was recently attacked in the parking lot..I am looking for a self defense class/seminar for handicapped especally Para/quads ..... I am a para and in good health... If anybody has any ideas please leave me a message here or call at 214-739-1226
.
THANKS LOTS JAMES

From: [redacted] Pvt
To: [redacted] Msg #63, 10-Sep-89 15:35:46
Subject: SPEECH DEVICES

THANKS FOR YOUR SUGGESTION THAT THE SPEECH PATHOLOGIST AT CHILDREN'S HOSPITAL IN FT. WORTH BE CONTACTED, AS SHE THEN REFERRED ME TO THE SPEECH PATHOLOGIST AT HARRIS HOSPITAL WHO WILL CALL BACK MONDAY AS SHE MUST FIRST CHECK WITH HER BOSS AS SHE DOESN'T KNOW WHAT THE LEGAL RAMNIFICATIONS MIGHT BE TO SEE A CLIENT THAT WASN'T REFERRED TO HER BY A PHYSICIAN. SHE SUPPOSIVELY HAS NUMEROUS DEVICES THERE IN HER POSESSION,AND SHE MIGHT BE ABLE TO GET US ONE IF WE WILL JUST GO THOUGH HER. THE WHOLE SYSTEM IS BASED UPON INSURANCE COMPANIES AND THE MEDICAL PROFESSION, SO IF A PERSON, LIKE MYSELF, WANTS TO BYPASS ALL THAT,THEN THEY JUST DON'T KNOW HOW TO DEAL WITH THE SITUATION. IF I HAD STARTED WITH A PHYSICIAN,THEN I WOULD HAVE A DEVICE BY NOW, BUT I TRIED TO DO IT ALL MYSELF AND FAILED. THAT IS A MAJOR WEAKNESS OF DDTL. NAMELY THE PERSON USING IT HIMSELF IS UP AGAINST THE ENTIRE MEDICAL PROFESSION, AND THEIR VESTED INTERESTS. THEY WOULD MUCH PREFER THAT A LAYMAN GO THOUGH THEM AND ALSO GIVE THEM A CUT.

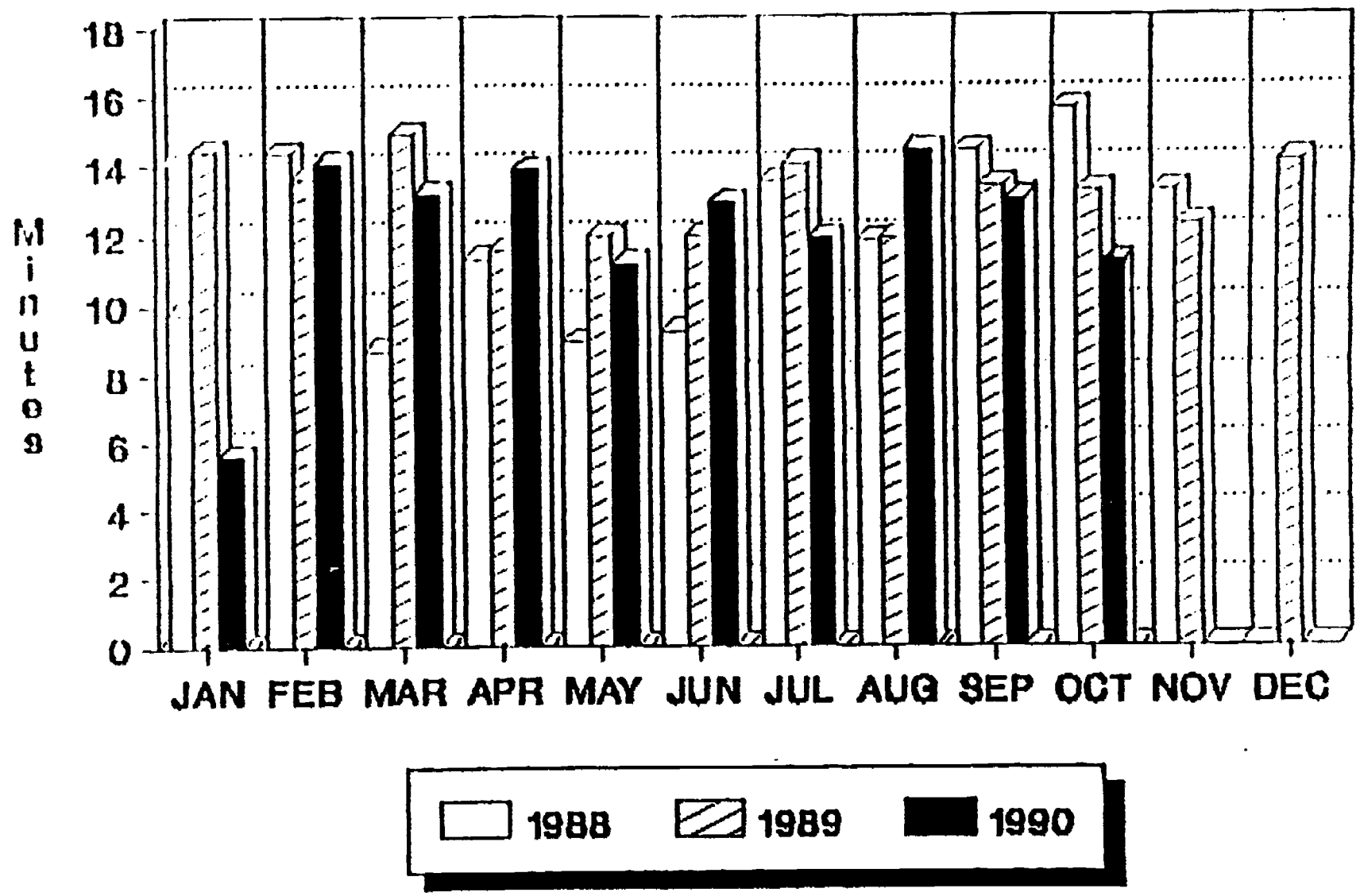
Total Number of Calls to DDC/DDTL



Source: DDC Logs

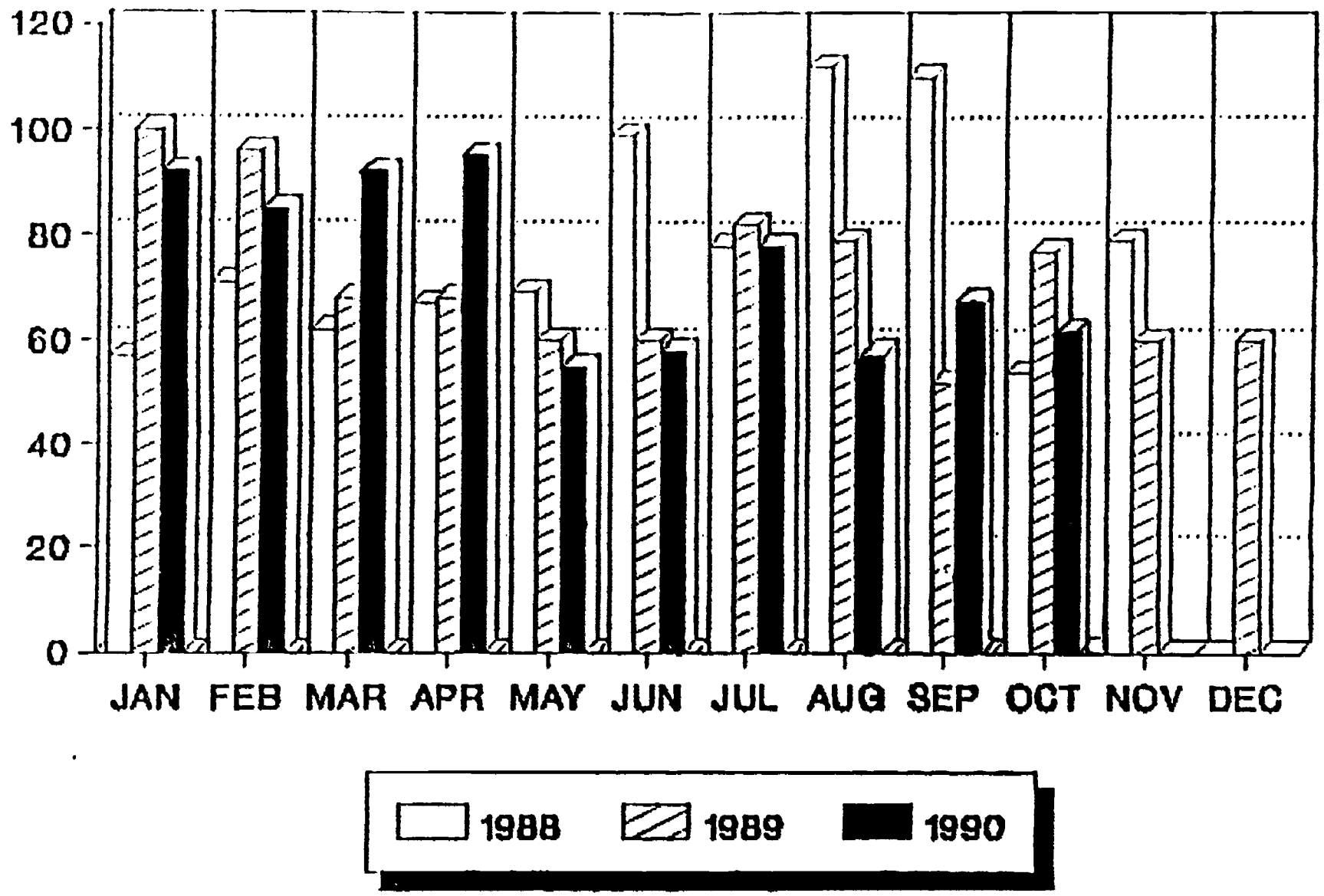
Appendix C: Total Number of Calls to the DDC/DDTL (1988-1990)

Average Call Duration



Appendix D: Average Call Duration (1988-1990)

New Subscribers to DDC/DDTL

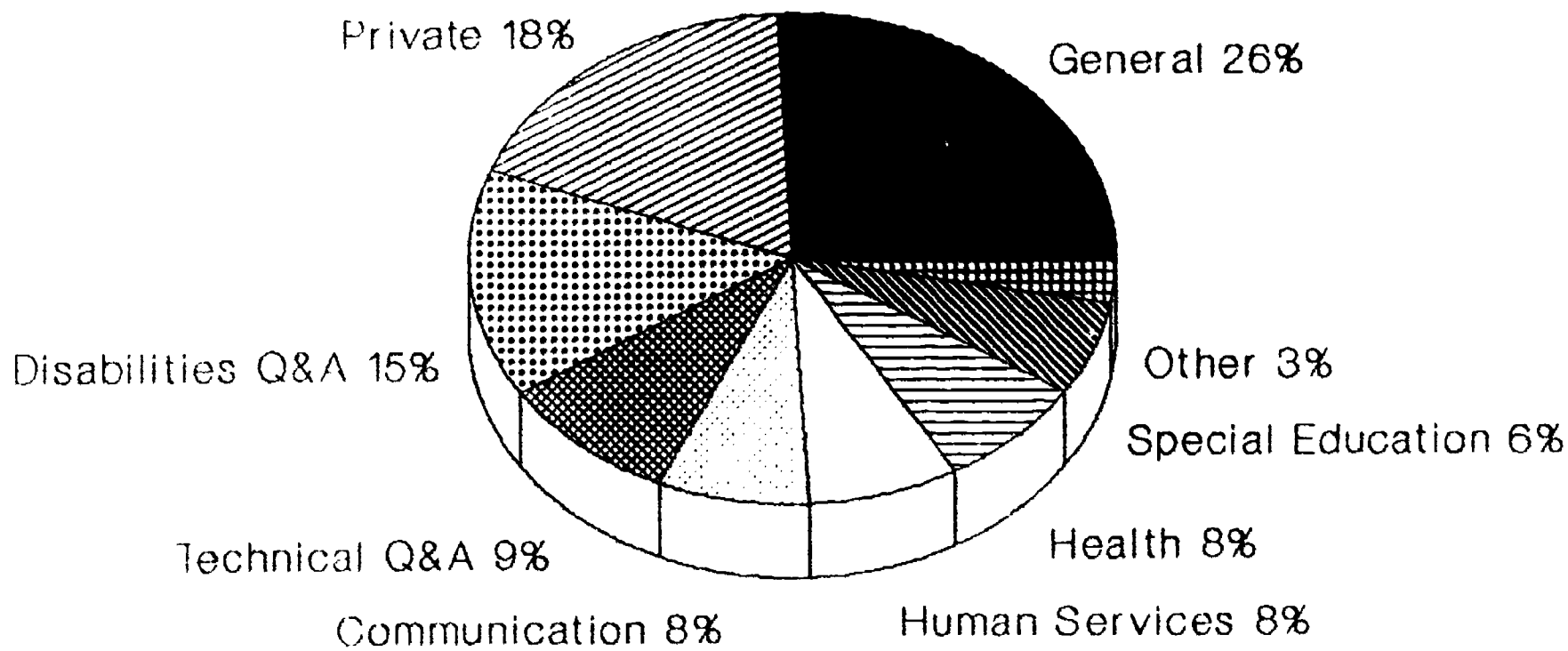


Source: DDC Logs

Appendix E: New Subscribers to the DDC/DDTL (1988-1990)

DDC Message Areas
Perceived Usefulness

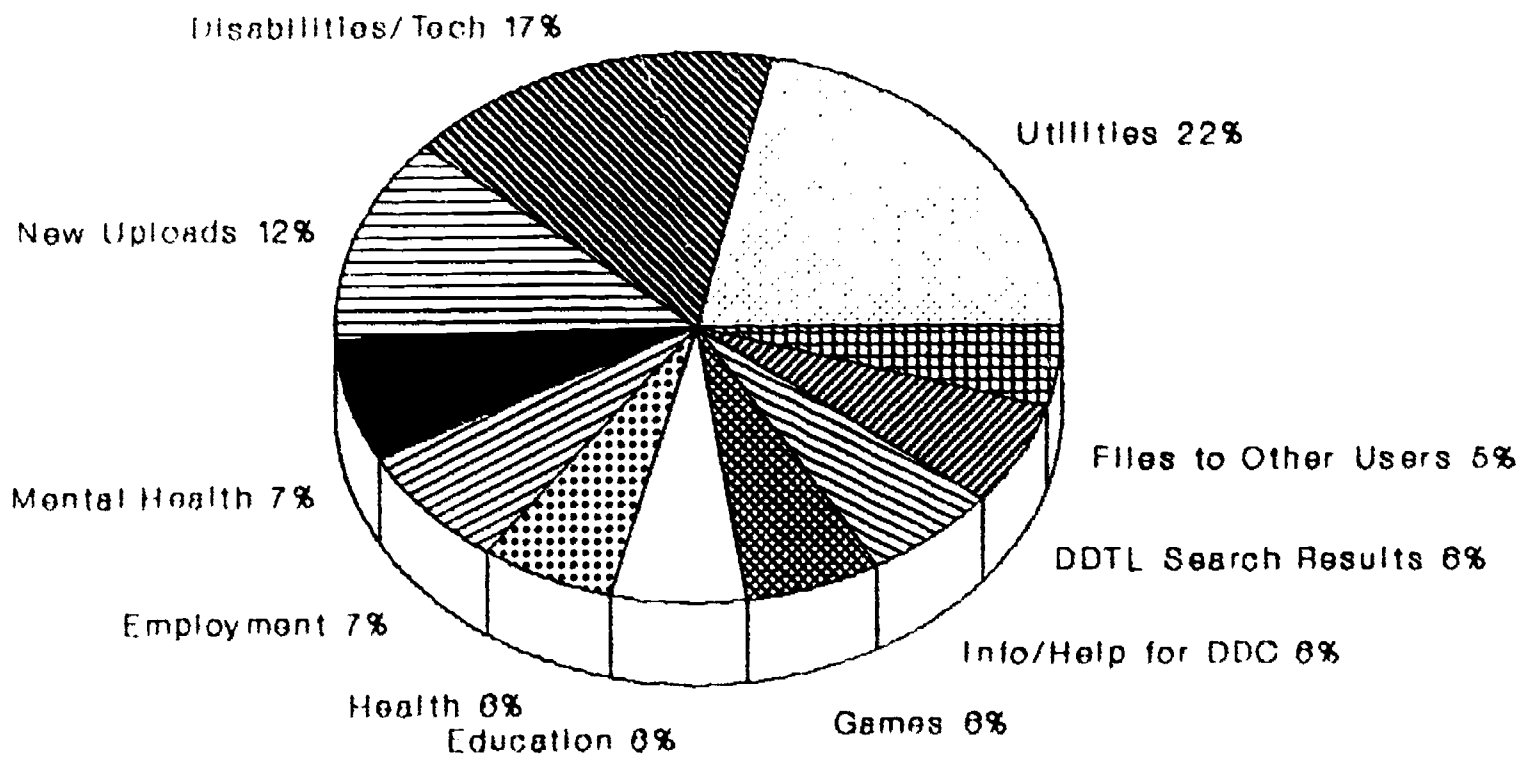
Which message are most useful to you?



ITSD On-Line Survey (09/89)

DDC File Areas
Perceived Usefulness

Which File areas are most useful to you?



ITSD On-Line Survey (09/89)

Appendix H: Survey of Former DD Connection Users: February 1990

Overview:

The ITSD Project surveyed 15 agencies who were users of the DDC and who have not logged on in several months. Several of the agencies received UTA equipment.

Agencies surveyed included three MH/MR facilities, two hospitals, five private and university affiliated rehabilitation program or organizations, one school district, one educational service center, and three service agencies (UCP, Easter Seal, etc.). The five individuals were chosen at random with two being recipents of ITSD equipment.

SURVEY QUESTIONS AND RESPONSES:

Question 1: We have noticed from the DDC logs that you have logged on to the DDC in the past and then stopped logging on. What are some of the reasons you stopped logging on?

Reasons Mentioned	Times Mentioned
Lack of time	11
Personnel changes/shortages	4
Not useful for applications they needed	4
Equipment problems	3
Lack of experience with BBS's	2
Didn't remember logging on	1

Surveyor's Summary: Most respondents indicated they felt the DDC appeared useful and user friendly. The most common reason given was lack of time and personnel changes.

Question 2: Of the reasons mentioned above, which are the top two reasons?

Reasons Mentioned	Times Mentioned
Time restraints	18
Change in/shortage of personnel	5

Surveyor's Summary: Some respondents indicated that time restraints were due to increased responsibility because of personnel shortages.

Question 3: Would any changes in the DDC make you a regular DDC user?

Reasons Mentioned	Times Mentioned
N/A	13
More specific information present on BBS	5
More training	1
More games	1

Surveyor's Summary: Most respondents stated that any changes in the BBS would not be applicable as their lack of participation was due to external circumstances (personnel changes, time restraints, etc.)

Question 4: Did you try searching the DDTL resource database? If so, can you note anything you liked or anything that could be improved with the DDTL?

Reasons Mentioned	Times Mentioned
Found nothing in it which was useful	4
Make more complete	2
Database didn't work	1

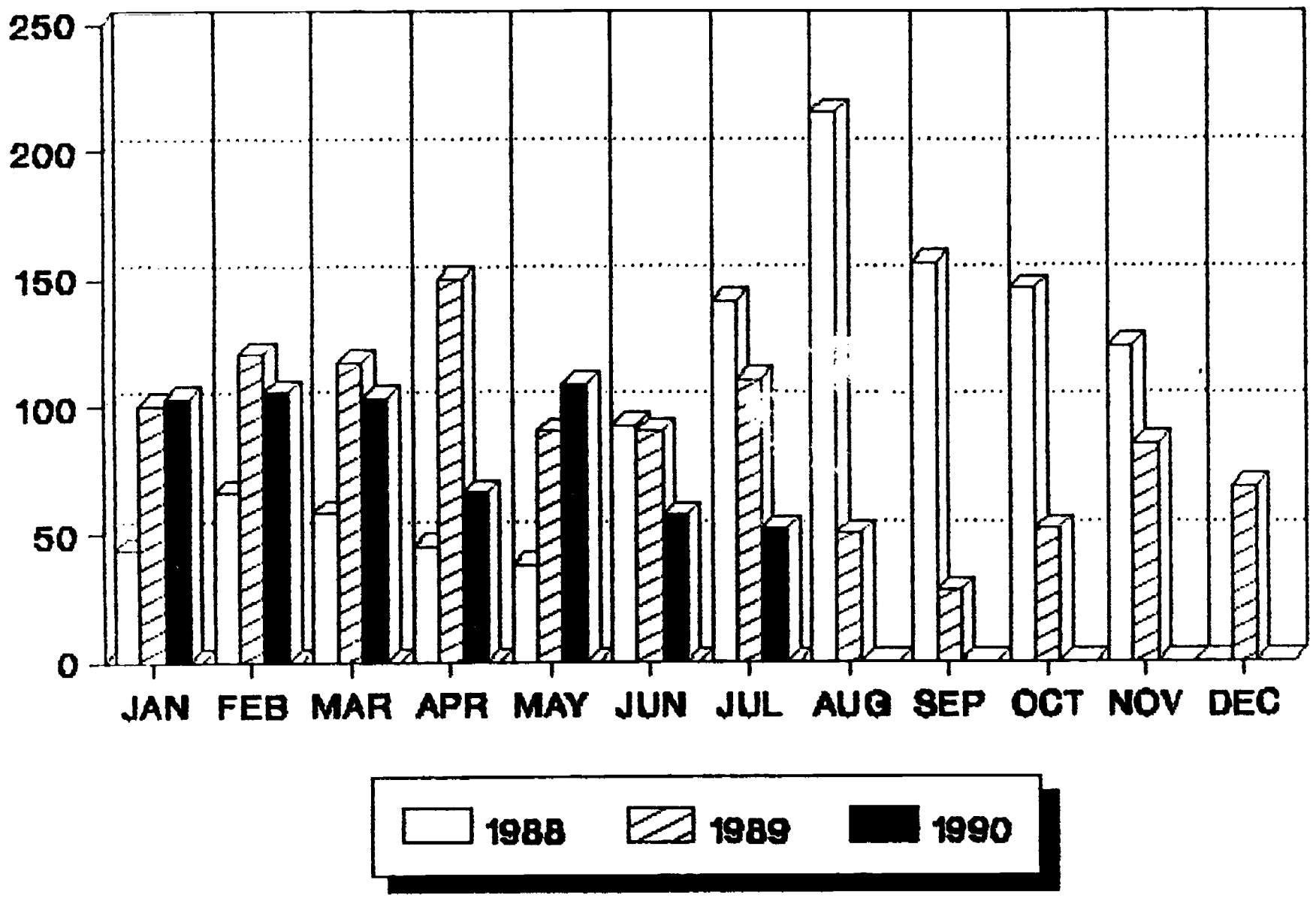
Surveyor's Summary: Seven respondents searched the DDTL. Respondents indicated that the database was incomplete and difficult to search. Several respondents stated they needed data more specific to their particular vocation.

Question 5: Would you like to make any other observations about the DDC or DDTL?

Reasons Mentioned	Times Mentioned
Good idea, just not complete yet	1

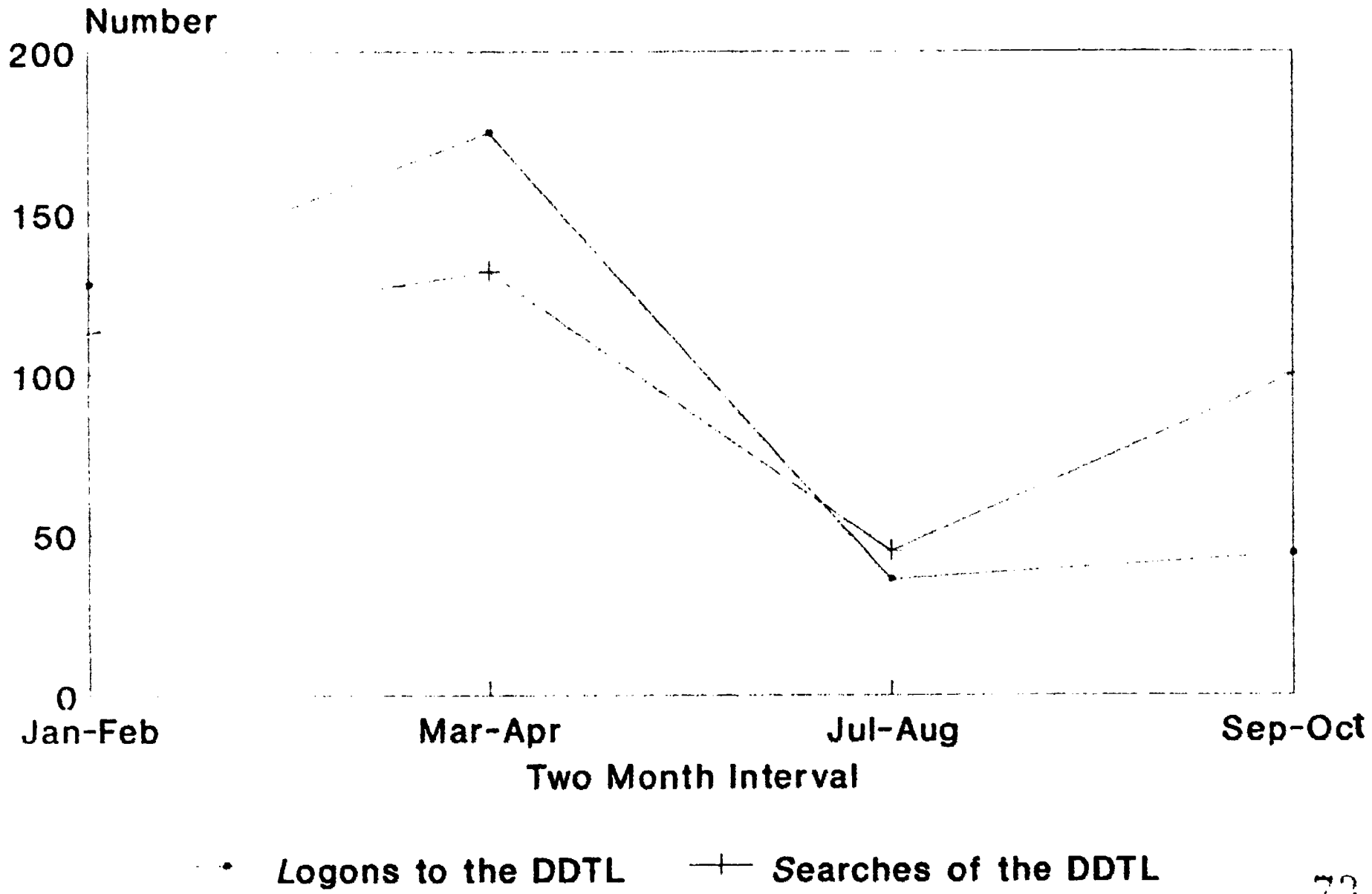
Surveyor's Summary: Only one respondent made an observation regarding the DDC/DDTL which is stated above in it's entirety.

Calls by Agencies Using ITSD Equipment



Source: DDC Logs

Appendix J: DDTL Use-1990



Appendix J: DDTL Use—1990

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Appendix K: Equipment Donated to ITSD

FY1

Rental of IBM typewriter

30M Seagate 238 hard drive (ACAD)

FY2

Ven-tel accoustic coupler modem

Sanyo 550-2 IBMPC clone with keyboard, monochrome monitor/cables, MS-DOS, Basic, Copylink, Wordstar, Calcstar

Northstar Advantage HD-5 CPU, Hayes Smartmodem, Infomanager software package, HDDS Software Package, Wordstar software package

Jayday 300 BPS modem and Hazeltine monitor model 1200

Incomm 2400 turbo modem

Hazeltine 1200 terminal and Anderson-Jacobson modem

20 Perkin Elmer 1251 terminals

4 light pens

Apple II+, Monotone monitor, 2 Disk Drives, CP/M cord (micropro), Hayes Micromodem, Joy stick input device, 2 paddles input device, external fan & surge protector, printer cable

Apple DOS & manuals

FY 3

Apple Wordstar, Visiterm, Visicalc, Misc games/software, Mega writer, 2 boxes of disks

InterTech Super Brain 2, 2 drives and monitor, CP/M and manuals (micropro)

2 Radio Shack Color CPUs, 300 BPS modem, 10 piece software pack, cables and connectors

Internal 1/2 card 300/1200 BPS Smarteam modem

Two daiseywheel printers

FY4

Apple II+ system

Apple IIe system

3 modems

External modem

IBM PC and monitor

TRS 80 Model III

TRS 80 Model IV

Highlights

Vol. 6, No. 4 · Austin, Texas November/December, 1988

ITSD Project
Arlington project links technology to service delivery

Like most second graders, Michelle Thompson is working hard to master the intricacies of spelling. Michelle's getting some extra help with her homework though, through the Integrating Technology into Service Delivery (ITSD) project, which operates from the University of Texas at Arlington.

Michelle was born with cerebral palsy. She has a seizure disorder and difficulty with language and fine motor control. She is in special education, and spends most of the day in a self-contained classroom, but participates in a regular education music class.

Michelle works with a computer in her classroom and also after school in her Easter Seal program to help her improve her expressive and receptive communication skills and also to make the physical work of writing less laborious for her. But because she didn't have a computer at home, it was difficult for her to practice what she'd learned at school. That's where ITSD comes in.

ITSD is funded by the Texas Rehabili-tation Commission, on behalf of the Texas Planning Council for Developmental Disabilities. For the past three years the project has worked to link technology, individuals, and agencies, in order to enhance the lives of people who have developmental disabilities in the Dallas/Ft. Worth area.

The project uses electronic networking to hook up old computers with new users. Individuals and companies that have computers they are replacing or no longer need, donate them to the project which refurbishes them and places them in the homes of people who have developmental disabilities. (Recently, American Airlines donated 25 computer terminals they no longer needed to the project).

Recycled hardware is just one aspect of ITSD's efforts to integrate technology into the lives of people with developmental disabilities.

The project has established an electronic bulletin board, the DD Connection. The bulletin board contains electronic mail, software, and the Developmental Disabilities Technology Library (DDTL). The DDTL is a database listing of technology-related agencies, experts, and publications. The DD Connection operates 24 hours a day and can send messages and files to approximately 3,000 other bulletin boards worldwide. The DD Connection is free except for standard long distance charges for those calling or outside the Dallas/Ft. Worth metroplex.

According to ITSD project director, Betts Hoover, people use the DD Connection in a variety of ways. Parents use it to meet other parents or professionals in order to share information and experiences. Some prefer the anonymity of the electronic system as a way of asking questions they are not yet comfortable asking in person. Professionals, particularly those who live in outlying areas, use the bulletin board to make and keep professional contacts.

Continued on page 4.

Michelle gets an assist with her homework from her home computer. Page 66

ITSD Project (cont'd)

And, one young man who lives in a nursing home in the Dallas area uses his computer as his link to the outside world; it has become his means for socializing and conversing with others.

Hoover says that electronic networking is just beginning to come into its own for the ITSD project. "There's a certain critical point you have to reach in electronic networking. Until you have about 200 people you don't have enough good information to share. You have to reach that critical point before you take off, but once you do it booms," she says.

The project's log-ins tripled in 1988. Currently the network has between 700-800 members and added 400 new members this summer alone.

The project has a number of other components. Each year project staff presents a series of workshops that introduce special education teachers, rehabilitation counselors, consumers, parents and others to the latest advances in rehabilitation technology. The project has also developed an evaluation of functional abilities through the Center for Advanced Rehabilitation Engineering (Human Performance Profile), as well as public domain software, which gives advice and information about an individual's ability to deal with his or her environment through assistive devices.

For Michelle, the computer she now uses to practice a spelling lesson at home may eventually become part of a series of assistive devices that will better enable her to participate fully in a regular classroom. Computers can help her practice and improve language skills They will enable her to copy material from the board without assistance at school and to print out her own homework at home. They can help her improve her memory and her music skills.

The assistive devices she's beginning to use now will enable her to become more independent, more productive and more integrated into her community. Put more simply, through the use of an assistive devices, Michelle will be better able to do what all the other kids do.

For more information about the ITSD project, contact Betts Hoover, ITSD, University of Texas at Arlington, Box 19129, Arlington, TX 76019. (817) 794-5030.

Appendix M: Workshop Attendance and Satisfaction

Date	Title	Site	Attendance	Personally worthwhile*	Professionally Significant**
6 Nov 86	Hands On Introduction To Technology, Part I—Augmentative Communication	INFOMART, Dallas	64	3.7	3.7
2 Dec 86	Hands On Introduction To Technology, Part II—Mobility	INFOMART, Dallas	41	4.0	4.1
8 Jan 87	Hands On Introduction To Technology, Part III—Environmental Controls	INFOMART, Dallas	27	4.6	4.7
14 Apr 87	Hands On Introduction To Technology, Part IV Sharing Resources Through Electronic Networks	INFOMART, Dallas	27	4.1	4.0
22 Oct 87	Accessing Technology: Matching Technology to Clients	Education Service Center, Richardson	29	3.5	3.8
20 Nov 87	Accessing Technology: Computer Technology for Employment	INFOMART, Dallas	37	4.2	4.3
17 Dec 87	Accessing Technology: Update on Training and Evaluation Aids	INFOMART, Dallas	46	4.0	4.0
20 Jan 88	Accessing Technology: Funding/System Change	Education Service, Richardson	46	3.8	3.8
28 Mar 88	Accessing Technology: Linking People Through Technology	UTA Academic Computing Lab, Arlington	21	3.9	4.1
22 Oct 88	Accessing Technology: Presentation of DDC/DDTL	Coalition of Texans with Disabilities Conference, El Paso	19	4.5	4.3
29-30 Nov 88	Assistive Technology Funding and New Legislation: Where Do We Go From Here?	Education Service Center, Houston	19	4.0	4.0
13-14 Jan 89	Accessing Technology: Rehab Technology Update /DDC—DDTL/Wheelchairs & Seating Systems	UT Health Science Center, San Antonio	61	4.7	4.6

** Evaluation Response Scale: 1 = Poor—5 = Excellent. The question asked was: Was the workshop worthwhile personally?*
*** Evaluation Response Scale: 1 = Poor—5 = Excellent. The question asked was: Was the workshop professionally and scientifically significant?*
Average number of participants: 36

Appendix N: Texas Assistive Technology Needs and Priorities

Functions /Needs	Source of Data							
	Survey Questions		Survey Comments		Public Forums		Statewide Task Force	
	Rank	Ave.	Rank	Pro*	Rank	Pro*	Rank	Ave.
Disseminate information on assistance/funding	1	4.71	6	22	6	39	1	2.8
Identify/coordinate policies/resources/services	2	4.70	4	35	5	53	2	2.7
Procedures for involvement of individuals	8	4.59	7	19	9	17	3	3.0
Training and technical assistance	5	4.64	5	34	3	61	4	3.3
Provide and pay for assistive technology/services	3	4.66	1	95	1	198	5	4.9
Support partnerships & cooperative initiatives	8	4.59	9	12	7	32	6	5.0
Conduct public awareness programs	6	4.63	2	40	2	70	7	5.9
Identify Individuals & ongoing needs evaluation	4	4.65	2	40	4	54	8	7.8
Provide assistance to organizations	6	4.63	8	14	10	7	9	7.9
Standards to insure qualified personnel	10	4.45	11	6	8	20	10	8.7
Compile & evaluate data relating to the program	na	na	10	11	11	6	11	10

Rank is where 1 is the highest priority.
Ave. = Average
* The Pro tally is based on the number of positive comments minus the number of negative comments.

PRIORITIZED NEEDS

PRIORITY 1: Disseminate information to the public on assistance and funding for devices and services.

PRIORITY 2: Identify and coordinate technology-related policies, resources and services.

PRIORITY 3: Establish procedures for active consumer involvement in the implementation of a statewide program.

PRIORITY 4: Provide training and technical assistance on devices and services to consumers and providers.

PRIORITY 5: Provide and pay for assistive technology and services.

PRIORITY 6: Support partnership and cooperative initiatives between the public and private sectors.

PRIORITY 7: Conduct public awareness programs on effectiveness and availability of devices and services.

PRIORITY 8: Provide assistance to statewide and community-based organizations.

PRIORITY 9: Identify individuals with disabilities and provide ongoing needs evaluation.

PRIORITY 10: Develop standards to ensure the availability of qualified personnel.

PRIORITY 11: Compile and evaluate appropriate data relating to the program.

Appendix P: DFW Area Survey on Technology Needs

DECEMBER, 1989

As part of an effort to encourage the development of new technology services in the Dallas/Ft. Worth Metroplex, the Integrating Technology Into Service Delivery Project conducted interviews of agencies and individuals and reviewed service request from files located at the Center for Computer Assistance to the Disabled. The results of the survey and file review are listed below.

Total individuals interviewed: 22
Total agencies interviewed: 19 *

SUMMARY OF GENERAL COMMENTS/NEEDS:

All interviews indicated an interest in the development of comprehensive computer assistive technology services within the Metroplex. For the most part agencies expressed interest in evaluation and training services for their clients. They were also interested in ongoing training for their staff and a site where different devices and software could be demonstrated prior to purchase.

The local independent school districts indicated a gap in services for parents purchasing equipment to be used in the home. The parents have requested assistance with installation and initial training. The local independent school districts also indicated some interest in a demonstration site and resource for trial of new software. Training for teachers is now being handled by the Regional Education Service Center but referral for training would be considered.

Local hospitals were interested in consultation for patients and referral upon dismissal, populations discussed were persons with spinal cord and head injuries. Local vocational rehabilitation agency personnel indicated interest in comprehensive services. One local business indicated that requests for information on specialty devices would occur on a sporadic basis.

A major barrier mentioned by several agencies was transportation. A large number of clients would benefit from training to prepare for jobs that could be performed from the home, but lacked transportation to training classes or workshops. A registry of experts to provide installation and training on site was recommended by several individuals.

A second barrier mentioned was access to information on computer assistive devices and access to funding resources for purchase of computers and assistive devices.

Listed below are services requested. Again, most requests were for services for clients, however, all agencies expressed interest in a mechanism to provide ongoing training for staff, a source for information and referral, and a demonstration site.

POTENTIAL REFERRALS FOR COMPUTER ASSISTIVE TECHNOLOGY SERVICES
(Numbers indicate referral for services)

	Evaluations	Installation	Training
Adults	55	20	50
Children	15	35	35