

Computer Use in Social Services Network

Networking: The Linking of People, Resources and Ideas

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About the Network

Computer Use in Social Services Network (CUSSN) is a nonprofit association of professionals interested in exchanging information and experiences on using computers in the human services. Members participate in the Network by:

- Sending materials for the CUSSN Newsletter, such as: member needs, interests, hardware/software use, activities, resources, ideas, experiences, computer applications, and events. Send either in printed or MSDOS format.
- Distributing Newsletters at workshops and conferences. (I will send newsletters to distribute or place on a resource table.)
- Holding local CUSSN meetings. CUSSN meetings in California, Baltimore and Israel have been successful.

Network Dues: \$15 individuals, \$25 institutions (payable in U.S. Funds). Contact Dick Schoech, Associate Professor, School of Social Work, The University of Texas at Arlington, Box 19129, Arlington, TX 76019.

The Newsletter is published approximately 4 times a year and is sent free to all network members. Back issues \$5 each.

The Disk Copy Service makes human services demos and shareware available to members for a small processing fee. See inside this newsletter, page 4 & 5 for details.

The Electronic Network (CUSSnet) establishes local bulletin boards, national and local mail and file transfer, downloading of public domain software, and access to numerous repositories of electronically available information on human service computing. CUSSnet builds on FIDONET, approximately 3000 microcomputer-based local bulletin boards across the U.S. and in 9 continents. Contact

your local computer store for a list of local FIDO/OPUS nodes. Communications are at 300-2400 baud, 8 data bits, 1 stop bit and no parity. Almost any computer or terminal and modem will work.

The Skills Bank allows members to locate or share specific knowledge, skills and experiences. Contact Gunther R. Geiss, Adelphi U., School of Social Work, Garden City, NY 11530.

The Software Clearinghouse offers a computerized inventory of commercial and public domain available human service software. Contact Cindy Richie, U. of Washington, School of Social Work, 4101 15th Ave. NE JH-30, Seattle, WA 98195.

Special Interest and Area Group are subgroups where significant networking is occurring.

- **Educators SIG**—contact Wallace Gingerich, School of Social Welfare, U of Wisconsin-Milwaukee, Milwaukee, WI 53201.
- **Hospital Social Services SIG**—write Mike King, Director of Social Work and Discharge Planning, Saint Francis Hospital, 100 Port Washington Blvd, Roslyn, NY 11576.
- **Baltimore, MD**, contact Bob Elkin, Professor, U of Maryland, School of Social Work and Community Planning, 525 W. Redwood Street, Baltimore, MD 21201
- **California**, James M. Gardner, Department of Developmental Services, Fairview State Hospital, 2501 Harbor Boulevard, Costa Mesa, CA 92626

See also country contacts listed on the back cover.

Editors' Notes by Walter LaMendola, Bryan Glastonbury, & Stuart Toole

Walter LaMendola is a Consultant, 1412 South Grant, Denver, CO 80210, Bryan Glastonbury is Head, Dept. of Social Work Studies, The University of Southampton, Southampton, U.K. SO9 5NH. Stuart Toole is Senior Lecturer, City of Birmingham Polytechnic, Dept. of Sociology & Applied Social Studies, Perry Barr, Birmingham, England B42 2SU

Introduction

It is now over one year since the HUSITA Conference took place, and this represents part one of the last of those papers and presentations which will be able to be published. In what seems to us, the editors, to be whirlwind fashion, we have worked as we promised to ensure that as many of the papers submitted for presentation at the conference would appear in print. In total, the number of printed pages which will have appeared is over eight hundred, representing about eighty percent of the HUSITA papers. It was and is our belief that the papers relate a compelling chronicle of the nature and times of information technology applications in the human services across the world. For those of you interested in reading some of the other papers, the following publications contain most of them.

Glastonbury, Bryan, Walter LaMendola, and Stuart Toole, eds. Information Technology and the Human Services. John Wiley and Sons, Ltd.: Chichester, England, 1988.

LaMendola, Walter, Bryan Glastonbury, and Stuart Toole, eds. A Casebook of Computer Applications in the Social and Human Services. The Haworth Press, Inc.; New York, 1989. This volume will also appear as Vol. 4, Nos. 1/2 of Computers in Human Services, 1989.

There have also been a few assorted papers which have appeared in journals both here and in Europe, but with this and a subsequent issue of the CUSSN newsletter, the 1987 corpus of work has now been laid down as a few more courses to the brickwork of human service information technology. And difficult, laborious brickwork it is!

These papers were selected for the CUSSN Newsletter because of what we judged to be their relevance to the widespread group that reads the Newsletter. For example, Bill Allbritten and Rosemarie Bogal-Allbritten are no strangers to CUSSN. They have been involved with CUSSN and computer use for a number of years, and Bill continues to be very active in the CUSSN Electronic Network. In fact, their paper is a useful primer on computer telecommunication services for the human service professional.

...the papers relate a compelling chronicle of the nature and times of information technology applications in the human services across the world.

Fritz Grundger discusses related network issues from a West German point of view. Internal computer networks are one of the topics of Dr. Grundger's exploration, as he discusses the impact of computer applications from an economist's point of view. As he points out, one of the impacts has been to redefine the need for middle management and clerical staff in human service organizations. As the human services move toward decentralization in West Ger-

many, Dr. Grundger predicts that internal networks will be replaced by external computer networks, often composed of staff working from their home terminals.

Karl-Erik Andersson analyses decentralization in the human services from the experience in Sweden. He points out that group communication and networking is of fundamental importance to the human services. As decentralization occurs, information strategy is apparently more critical. On the one hand, information strategy will guide technological development, but on the other hand, it is a vital tool for a more efficient and consumer oriented organization for human services.

The PROSOZ project in West Germany described by Dr. Hasenritter is an example of practical attempts to develop the type of information strategy Karl-Erik Andersson advocates. Efficiency and working conditions improvement are goals of the project, guided by the common decision making context of the workers. In order to support the use of the technology in decision making, the project has focused upon evolving user interfaces and software ergonomics, both reliant upon worker reaction and input.

Worker reaction and input are one of the structural building blocks for the software offered by ECHO Consulting Services and described by George Epstein. His article describes the ability of the software he has developed to support the case management function at a variety of levels. His software has been adopted in a wide variety of organizations across the United States, and may be the most widely used software of its type. Mr. Epstein discusses a few of the reports generated by the system and their utility for workers, organizations, and state planning agencies.

Hugh Grove, Frank Selto, and Don McCubbrey review reporting strategies as they relate to a model of information system effectiveness in the human services. Many of the rules they present, though widely articulated and taught now, are found to be violated in practice. Jean Harrod's article is a strong complement to the Grove piece. Comparing and contrasting these pieces is a telling exercise. Theory and practice are a long way apart, as Ms. Harrod describes in her discussion of the implementation of Child Abuse and Neglect information systems. Dr. Jerry Finn follows with a description of his human service organization computer survey in three North Carolina counties. From his article, we can perhaps begin to see the shortfall between theory and practice, in part, as a consequence of the local agency environment and the lack of training requirements.

John Gandy goes further in his analysis of eight social welfare organizations in a Canadian metropolitan area. Using Hasenfeld and English's taxonomy of human service organizations, Dr. Gandy finds significant and surprising results. More staff in people changing than people processing organizations felt there was no reason for concern about the introduction of computers in their work, and the concerns of both types of staff about the threats computerization poses to confidentiality were minimal! Two representative examples of ongoing human service information technology evolution are included. Rami Benbenishty reports on the impact of an information system on direct service workers, and a former star pupil of Walter LaMendola's, Carolyn Hughes, joins in a team description of the development of information technology utilization in a multidisciplinary human service setting. §

Services Available

Vendor/Consultant	Contact Person	Services
California		
Planet Press P.O. Box 3477 Newport Beach, CA 92663-3418	Anne Breuer (714) 650 5135	Consultants and developers for schools, group homes, residential facilities, and human service providers. Specialist software for Quality Assurance, Case Management, Behavior Management and Human Rights Documentation, Consent Decree Litigation Review, Adaptive Behavior assessments, School Psychologist Report Writing.
Florida		
Community Service Council of Broward County, Inc. 1300 South Andrews Avenue P.O. Box 22877 Fort Lauderdale, FL 33335	Carole L. Dowds CIE Programmer/Coordinator (305) 524-8371	A full range of consulting and technical support in the automation of Social and Human Services. Systems include Agency Inventory/Directory Production, Information & Referral, Client Case Management, Mental Health Client Tracking. Personal computer and minicomputer versions available.
Indiana		
Master Software Corp. 8604 Allisonville Rd., Suite 309, Indianapolis, IN 46250	Joan K. Boyer (317) 842-7020	Fund-Master development software features donor/prospect tracking, online inquiry to demographic and pledge/gift records, account selection capability, word processing interface, labels, campaign analysis, pledge processing, and more. Fund-Master runs on IBM PC's & compatibles, Data General Desktop and MV series. Single and multi-user versions are available.
New Hampshire		
ECHO Software Products Main Street, Center Conway, NH 03813	Loren Davis Director of Marketing (603) 447-5453	Complete Human Service Software Systems including client information and tracking, accounting, and fund raising.
New York		
King Associates, LTD. 215 Shoreward Drive Great Neck, NY 11021	Michael A. King, D.S.W. (516) 487-5995	Producers of AMIS - flexible off-the-shelf software for hospital social work and discharge planning departments. Customized programming are also available.
North Carolina		
National Collegiate Software Clearinghouse, School of Humanities & Social Sciences Box 8101, N. Carolina State U. Raleigh, NC 27695	G. David Garson Director (919) 737-3067 (919) 737-2468	A non-profit, educational, software service which distributes 240 low-cost programs for IBM format. Offerings include PC DataGraphics & Mapping (\$33) and Abnormal Behavior Tutorial (\$23). Write or call for a free catalog.
Pennsylvania		
Handisoft, 4025 Chestnut St., Philadelphia, PA 19104	John G. Vafeas, D.S.W. Consultant (215) 898-4933	Feasibility Studies; Training; Custom Designed Software, Sales of Popular Software & Hardware (own line of PC Clones); Networks: Sales, Installation and Support; and Hardware Maintenance.
Rhode Island		
Applied Innovations, Inc. South Kingstown Office Park Wakefield, RI 02879	(800) 272-2250 (401) 789-5081	A developer and manufacturer of numerous software programs designed to operate on popular microcomputers. The programs are fully supported, documented, and operational in hundreds of locations. Programs assist with Psychological Testing (e.g., MMPI), Office Management (e.g., billing/insurance forms), or Utilities (e.g., pop-up DSM-III-R info.)
Toronto, Canada		
Human Services Informatics Ltd. (HSI) 600 The East Mall, 2nd Floor Toronto, Ontario M9B 4B1 Canada	Jim Armstrong, Ph.D., President John MacNeil, M.S.W., V.P. & Sales/Marketing (416) 622-8890	Developers of specialized information management systems which enable human service agencies to manage caseloads, service transactions, human and financial resources. This integrated software package has a unique query ability and permits users to ensure quality care and contain costs, on a constant basis. Requirements: IBM or compatible 80286, Xtrieve. Compatible with SYSTAT and SPSS for more sophisticated statistical data analysis.

Service Listing Announcements: Interested vendors/consultants should send payment along with their description. Rates are as follows:
Under 15 words, \$18 per year. Under 30 words, \$28 per year. Under 45 words \$10 per issue or \$34 per year. Under 60 words, \$12 per issue or \$40 per year

Space Advertisements: Advertising space is available in the CUSS Newsletter at the following rates:

one eighth page in one issue = \$15	one half page in one issue = \$45	one full page in one issue = \$75
one fourth page in one issue = \$25	three fourths page in one issue = \$60	two full pages in one issue = \$120

Advertisers must furnish a copy ready ad. If the ad will be run for four issues, a 25% reduction in cost is granted.

Mailing labels: Mailing labels are available at the cost of 7 cents per label.

CUSSN Disk Copy Service

Definitions of software codes:

- [D] = Demo — Software that highlights a product and/or gives you the feeling of how the actual product operates.
- [F] = Freeware — Full working version; no restrictions on use.
- [L] = Limited Use Version — Lets you examine the product, but limitations prevent continued use.
- [U] = User Supported Shareware — Full working copy; you are expected to register and pay the vendor if you use it.
- IBM-PC = Will run on the IBM personal computer and compatibles.
- [HD] = Indicates a hard disk is required.
- [C] = Indicates a color monitor and color graphics card is required

Note: Disks are direct from the vendor and copied with vendor permission. Thus, disks are free of computer viruses.

New Disks since the Last Issue

CAPTAIN'S LOG (2 disks) — Cognitive Rehabilitation System [D][C][IBM]

Provides a demo of software designed to train basic cognitive functions including attention, concentration, memory, visual-motor, numeric concepts and reasoning skills. For use with individuals age 6+ with head injuries, learning disabilities, strokes, mental retardation or to facilitate early learning. It can also be used as a pre — post drug treatment assessment tool for attention deficit disorder.

DIS (1 disk) — Demo of client self-administered Diagnostic Interview Schedule from U. of Wisconsin [D] IBM-PC

The Diagnostic Interview Schedule (DIS) is a computerized structured interview used to obtain data required for most adult Axis I psychiatric diagnoses. This version of the DIS on this demo is designed so that the patient can take the interview with minimal assistance from the clinical staff.

Help-Software (1 disk) — Demo of self-help software for assertiveness, self-esteem and stress from CATSco [D] IBM-PC

This sampler acquaints you with three client administered self- help software programs. Help-Assert increases assertive communication. Help- Esteem enhances self-esteem. Help-Stress helps control and manage stress.

HSIS (3 disks) — Demos of general purpose human service information system from Echo Consulting, [D] IBM-PC

An agency customizable menu driven system which will collect, track and report client, service, and financial data (disk 1). It can be integrated with a clinic accounts receivable system (disk 2). Also available is a fund raising system which organizes mailing lists, tracks gifts & pledges, produces labels, index cards and personalized letters and many reports (disk 3). Order 1 or all 3 disks.

Stickey (1 disk) — One finger/stick program with keylock for people using a stick access device from C-CAD [U] IBM-PC

Allows someone using only one finger or a stick to better access the computer. Also contains PowerMenu from Brown Bag Software.

SuperSync (1 disk) — Demo for analyzing and managing teams in the workplace from SwixTech [D] (IBM-PC)

Helps team leaders and managers construct, print, analyze, graph and reports surveys regarding team-work.

Disks described in previous issues

Developmental Disabilities

AUGMENT (1 disk) — Information on augmentative communication readiness [F] IBM-PC (no copy charge)

McDSC (1 disk) Community Residential Services Demo MIS from Micro Decision Support Center [D] IBM-PC

DD Connection (1 disk) — Illustrates a Developmental Disabilities (OPUS) bulletin board [D] IBM-PC (no copy charge)

1-Finger (1 disk) — Handicapped Keyboard Enhancer from Trace Research & Developmental Center [F] IBM-PC

Education/training

AMS (1 disk) — Academic Merit System — Automates merit review process from WALMYR Publishing Co. [L] IBM-PC

BASIC Professor (1 disk) — An interactive BASIC tutorial from Eagle Software [U] IBM-PC

GRADES+ (1 disk) — Course grading program from Penguin Computing [D] IBM-PC

SCREE (1 disk) — Sequential Criterion Referenced Educ. Evaluation System from WALMYR Pub. Co. [L] IBM-PC

TAS (1 disk) — Teacher Assessment System from WALMYR Publishing Co. [L] IBM-PC

TUTOR.COM, (1 disk)(Ver 4.4) DOS Tutor from Computer Knowledge [U] IBM-PC

Health

AMIS (1 disk) – Hospital Social Work/Discharge Planning demo from King Associates Ltd. [D] IBM-PC

Medical Rehabilitation Manager (2 disks) – Demo from Easter Seal Society [D] IBM-PC {HD}

Vocational Rehabilitation Manager (1 disk) – Demo from Easter Seal Society [D] IBM-PC {HD}

Mental Health

Agency Simulation (1 disk) – Agency simulation source code & reports for Dec 10 [F] IBM-PC

CAS (4 disks)(Ver 5.2) – Clinical Assessment System from Walmyr Publishing [L] IBM-PC

Hamilton Depression Assessment (1 disk) – from Grant Fair [F] IBM-PC

MMPI (1 disk) MMPI interpretation demo from Applied Innovations [D] IBM-PC

PsyMed (2 disks) – Guide to psychotropic medications from Psych Soft Inc. [U] IBM-PC

Management

Bernie Cares (2 disks) – I&R demo from Central Referral Service, Inc. [D] IBM-PC {HD}

Community Services Locator (1 disk) – I&R demo from Pinkerton/Galewsky [D] (IBM-PC)

Donor Network (3 disks) – Shareware donation and pledge tracking system from A + M Software [U] (IBM-PC) {HD}

EZ-Forms (1 disk) – Forms generator and manager from EZX Corp. [U] IBM-PC

Fixed Asset Manager (2 disks) – Shareware Fixed asset system from A + M Software [U] (IBM-PC) {HD}

Fund Accountant (2 disks) – Shareware fund accounting system from A + M Software [U] (IBM-PC) {HD}

Fund Accounting (1 disk) – Demo from Executive Data Systems [D] IBM-PC

Fund Accounting Manager (2 disks) – Demo from Easter Seal Society [D] IBM-PC

HSS (1 disk) – General Ledger demo from Great Lakes Behavioral Research Institute [D] IBM-PC

In-Site Billing (1 disk) – Demo from Applied Innovations [D] IBM-PC

MIS Manager (2 disks) – Shareware computer inventory tracking system from A + M Software [U] (IBM-PC) {HD}

MPB (1 disk) – Multi-Provider Billing System demo from Applied Innovations [D] IBM-PC

Painless Accounting (3 disks) – Office accounting system from Painless Accounting [U] IBM-PC {HD}

Professionals' Billing System (2 disks) Clinical Practice Billing System from S. Shapse [U] IBM-PC {HD}

Volunteer Network (3 disks) – Shareware for tracking/scheduling volunteers from A + M Software [U] (IBM-PC) {HD}

Statistics

CRUNCH (1 disk) – Demo from Crunch Software Corp., [D] IBM-PC

SPPC (4 disks) – Stat Package for the Personal Computer (student edition) from WALMYR Publishing Co. [F] IBM PC

Welfare

Child Abuse (1 disk) Intake Prioritization Expert System demo from Dick Schoech [F] IBM-PC

Miscellaneous Packages and Utilities

Book Maker (1 disk) from WALMYR Publishing Co. [L] IBM-PC

Disk Protector (1 disk) from WALMYR Publishing Co. [L] IBM-PC

EXSYS (2 disks) Expert System Shell demo from EXSYS, Inc. [D] IBM-PC

Pen Pal (1 disk) from WALMYR Publishing Co. [L] IBM-PC

Help build the list. If you have found a human service oriented demo/freeware/shareware disk to be useful, please send it along. For every demo/freeware/shareware disk you send me, I will send you any two disks free.

Demo/shareware/freeware disk order form

To order, circle the disks requested. Enclose \$5 per disk (\$7 for non-members and overseas mail) to cover mailing and handling. Disks may be accompanied by vendor advertisements, order forms, etc. Proceeds from disk sales go towards furthering the CUSSN activities. Order from D. Schoech, CUSSN, UTA GSSW, POB 19129, Arlington, TX 76019-0129.

Number of software products = _____ ; Number of computer disks = _____

I enclose: (pay in U.S. dollars only) (Number of disks X \$5 or \$7 per disk =) _____

Name: _____

Mailing Address: _____

City: _____ State: _____ Postal Code: _____ Country: _____

Computer Telecommunications in Social Work Practice: An Overview, by William Allbritten & Rosemarie Bogal-Allbritten

William Allbritten is Director of the Counseling and Testing Center and Rosemarie Bogal-Allbritten is Associate Professor in the Division of Social Work at Murray State University, Murray, KY 42071.

Introduction

The use of personal computers in social service agencies for word processing, database management, and spreadsheet analysis is well documented, both in computer oriented magazines and general professional journals. There is a fourth area of personal computer application however, that has been used in business settings for some time, but has seen little use in social service agencies. This conclusion is based upon both anecdotal exchanges between the authors and other social work professionals as well as examining the Social Work Abstracts database for references. The latter search yielded only one reference to telecommunications and social work/service (Arcari, Betman: 1986) and none relating to the use of computer telecommunications by social service staff.

This article will examine the potential value of several established commercial remote database services as well as several specialty bulletin boards that are of interest to social service professionals.

Definitions

A personal computer is a small computer that is typically used by one person for one task at a time. Telecommunications refers to the use of a computer to send and receive data via telephone or other wired connection. A modem is a device to encode and decode information for telecommunication transmission and reception. Uploading refers to the transfer of data from the user to a remote location. Downloading refers to the reception of data from a remote site by the user. A remote database is a computer maintained body of information accessible by other computers.

The commercial remote databases and services to be examined in this article are those maintained by BRS Information Technologies (BRS After Dark), CompuServe, Dow-Jones News Service, and MCI mail. The following discussion of specific commercial databases should not be considered an endorsement of any particular database over a competitor: these are databases the authors have found of value in their work.

BRS After Dark

BRS After Dark is a subset of BRS Information Technologies, Incorporated, located in Latham, New York. BRS services are well known to professional librarians and have likely been used by social service staff for literature searches. The less expensive evening service makes available over sixty of the full BRS service databases for relatively inexpensive individual searches. Database availability includes medical, legal, educational, and general interest resources; however, these authors have found the ERIC Psychinfo, Social Sci-Search, Sociological Abstracts, Alcohol Use and Abuse, Catalyst Resources for Women, and Social Work

Abstracts databases of use. The following social service/science related databases are available on BRS After Dark as of this writing:

- AGELINE DATABASE (AARP)
- ABLEDATA - OF NARIC (ABLE)
- ARTS AND HUMANITIES SEARCH (AHCI)
- ABSTRACTS OF WORKING PAPERS IN ECONOMICS
- CATALYST RESOURCES FOR WOMEN (CRFW)
- DRUGINFO (DRSC)
- DRUGINFO AND ALCOHOL USE AND ABUSE (DRSC)
- ALCOHOL USE AND ABUSE (HAZE)
- HUD USER (HUDU)
- INTERAGENCY REHABILITATION RESEARCH (IRRI)
- LEGAL RESOURCE INDEX (LAWS)
- LANGUAGE & LANGUAGE BEHAVIOR ABSTRACTS
- FAMILY RESOURCES (NCFR)
- MENTAL MEASUREMENTS YEARBOOK (*MMYD)
- NATIONAL REHAB INFORMATION CTR. (NRIC)
- PUBLIC AFFAIRS INFORMATION SERVICE (PAIS)
- PSYCALERT (PSAL)
- PYSCINFO (PSYC)
- RELIGION INDEX (RELI)
- SOC PLANNING/POLICY & DEVELOPMENT ABSTRACTS
- SOCIAL SCISEARCH (SSCI)
- SOCIAL SCISEARCH - BACKFILE (SSCB)
- SOCIAL SCISEARCH (CONCATENATED FILE)(SSCZ)
- SOCIOLOGICAL ABSTRACTS (SOCA)
- SOCIAL WORK ABSTRACTS (SWAB)
- TOUR (SUBSET OF CABA) (TOUR)
- WORK FAMILY LIFE DATABASE (WFLD)
- WORD-MECKLER WORDS ON TAPE (WORD)

(Source: BRS After Dark, 1987)

A search can be conducted quickly resulting in an immediate printout of results being available. Advantages to using a personal computer to obtain access to bibliographic databases include speed, flexibility, and cost. Charges are a flat rate of \$12.00 per hour plus telephone charges. While direct comparisons to searches performed by libraries is difficult, the authors have found that three or four databases can be searched with, if available, over sixty references being obtained in a half hour period. Additional searches based upon findings from previous searches can easily be carried out. This contrasts with a recent library conducted search costing \$40 and yielding one citation, while an individual search in the same area of research yielded sixty plus references.

This contrasts with a recent library search costing \$40 and yielding one citation, while an individual search in the same area of research yielded sixty plus references.

Information can be obtained at various levels of detail, ranging from one line summations to full abstracts. The short summations will contain author and journal information, title, and date. A medium length summation with a three to four sentence abstract can also be obtained. Finally, a full-length abstract can be obtained if desired. A sample citation (the one aforementioned citation) follows.

AN ACCESSION NUMBER: 15293. 871.

AU AUTHOR/S: *Arcari-M-T. Betman-B-G

TI TITLE: *The deaf child in foster care.*

SO SOURCE: *Children Today*, 15(4): 17-21, 1986.

AD ADDRESS: *Social Work Program, Gallaudet College, Washington, D.C.

HC HARDCOPY: 23(1), 1987, No. 66.

DE DESCRIPTOR/S: *Foster-care: deaf children in. Children: deaf, in foster care. Deaf-the: in foster care.*

CC CLASSIFICATION CODE: FAMILY-AND-CHILD-WELFARE (CC2035).

PT PUBLICATION TYPE: JOURNAL (J).

AB Abstract are an estimated 4,000 to 5,000 children with hearing impairments in the care of social service agencies. Common issues that must be dealt with by foster families include the need to accommodate the child in the home, to establish ties in the deaf community, and to have a realistic recognition of the child's strengths and limitations. Because the deaf teenager in foster care deals with issues of security versus independence and of identity as they relate to the disability, there is an intensifying of the desire to be accepted and to appear as a hearing adolescent. Social workers must be attuned to factors that affect successful planning. Such factors include the implications of the degree of hearing loss and the validity of psychological and IQ testing methods. Workers must also be knowledgeable about the uses of sign language, interpreters, telecommunication devices for the deaf, and the like. Until child placement agencies begin to develop sensitivity to the plight of hearing-impaired foster children, it is unlikely that permanency planning for this population will exist.

Compuserve Information Service

Compuserve Information Service (CIS) is a multipurpose information service located in Columbus, Ohio, that provides several hundred services to users. Databases include business information, airline scheduling, health information, federal executive and legislative activity, forums dedicated to issues in rehabilitation and human sexuality, as well as general news information. Various newspapers and news services can also be studied. A search capability exists to narrow down the amount of material that must be read to obtain information on a specific subject. Several health related databases can be examined. These include information relating to technological advances in working with handicapped individuals, human sexuality, medical encyclopedias, as well as medical newsletters containing summaries of the latest research findings from federal and private sources. The health and mental health databases contain information regarding epidemiology, health trends, computer aids for the handicapped, counseling suggestions and interesting dialogue sections in which the user may correspond electronically with health and mental health professionals. Connect time for CIS varies between \$6.00 per hour and \$19.00 per hour, depending upon the time of day and at what modem speed the call is placed.

Dow-Jones News Service

Dow-Jones News Service (DJNS) is a well-known resource in business; it should be of interest to social service professionals. Among its databases are daily summaries of news, financial information, and legislative activity. As with Compuserve, a user can use keywords to identify articles or reports of interest in a specific area without having to scan manually an entire newspaper, newsletter, journal, or other document. Many newsletters, journals, and newspapers can be quickly searched using keywords.

MCI Mail

MCI Mail is a service of the MCI Communications Corporation that provides the user with a very fast, flexible, and secure method of sending written communications. Communication can be totally electronic, with both sender and

receiver viewing documents on their personal computers or terminals. Communication can also take place through printed copies of correspondence. The sender enters a document on a personal computer, transmits the document electronically via modem to MCI Mail, has it printed by MCI mail using a laser printer that can replicate letterhead and signatures, and it is then sent to the recipient at the recipient's address as a paper copy. Delivery can take place through local United States Postal Service delivery or courier delivery. In many metropolitan locations, delivery can be made in as little as four hours after transmission. An electronic receipt verifying delivery can be obtained by the sender.

This service can be of particular value in securing the timely delivery of a grant or research proposal prior to a deadline. Access to MCI Mail can be accomplished directly or through Dow Jones News Service.

Each of these services is accessible via modem communications over regular telephone lines and most urban areas have local numbers which can be used for access. Long distance lines must be used in other localities.

This service can be of particular value in securing the timely delivery of a grant or research proposal prior to a deadline.

Specialty Bulletin Boards

These four services are all commercial, but computer bulletin boards operated by individuals as a hobby or for professional purposes have been available for several years. Long the domain of the hobbyist, these boards are now of professional value to the social service worker. A group of mental health workers, hospitals, physicians, and other health care providers have formed a network of computer bulletin boards specializing in health issues. Several are primarily medical in nature; one board specializes in information for handicapped users.

Another network of boards involving social service professionals regularly communicates regarding federal policy issues, computer use in the social services, and on other topics. Computer User in the Social Services Network (CUSSN) consists of an interconnected group of bulletin boards in the United States, the United Kingdom, Holland, and most recently, Israel. A list of these boards and their access telephone numbers is frequently printed in the CUSSN Newsletter. Useful computer programs, such as a word processor for individuals with cerebral palsy, are exchanged and made available to local users. Like the medical network, these systems are able to exchange electronic mail, data files, and other information. The capability exists for users to post messages on one system and to have that message echoed to the other systems in the network. A sample list of files (documents) relating to the handicapped which are stored electronically on one such system follows:

LD1.TXT GROUPS DEALING WITH LEARNING DISABILITIES
SE1.TXT GROUPS AND PUBLICATIONS DEALING WITH SPECIAL EDUCATION
BO2.TXT JOURNALS ON TECHNOLOGY FOR SPECIAL EDUCATION TEACHERS
BO3.TXT BOOKS ON TECHNOLOGY FOR SPECIAL EDUCATION ADMINISTRATORS

BL1.TXT SPORTS ORGANIZATION FOR THE VISUALLY IM-
PAIRED
BL3.TXT ORGANIZATIONS AND SERVICES FOR THE VISION
IMPAIRED
BL4.TXT MAKING COMPUTERS ACCESSIBLE TO HANDICAP
CHILDREN
BL5.TXT LISTING OF BBS DEALING WITH THE PHYSICALLY
HANDICAPPED
BO1.TXT BOOKS ON MICROS AND THE NEEDS OF HAND-
ICAPPED USERS
LD2.TXT ANALYSIS OF PATTERNING FOR BRAIN DAMAGED
CHILDREN
LD3.TXT COGNITIVE REHAB AIDS VICTIMS OF HEAD IN-
JURIES
DF2.TXT ORGANIZATIONS OF AND FOR DEAF AND HEAR-
ING IMPAIRED
DF3.TXT GROUPS AND PUBLICATIONS FOR THE DEAF AND
HEARING IMPAIRED
BL2.TXT MICROCOMPUTER VOICE TECHNOLOGY FOR THE
VISION IMPAIRED
BBSHAND.TXT LIST OF BULLETIN BOARDS WITH HAND-
ICAPPED USER INFO
BRAININJ.TXT TREATMENT FOR BRAIN-INJURED
CHILDREN
C2E2.TXT VOICE CONTROLLED MICROCOMPUTER SYSTEM
COMPIND.TXT HOW COMPUTERS GIVE INDEPENDENCE TO
THE DISABLED
DYSLCOLL.NWS COLLEGE FOR DYSLIXICS
EYETYP.TXT INFORMATION ON DEVICE THAT TYPES BY
EYE MOVEMENT
HANDSCHO.TXT INFORMATION ON SCHOLARSHIPS FOR
THE HANDICAPPED
HANDINF.TXT EQUIPMENT, GROUPS, MAGAZINES,
MUSEUMS, OTHER INFO
HEXINF.W1 INFORMATION ON SPORTS AND SPOKES
MAGAZINE
HEXINF.TXT CATALOG OF HANDICAPPED EXCHANGE INFO
HEXINF.P INFORMATION FOR POLIO SURVIVORS
HEXINF.MP INFORMATION ON ACCESS GUIDES
H-KEY.ARC WORD PROCESSOR THAT REQUIRES ONLY ONE
FINGER OPERATION
TDD.ARC TTY EMULATOR FOR PC'S AND COMPATIBLES
JAN.TXT INFORMATION ON JOB ACCOMMODATION NET-
WORK
JOB.TXT SUCCESS STORY
SILENCE.TXT HOW COMPUTERS AIDED A DEAF WRITER
SPEDCAT.TXT CATALOG OF SPECIAL EDUCATION COM-
PUTER CATALOGS
TELEBR.TXT INFORMATION ON TELEBRILLER MACHINE
VOU.TXT INFORMATION ON VOICE SYNTHESIZERS
HANDICAP.NWS FREE NEWSLETTERS WITH INFORMATION
ON HANDICAPS
HDNC.TXT INFO ON HELEN KELLER NAT.CTR F/T
DEAF/BLIND
ABUSE.TXT INFORMATION ON REPORTING OF CHILD
ABUSE
SCHOLAR.TXT MORE INFORMATION ON HANDICAP
SCHOLARSHIPS
HELPLINE.TXT ASSOCIATIONS AND HELP PHONE NUMBERS
SPCHILD.TXT ARTICLE ABOUT SPECIAL NEEDS CHILDREN
HOUSING.TXT WARNING ABOUT AVAILABILITY OF AFFOR-
DABLE HOUSING
DYSLDIAG.TXT INFO ON EARLY DIAGNOSIS OF DYSLIXIA
BRAISENS.TXT UNWU USES OF BRAIN SENSOR TECHNOL-
OGY
BIRTDILE.TXT DILEMMA POSED BY INFANTS WITH
PROFOUND HANDICAPS
MOREBBS.TXT MORE HANDICAP SPECIALTY BBS'S
TRISTAN.TXT SAILING INSTRUCTION FOR HANDICAPPED
CHILDREN IN THAILAND

Not only are bulletin boards of value as an information resource to be used remotely, but the ease with which they may be set up and operated provides the social service staff with a new means of disseminating local information. A representative listing follows with access numbers to some of these boards.

Regardless of location, computer bulletin boards provide the capability to exchange messages, disseminate information, and to interactively involve the user in the development of information. Access cost is minimal or nonexistent and start up cost is low. However, access must be gained via a telephone directly to the bulletin board, necessitating in many instances, a long distance telephone call.

There are costs in using electronic information resources. First, computer equipment must be available to the user.

However, any computer or terminal can be used to obtain access to these services. A modem is also required and an attached printer recommended. A modem provides various levels of transmission speed and quality, with the price of the modem increasing as speed and quality increase. The commercial database services call have charges. Compuserve, for instance, ranges upwards from \$6.00 per hour, depending upon the time of day and the data exchange speed (baud rate) at which the connection is made. In rural areas, a long distance telephone call is often necessary. On the other hand, bulletin boards offer low or no cost access, with the exception of telephone costs.

The professional wishing to develop skills in techniques of computer telecommunications with remote databases can turn to several sources for help. A campus computer center may be able to help (*do not be disappointed if they cannot; many computer centers do not have expertise in personal computer usage*), or an academic department offering computer classes can be of assistance. Local computer clubs generally will have members familiar with telecommunications techniques. Professional meetings are providing more and more opportunities for product showcases in which social service workers can discuss services with the database vendors. The American Psychological Association meetings of recent years have provided such opportunities. The commercial database services often publish their own newsletters. Authors and presenters on this subject can also be consulted. Finally, the potential user is encouraged to become computer literate and to develop an interest in some of the many interesting journals related to computer usage such as BYTE, INCIDER, and PC.

The authors have attempted through this article to provide an overview of the wealth of resources available to social services staff through the use of electronic information services. As previously mentioned, specific services which have been cited are not being endorsed; they are simply representative of the types of services available. Readers are encouraged to develop local electronic information resources on their campuses through the use of computer bulletin boards. §

Computer Telecommunications Services

- Compuserve Information Services (800) 949-8990 (voice)*
- Dialog Information Services (800) 528-6060 ext. 415 (voice)
- Dow-Jones News Service (800) 257-5114

Bulletin Boards

- Fido/Murray State University, Murray, Kentucky (502) 762-3140 (computer) topic: health and handicap information
- Fido/St. Joseph's Hospital Phoenix, Arizona (602) 235-9635 (computer) topic: health information
- Developmental Disability Connection, Arlington, Texas, (817) 640-7880 (computer) topic: disabilities and technology

* (voice) refers to a regular speech telephone line. ** (computer) refers to a telephone line connected to a computer which must be used by a terminal or other computer.

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The Impact of Computer Application in the Human Services: An Economist's View by Dr. Fritz Grundger

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Introduction

The opinions on the computerization of our society vary between exaggerated hopes and expectations, innocent pleasure in the functioning of the electronic Jumping Jack and apocalyptic misgivings. On the one hand the engineers develop almost every day new and enlarged abilities for computers, and the sellers as well as the users discover more and more new applications. On the other hand we know comparatively little about what impact the information technology application will have or already has to our professional and private lives, for the individual, for certain groups and for the society as a whole.

As things are, the welfare sector ranks as the one public sector where the contradiction between needs and means finds its most flagrant expression. Hardly another sector reacts so sensitively to economic changes, which are reflected by the kind and volume of the services demanded, with only a small time lag followed by the adaptations of the budget to the changed economic situation.

The majority of the human services staff look at the economic side of their jobs with skepticism if not dislike; it is the task of the economist to help articulate their doubts as questions and try to answer them. For some the problem is concentrated on the one joint issue:

- Do computers help to save money?
- Do computers jeopardize the jobs?

The efficiency-by-unemployment issue undoubtedly is a crucial point, but does it really cover all aspects of our uneasiness? A more differentiated view will have to start with some simple considerations.

Definitions

The computer is a machine. Human services are personal social services and related health and educational services representing a very close relation between the person served, the recipient or client, and the service-delivering person, the professional servant or donor of the service. The introduction of a machine into such a relation must inevitably lead to changes in processes and results, in inputs and outputs, in human and institutional behavior.

Whether these changes are positive or negative ones depends on what side we look at the human services from: from society as a whole—from the human services management's point of view—or from the human servant's point of view—with the eyes of the client. Their expectations are quite different. The hopes of the ones are the misgivings of the others; one man's food is another man's poison.

They all expect a quality standard as high as possible, but, except the clients, who always expect a maximum no matter what it costs, support additional conditions which are often not only different but contradictory.

If we take only our special item, the cost and employment issue, we get the following three positions:

- Society as a whole expects the costs to be kept on a level as low as possible, but expects not only job security but even the creation of new jobs.
- The social welfare management, too, is anxious to keep the costs low, but mainly thinks of reducing the labor costs, i.e. of displacing labor by means of rationalization.
- The human servants are striving within the frame of given costs to raise the service quality, to reduce the work load and to avoid redundancies.

Impacts of computerization

Unfortunately, a pretty part of the impacts of computerization is either not yet conceivable or of an extent at present incalculable, so we'll have to call to our minds some trivial things which help to understand at least some tendencies:

The computer is a machine taking in information, storing, processing and giving it out on demand. It works largely automatically, guided and controlled by a program. This program is principally changeable and can be adapted to many tasks.

The computer can be useful

- where information is to be exchanged between separate persons or institutions,
- where a multitude of similar procedures or parts of them are to be repeated,
- where storage and sorting problems are to be solved, straining the capacity of human intelligence,
- where complex systems are to be handled, i.e. interconnections of information which are too intricate for human intelligence, especially when quick decisions are to be taken.

Mostly the introducing of computers in the service sector is being justified by arguments of "productivity," "efficiency," and "rationalization." At the bottom of it you will recognize the so-called Economic Principle. It is not only applied to economics but to any rational action and says: A given objective is to be achieved with the least means, respectively, with given means the highest degree of goal attainment is to be realized.

Supporting rationalization

Computer application can support rationalization in different ways:

1. By substitution within the service unit—as labor-capital substitution, replacing human labor by computers, i.e. replacing labor costs by hard and software costs,

- as labor-labor substitution, replacing manpower of a certain qualification by manpower with higher, lower or new qualification, full-time work by part-time work, male labor by female labor, etc.
- as in-house-outhouse substitution, replacing internal services by means of transferring them on to other institutions, e.g. from public agencies to private enterprise.

In the latter two cases the computer does not necessarily take over personal services but completes and supports them, thus facilitating or even making possible the substitution process.

2. By reorganizing the service unit for the purpose of shortening the walking time for servants and clients by computer aided decentralization,

- shortening the searching time for clients by computer aided information in the street (in supermarkets, city libraries, railway stations, and so on),
 - shortening the waiting time by accelerating the clerical work by means of word processing, computer aided calculation of social security claims or budget planning for heavily indebted clients.
3. By externalizing costs — here no longer services or parts of services are delegated against payment, but shifted to the client by incorporating him deeper into the production process (e.g. computer assisted self-therapy, input of personal data for social aid application by the client himself).

Institutional analysis

Talking of "human services" normally means the institutional aspect: we talk of a certain area, agency, department or job. But obviously it does not make much sense to talk of cost and employment impacts in a certain area before a more detailed analysis has been done. In reality the particular institutions (social welfare agencies, community health centers, hospitals and old-age homes) differ with regard to their structure and functions not only within the national framework, but also on the local level. One institution may be similar to another, both, however, will normally have not only a different case mix, but also a different activity mix. Therefore, the application of information technology to outwardly very similar institutions presumably will have quite different outcomes.

That is why we have got to start from a more technical aspect and with a closer inspection of the single services. Afterwards we may put together piece after piece to the mosaic picture of a certain human service unit. At least I will give you some idea of the approach if not the whole analytic process before giving you some of the results.

First of all, every human service institution provides three distinct service classes:

- the primary (or typical) services, for which the institution has been established,
- the secondary (or ancillary) services, which form base, background and frame of the primary services,
- the tertiary (or special) services, which give the specific stamp to the service institution.

The genuine human services are only to be found among the primary and tertiary services.

Standardization

The essential precondition for automation or computerization is a certain degree of standardization. The limits of rationalizing services lie in the high degree of individuality, being regarded as extremely high in the human services area. At a closer look this characterization, however, proves to be a too generalized one:

Standardization means the simplification and formalization of services and processes. It must not refer to the total service or to the total process, but can be restricted to parts of them. Fundamentally, every service can be split up into basic, supplementary, and adjustment components. The possibility of standardization normally only lies in the basic and supplementary components, seldom or never in the adjusting ones, whose very purpose is bridging the gap between the standard product and the individual needs and cir-

cumstances of the service recipient. According to the tripartition mentioned above the software houses supply single product portions, so called "modules," which can be applied in various combinations.

The difficulty now is how to define the limits of the adjustment part of a service. For this is meant to respond to the individuality of the client. But what does "individuality" stand for? It consists in the presumably unique ensemble of the recipient's properties. On one side they are of an objective nature and comprise the physical, psychical and mental properties and his environment. On the other side, they are subjective ones, including the client's expectations, wants and anxieties, hopes and fears, sympathies and antipathies.

Non-automatible areas

In his essay, "The Future of Human Service Information Technology," Walter LaMendola gives us a very helpful taxonomic framework to understand the relation between automation and human service work. He tries to draw a line between what may and what may not be automated for the sake of the "humanness" of the human services. But how far the non-automatible area of service-individuality reaches is less a matter of definition than of convention and conviction. How large the deviation of the standardized product from the individual demand is, will be determined from the donor within the legal and institutional norms, following his own criteria. "Individuality" as such does not exist for the human services. It all depends on the servant's interpretation: He can treat his client as a number or as an unequaled human being.

Going into details, LaMendola quotes among the non-automated human service work areas "the Use of...Humor." But, I know some people in the human services whose sense of humor is even below the built-in humor of some programmed dialogues. And the same applies to "Originality" and "Creativity" which are by no means an everyday good in the human services, but sometimes not only shown, but animated by a few software products.

*I know some people in the human services
whose sense of humor is even below the
built-in humor of some programmed
dialogues. And the same applies to
"Originality" and "Creativity"*

Assisting services

Before analyzing the impacts of computer application on single service categories, a general comment has to be inserted. In the service sector the costs for material and energy only form a small portion of the total production costs. The largest part, in the form of labor costs, can be regarded as information costs, i.e. the costs for searching, storing and processing of information. As far as information can be formalized, it can as well be managed by the computer. That is, to this degree of formalization from the technical point of view human working hours can be compensated by the input of adequate hard and software, personnel expenditures can be substituted by capital expenditures. The technological

development follows two converging trends: one towards structuring and thereby formalizing more and more information, the other towards constructing computer devices making less high demands on the formalization.

The first place among the computer-apt services is therefore taken by the information services in a narrower sense, including the writing services. Computers make more information available to more people. In virtually every place a decentralized computer set with its own software or the terminal of a mainframe computer can be located. It is now very unsensational to put up an interactive computer with social welfare information 24 hours a day in the street or a popular place. Additional information on social security claims will create more clients, more applicants, more counseling and interviewing work, hence a tendency towards more jobs, and, presumably, higher costs.

But, secondly, even the counseling and interviewing services can be accompanied and assisted by computers. They will normally not be a substitute for the human servant, but a support. Some people are reported to prefer answering the questions of the computer, even if the counseling person is present. Transference effects can be diminished; the social worker as a partner to the clients is sitting together with them in front of the monitor, interpreting things going on on the screen and helping to give the formally correct responses to the computer. Time-saving or any employment effects are not to be expected; the productivity effect is a quality one.

Thirdly, computer-assisted teaching can partially substitute a teacher's instruction, especially if continuous repetition and correction are necessary. Examples are: Grammar and vocabulary training, arithmetical problems in schools, instruction for self-therapy, etc. But it is rather doubtful whether developing of teachware can be successful on the long run and be more than an ephemeral event, nurtured by the home computer boom of the mid '80s. At any rate, labor saving effects are feasible, but only with unproportional high software costs, compared with the quality gain.

Fourthly, computer-assisted diagnostic services base partly on rather simple data-bases, partly on more or less sophisticated expert systems. The problem is that up till now, expert-systems in a layman's hand are often not only useless, but even risky, if in critical situations too much room is being left for interpretation. On the other hand, it can be doubted, whether an expert will rely on another expert's expertise. Therefore, mostly diagnoses based on expert-systems can be a valuable enrichment and support to an expert's work if conceptualized as kind of an electronic checklist; no more and no less. It may then rather be a quality-improving but no time or labor-saving medium.

Fifthly, similar effects are to be expected with computer-assisted care and therapy, but their rationalization effects will be rather in quality, i.e. more security, more exactness, more deepening of the treatment. Anyway, that's true as long as the personnel/patient ratio remains unchanged; any staff reduction will, as a loss of "humanness," tend to a quality reduction.

Impact of networks

Let me now come to the more practical part of the problem. There is, to begin with, a study of Frenzel and Schubert who have analyzed the impact of internal networks on produc-

tivity and costs of commercial services. Here they find confirmed the experience that the installation of networks primarily affects the work of the middle management up to the point of rendering it redundant. Integrated electronic networks allow a largely hierarchy-independent working. The exchange of information now can take place directly between the top management and the shop floor, no human intermediary needed. With that the essential function of the middle management, the condensation and distribution of information, is canceled.

But there are not only the members of the middle management whose jobs are endangered by internal networks. Another group having to fear for their jobs are the less qualified clerical and administrative services: the people in the filing department, the pure typists and the office helps.

The exchange of information now can take place directly between the top management and the shop floor, no human intermediary needed. With that the essential function of the middle management, the condensation and distribution of information, is canceled.

The productivity effects of single activities have been measured in a study of the German Airlines Lufthansa. After having installed an Ethernet-system, the highest score measured was 90% with the paperwork-distribution, followed with 60% scored on the field of graphics, analyses and calculations, and 50% with filing. As these activities do not cover the whole time-budget, the average productivity progress is considerably lower, namely 8.4% in the group of experts (professionals) and 20% on the level of secretaries (typists). These values correspond to findings in the U.S., which brought about figures between 10 and 15 percent.

However, these results have not been reached from the start. The period observed covers the time between the first installation-connected with often relatively high losses, not only in monetary terms but in productivity as well-and the trouble-free running of the network. In general, final judgment on the efficiency of internal networks can only be given after considering a period of at least 5 to 7 years.

Impact in social welfare

In contrast to these observations in the commercial service sector another study (Armanski et al.) concentrated on the automation impacts in the social welfare offices of two German cities. In both cases centralized computer systems should improve the subsistence-benefit route work. In one city the central authority expected a clear rationalization effect, i.e. personnel economies and tightening of the work flow. The social agency on the other hand hoped for relief of the mass work load and for improved client care.

The statement of the agency's staff council gives a somewhat sobering judgment. On balance, instead of work facilitation or labor saving only a work-shifting was noticed. As was conceded, the mass routine work actually had diminished, but the work flow had been condensed, so that the pressure of scheduled work had perceptibly increased.

In the other city the automated process had brought about changes in the work flow which the staff majority regarded as work complication and additional work. Faulty programming led to a large number of errors in the books and extensive corrections. The rate of errors rose from 2 to 40%.

The consequences of these observations can be seen in three requirements for efficient network investments:

- Firstly, planning and continuous control must be done by experts both in data processing and organization in order to avoid and early identify undesired computerization impacts.
- Secondly, the planning has to recognize the consequences for the staff appointment scheme.
- Thirdly, early and comprehensive information and training of the staff is an essential precondition for successful network operating.

Future trends

In the last part some future trends of the cost and employment development, as can be seen by now, shall be given: On the short run, i.e. till the end of the '80s, all areas where computer-assistance can be useful will be recognized and defined. The tendency towards the personal computer as key instrument for decentralized data processing will continue. It will lead to individual facilitation of work, mainly in the clerical services, but not to an essential rationalization effect on the cost and employment side. That has to do with the long starting time of computer systems. Economies in the short run are only realized where networks, internal or external, can be brought to their full functioning.

Networks, optimally installed and optimally utilized will pass their break even point, i.e. where total savings and productivity gains exceed the total costs, not before 1990 if started in 1985. For some authorities and city governments that means rather a long waterless track to travel; it will take all their patience to wait until then and to learn, whether the computer investment was successful or not. But all sub-optimal plants will not reach this point until the mid '90s. And not so small a part of plants will never do, but prematurely or too late switch to an even higher technology and start into the heroic adventure once more.

Over the medium term, till the end of the century, a much improved technology will be available, responding to the most frequent criticism. Therefore, the hardware will obtain a higher storage capacity, a higher processing speed, and an easier operating. By the end of the century the software supply will give more reliability, more specialization, fail-proof methods of adjustment and updating. Moreover, the last decade of the century will be a period of "expert systems" and "artificial intelligence" marketing. But these catchwords have aroused very high expectations, so that even software houses of good standing will be induced by their competitors to put programs on the market which cannot fill the bill. For a long time it will be a cost saving advice to leave the choice of an expert system to someone who is an expert in the special field. However, an effective support for accelerating and improving decisions on all levels of the human services will come from the extension and utilization of external data bases.

On the long run the prognosis of cost and employment impacts is extremely difficult, as we have to take into account not only changes in computer technology, but also in society,

which will influence both supply and demand of the human services, and we must be prepared to a growing contradiction of the productivity objectives and the wants and needs of the clientele aiming at greater diversification and individualization of the social services by means of the human services. Part of the structural changes in a post-modern society will, if not be caused so at least be facilitated by the application of computers and information technology as a whole.

Already now the human services tend towards more decentralization. At the turn of the century the institutional spectrum will range from field agencies, interconnected by an external network, to the total abolishment of office based human service work, replaced by the home based telework of the servants. Meals on Wheels will be followed by computers and other technical equipment on wheels, and the social agency will be no longer associated with a building, but remains a pure organizational idea — the grin without a cat.

At the turn of the century the institutional spectrum will range from field agencies, interconnected by an external network, to the total abolishment of office based human service work, replaced by the home based telework of the servants.

Summary

As for the cost and employment aspect the tasks of the human services will grow both in volume and diversity. But they are supposed to profit from computer application and information technology in general in a double sense: On optimal conditions cost-saving effects can be realized with the material services, thus setting free resources needed for extending and improving the personal services. And computers are able to give technical support to the personal services. The adequate integration and use of computers may lead the human services to growing quality and more jobs. These objectives are attainable at reasonable costs not only in spite of but also because of the application of computers to the social services as a total. §

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Human Services & Information technology in Swedish local authorities — experiences and developments, by Karl-Erik B. Andersson

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Introduction

Swedish local authorities play an important role in delivering human services. This area was long without support of information-technology. But with the introduction of database technology and computer networks in the end of the 1970s the development started for human services. Another important consequence of expanded computerization is a greater capability to monitor efficiency, goal attainment and economy. A further interesting development was the move from handling figures and statistics to use office information systems (including word processing and graphics).

New social information systems and applications could now aid in the placement of children in day nurseries, placement of pupils and teachers within the school system, etc. An important advance was the development of systems for planning.

The national economy and the human services

Human services expanded rapidly at the communal level in the 1960s and the 1970s. From 1960 to 1972 the economic growth in Sweden was constantly high. An increasing proportion of the national income was allocated to the public sector and especially to the communal sector for human services. In the 1960s the reforms of the school system and a larger number of pupils increased costs of the educational sector.

After 1972 (the first oil crisis) the economic growth stagnated in Sweden. But the public sector went on to take a bigger share of the national income. It meant higher taxes but not enough to cover all public expenditures.

The expansion of child care was now a feature of the development. Strong political wills demanded more day nurseries and more personnel resources for that sector.

Another development is the allocation of more resources for the care of the aged people. The number of old people grows in Sweden rapidly. The Swedish economy ran into problems during the 1970s. The state w/+ budget deficit grew enormously. From 1982 it has been a political and governmental goal to reduce the budget deficit. The state grants to local authorities have relatively been reduced. The tax base will not grow as fast as the communal expenditure. The slow real income growth does not allow increased communal taxes. National government and local governments are now looking for solutions, which can reduce costs and increase efficiency.

Organizational Problems

The rapid expansion of the human services caused an uncontrolled organizational growth and bureaucratization. The functional and sector-based organization is dominating, but this rigid form of departments in the communes, e.g., school department, social department, and leisure time department, etc., has been questioned.

The first reaction came from some popular movements in the political parties. Citizen participation and more democracy were demanded.

The second reaction came from people, who wanted to reduce the ever increasing costs. Over bureaucratization and rigid forms of administration which often characterizes the great functional organization means unnecessary costs.

Increased productivity and less expensive alternatives are requested. Cooperatives, privatization and competition within the public sector are sometimes seen as alternatives.

Decentralization and reorganization of the communal organization have been used as means to reduce overhead costs and increase citizen participation.

Decentralization

Decentralization can be seen as a tool to make human services more efficient.

Two ways of decentralization have appeared in Swedish local authorities. The first way is a political decentralization. Local authorities will be organized according to geographical principles, where each district has a political council. This type of consumer oriented organization also integrates the human services at the local level. The organizational middle levels can be reduced to a minimum. The administrative costs can in the long run be reduced. Information technology can here play an important role.

The second way of decentralization is "an administrative decentralization." The sector-based organization will not be changed. But as much power as possible will be decentralized to the lowest possible level, e.g., work teams, nurseries, schools, etc. The goal is to support and encourage public entrepreneurship. Even here it will be possible to reduce middle administrative levels and shorten the ways between the communal level and the local level.

The utility of these systems has been assessed and data show a benefit/cost ratio of 4. The gains are found in a more efficient (productive) administration and in better utilization of resources.

Information system and human services

Interactive and database oriented systems are used for school administration, child care administration, administration of care for the aged people, etc. The utility of these systems has been assessed and data show a benefit/cost ratio of 4. The gains are found w/+ in a more efficient (productive) administration and in better utilization of

resources. All these systems are connected to a common resident register.

In that way it is possible to avoid double recording and save time. The systems are also in some way integrated with personal administration (payroll), accounting and financial system. Originally the systems were developed for mainframes but today some of the systems are available on PCs or are under the concept of distributed ADP.

Developments of decision-support

Until now the main applications have been used to make administration of human services more efficient. Data are created in the operations of the departments. And these data can be aggregated to information for those who are responsible for managing human services.

But local authorities have discovered that information is a resource in itself.

Information technology and decentralization

The following developments of information technology will have a great impact on the possibilities to decentralize.

- electronic mail and electronic conferencing
- decision support system
- experimental design of new base systems
- access to information banks.

In the near future some other possibilities will be discussed.

- computer-based learning systems
- expert systems
- electronic mail and electronic conferencing

Group communication and networking is of fundamental importance for human services. With an electronic conferencing system it is possible to make the instrumental and social communication more efficient. The independence of time, place and number of participants means that the human services can be organized, e.g., in a more consumer-oriented way.

The independence of time, place and number of participants means that the human services can be organized, e.g., in a more consumer-oriented way.

Decision support systems

Information can be a resource in itself. Some data, which are created in operational activities, can be aggregated to information for those who are responsible for managing human services.

By decision support system we mean a system which can help the decision maker to make decisions. w/+

Such a system has to consist of the following parts:

- Information-retrieval (Aggregated data and information)
- What happens if? Calculation and simulation.

- Access to external information banks.
- Electronic mail and conferencing.

Experimental design of new base systems

With the introduction of fourth generation language it has been possible to organize systems development in a more democratic way. In a decentralized organization it is essential with a close cooperation between the systems analyst and the end-user. Flexibility and ease to change are very important.

Future oriented systems

Computer supported education and expert systems open new horizons. The critical factor is not information, but "knowledge". An important part of decision making is problem solving. In the future we will probably see a combination of decision support systems and expert systems. Today it would be possible to start with computer supported education and in combination with decision support systems. This will be a natural way to introduce expert systems.

The critical factor is not information, but "knowledge".

Integration of management & information strategy

An information strategy, which is based on managerial or political goals, is seldom found.

Traditionally the information technologists are living their own lives and rather isolated from managerial demands. But with the economic background in mind it will be necessary to use information technology as a tool to find a more efficient and consumer oriented organization for human services. Therefore, the information strategy has to be part of human service management strategy. Perhaps it will be a rapid and accelerated process of transformation for human services during the next five years. Political and economic factors in Sweden show that it is necessary to increase efficiency and slow down cost development for human services.

In the same time the citizens demand higher quality of human services. Information technology can perhaps contribute to the solution of both cheaper and more qualitative human services. §

...with the economic background in mind it will be necessary to use information technology as a tool to find a more efficient and consumer oriented organization for human services.

Personal computer in the field of social administration: The PROSOZ-project by Prof Dr. Karl-Heinrich Hasenritter

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Introduction

The PROSOZ-project deals with the implementation, of a personal computer aided system for the application of the West German social welfare act in four local government units (Bremen, Dreieich, Herten, Untermosel) and in one county (Mayen-Hoblenz).

The project participants do not intend to implement an isolated change in data processing. They develop an integrated concept to improve the quality of human work. This includes issues like organization, qualification, participation, client orientation of social administration, working conditions, hardware and software ergonomics, economic efficiency.

The main targets of this project are:

- Improvement of working conditions
- Client orientation
- Economic efficiency

The project participants do not intend to implement an isolated change in data processing. They develop an integrated concept to improve the quality of human work.

The project is sponsored by the West German Ministry for Scientific Research and Technology (project fund: humanization of work). Several universities and colleges are engaged as advisers in the processes of organization development and software development.

The project team at the Institute for Public Administration in Hagen developed a software prototype, called PROSOZ, to aid the application of the German social welfare act. In a process of rapid prototyping this system is being adapted to the needs and requirements of end users in the local government units by the Hagen project team.

Targets of the software development process and their integration in the PROSOZ system

The main question for software development in the field of social administration and in other areas is: What should be done by man and what by machine?

The possible answer should be analyzed very thoroughly.

In the PROSOZ project it was at first necessary to get profound information about the tasks to be fulfilled, and the activities to be done. In the next step targets and evaluation criteria were developed to define the functions of man and machine.

We did not accept Tayloristic ways of thinking, which lead to a high degree in the division of labor, but preferred the

horizontal and vertical integration of different tasks and activities on one working place.

The main question for software development in the field of social administration and in other areas is: What should be done by man and what by machine?

Support of decisions, according to law

The West German social welfare act includes complex legal instructions. On principle this legal system could be presented to the deciding officer in a computer directed dialogue. During this dialogue questions could be answered with "Yes" or "No." Compared with the mental abilities of human beings a computer and a computer directed dialogue represent a much less flexible system. With regard to the efficiency of our system we integrated only such legal questions in the dialogue, which must be answered in routine cases.

A computer is not a useful instrument to support difficult mental operations. The officer has to judge if his client is a trustworthy man. He has to judge if a concrete case can be subsumed under the abstract legal instructions. Such decision processes need the application of criteria, which must fit to a singular situation. A computer program allows only schematic decision making.

The PROSOZ Program supports the application of rules only in such cases, where the association of personal dates to these rules allow only one correct answer (Examples: If the age of the child is 7, then...if the client is a woman, then ...).

With regard to the efficiency of our system we integrated only such legal questions in the dialogue, which must be answered in routine cases. A computer is not a useful instrument to support difficult mental operations.

We integrated a comfortable help and information system in the PROSOZ Program, which supports the end user, to get special information about legal instructions, jurisdiction and so on. The user gets this information exactly at that point of work, where he needs help. The system can be extended by the user himself.

Support of efficiency

On principle we distinguish psychomotoric, cognitive and affective labor demands.

The transfer of functions from man to machine affects especially psychomotoric and cognitive demands. The use of machines leads to more efficiency in sectors, where the machine is a suitable tool, to execute tasks more rapid and more reliable.

- Computing is done by the machine, because computing with the machine is more rapid and more reliable.
- In the traditional mode of manual labor in social administration the officer types or writes the same personal dates many times, for example, name and address of the client. Functions are divided between of-

ficers and typists. The division of labor is time consuming, because one needs time for transport, control and correction. With the use of personal computer dates, which have been collected once, can be reproduced automatically on the monitor and on the printer as often as they are needed. Typing is concentrated on one person.

- We took into consideration that the operating procedures in many computer programs are not comfortable enough, especially for computer illiterates. End users lose a lot of time when they don't know what to do now or next. The integration of software ergonomic principles in a program is an important precondition for efficiency.

Improvement of working conditions

Reduction of routine functions: The results of our interviews in several administrations show that officers in West German social administration complain about a lot of routine functions, which are time consuming and boring like computing, data collection and processing, control of typewriting and administration of files. These routine functions are substantially reduced.

Job Enrichment: The reduction of routine functions enables higher time budgets for functions like

- examination of legal instructions,
- consulting of clients.

The concentration on such functions leads to job enrichment.

Job Enlargement: The PROSOZ program covers all main functions in the application of West German social welfare act.

Difficult functions, which are executed now by higher levels in the social administration and by specialized test units will be executed by the officer level in the future. The result is a reduction of vertical and horizontal labor division.

Freedom of action: An officer in social administration is bound to the legal instructions. Nevertheless the West German social welfare act gives much freedom for individual action. This freedom of action could be reduced through a computer program.

With regard to the logical structure of the program we paid attention not to reduce this freedom of action. On the contrary, the program indicates possible alternative actions.

Ergonomics of software: A main problem in the West German experience is the fact that many programs in public administration are not sufficiently adapted to the special conditions of human work and to the experiences, abilities and skills of their users.

A main problem in the West German experience is the fact that many programs in public administration are not sufficiently adapted to the special conditions of human work and to the experiences, abilities and skills of their users.

Empirical studies show that this can lead to a heavy burden and may cause illnesses. Therefore in our project special emphasis is put on software ergonomics.

A program should be self explaining.

In the PROSOZ program the user gets on his screen the following useful information:

- It is shown in which actual part of the program the user is working.
- It is shown which kind of input is expected
- It is shown how the user can leave the mask or the actual part of the program.
- It is shown which key designations are active.

Key designations have the same function all over the program. With key designation F7 the user can choose a help for his actual part of work.

Learning time to operate the system is about one day.

The user can direct the dialogue, depending on his level of experience with the system.

On principle the user can determine the flow of work.

A less trained user probably uses the menu choices. A trained user can work on the command level. With short commands the user can reach separate parts of the program.

Besides there are several possibilities to direct the dialogue:

- F1 finishes the PROSOZ program
- F2 makes it possible to interrupt the work with the actual case
- F3 causes a leap to a higher menu level
- F5 causes a leap to the highest menu level
- F6 causes a leap to the part of the program which has been used just before
- F9 this makes it possible to get the most important information about the actual case.

The system is tolerant with regard to most operating faults.

The program must be adapted to the main functions of an officer and to the typical flow of work.

The main function of the program is to support the application of the West German social welfare act:

- Collection of personal dates of the clients
- Examination of the legal instructions in a dialogue
- Examination and calculation of requirements and income
- Printing of filled application forms, documents and so on.

Besides the PROSOZ system supports the execution of typical bureau functions:

- Word processing
- Administration of dates
- Statistics
- Electronic calculation

These functions are integrated in the PROSOZ program.

The window technique is used to get information from other files and to transfer parts of this information in the actual input field. For example, you can transfer account numbers from a file in which account numbers are deposited.

Last but not least there is a special part in the program where even an inexperienced user can adapt the program to some extent to local and personal needs.

Thus input activities are reduced and the memory is relieved. The user can configure error messages, help texts, local parameters, files with information about bank data, health insurance, etc.

The process of organization and software development in our project will go on until 1989. §

Case Management Information: Local, Regional and Statewide systems by George Epstein

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Purpose

This paper is intended to summarize the impact of implementing client information systems in individual developmental service agencies and on state service systems with a primary focus on case management services. While the specifics may vary, other human services agencies may utilize this system in similar ways. These include mental health, elder and children services, substance abuse agencies, and others.

Method

Echo Consulting Services has implemented complete information systems at mental retardation, developmental disability, and rehabilitation agencies throughout the United States. This includes statewide systems where summarized data is transferred magnetically to the regional and/or state central office level. This paper reviews uses of information at the individual case manager level, in supervision of case management teams, in management of agencies, and in oversight of agencies by state office staff. In particular, the impact of provision of services to clients by specified target dates is discussed with additional analysis of the impact of documenting unmet needs on agency funding and resource allocation.

Developmental disability agencies including providers of day program, vocational, residential, case management, information and referral or other services have a common core of client data reporting requirements. They also share a desire to minimize the clerical burden on direct service and supervisory staff for record maintenance and service plan development and monitoring. In addition, there is often a desire to collect information on a regional or statewide basis as a means of providing: program accountability, funding source statistical reports, tracking of deinstitutionalized clients, sharing information among providers, quality assurance and accreditation, etc.

In the paragraphs that follow, Echo's Human Service Information System (HSIS) database design is described, as are the general reporting capabilities of the HSIS. Normally, some customization of database elements and specific reports are necessary for each state and agency type in which it is implemented.

Flow chart narrative

The attached flow chart shows the general file design of the client database Echo developed to meet the needs described above. The seven major files displayed in the central column of the chart form the core of the system. The following paragraphs briefly discuss the purpose of each file. It is essential to remember that all files are integrated so that, for example, clinical characteristics of clients may be tied to "events" or client progress.

- The Intake and Clinical files contain relatively static information recording the demographic and diagnos-

tic/assessment data on each client. One record per client would exist in each of these files.

- The Client Movement file tracks the individual's enrollment in various agency programs, and movement over time through those programs. Typically, multiple entries tracking client movement over a period of years would be maintained in this file. This data is ideal for planning purposes in that waiting list, enrollment, and even projected services for a client may all be maintained. Reports showing existing enrollments, waiting lists, unmet needs, and overall progress through program levels may be generated.
- The Referral file tracks use by clients of specialized services, whether for assessment or treatment, and whether provided by the agency or an external source. Normally, following recommendation for a referral, the information would be entered into the system and used as a "tickler" for the case manager or other responsible staff member. Upon completion of the service of referral, the confirming information will be entered into the system. Many entries per client may be maintained in this file. This function will be utilized heavily by case managers responsible for monitoring services to clients. It is designed to aid their ability to insure that specified services are received, to monitor costs of services, and to aid administrators in determining overall compliance with individualized plans.
- The Even file is a general purpose device for keeping track of significant events of any type as defined by the agency. Some uses would include: incident reporting, behavioral events, use of seclusion, staff training, absenteeism from enrolled programs, etc.
- The Assessment file retains the initial and most recent client assessments based upon the categories in the Objective Menu file. This allows long-term analysis of client progress and overall level of functioning based upon the criteria established for the specific client population.
- The Individualized Program Plan (IPP) file contains each client's objective as selected from an open-ended menu of goals/objectives (Objective Menu), and it contains information allowing the tracking of client progress towards these objectives. The IPP file, in concert with the Objective Menu, also allows for the comparison of assessment results with goals in various functional areas and at various levels for production of a list of "logical" choices for a given client's Program Plan objectives.

Software designed to track client demographic and clinical data, enrollment in programs, use of external services and referrals, special incidents and event, and goal and objective selection and progress monitoring has been implemented in nearly 100 developmental service agencies in the past two years.

Results

Software designed to track client demographic and clinical data, enrollment in programs, use of external services and referrals, special incidents and event, and goal and objective selection and progress monitoring has been implemented in

nearly 100 developmental service agencies in the past two years. With significant accumulation of data only recently available, it is difficult to demonstrate a direct improvement in client independence or level of functioning as a result of these systems. Rather, we will discuss reports the system produces that indicate the specific uses the data has been put to, as well as some subjective analysis of the managerial and political impact of the data.

1. **One report** provides case managers with "tickler lists" indicating client-related tasks to be accomplished with target dates and days remaining or overdue. This document becomes the primary "work order" for the case manager. While some resent the constant reminder of tasks that have not been completed, virtually all appreciate the added degree of structure to their job. A specific request, recently implemented, was the addition of a "Barrier" to accomplishment of the task. This will allow Program Coordinator "Bill" to explain his inability to find a supervised apartment setting for the first client on the report.

2. **Another report** is used by administrators to oversee case manager caseloads and performance. Case management supervisors have substantiated their ability to better allocate staff resources utilizing reports which indicate timeliness of task accomplishments. Even without commenting directly to staff about performance, it is their subjective belief that tasks are being performed on a more timely basis. This results primarily from the staff person's knowledge that this information is being collected and has been deemed important.

3. **A third report** documents service needs that were found difficult to meet. It allows the detailing of unmet needs by service category and provides a measure of the severity of the need. A consequent report can show the same data, but focused on a specific client category, e.g. those requiring a wheelchair. It also allows problems with particular funding sources to be noted. Individual agencies have concentrated resources to resolve these problems and funding sources have agreed to contract modifications as a result of these reports. At the state and regional level, these reports are run for each provider agency to determine the needs that should be addressed in the next round of contracting.

The ability to attach client characteristics to reports resulted in discovery of specific sub-groups denied access to certain services. For example, clients with mobility limitations had dental services provided more irregularly, and clients with behavioral problems failed to participate in "leisure time" activities at the same rate as other clients.

The ability to attach client characteristics to reports resulted in discovery of specific sub-groups denied access to certain services.

It is important to stress the way these reports vary from the more typical "needs assessment" data. Most states perform a needs assessment with a questionnaire to the provider agencies. The agencies respond with the largest numbers they can possibly justify and the end product usually exaggerates overall needs. Even more serious, the results do not represent their true mix of needs. These reports are based on suitable client data. For each need, there is a specific

client with that need documented in his/her individualized plan. The accuracy and credibility of the assessment is far higher, and therefore much more heavily utilized.

4. **The process of selecting client objectives** from an easily modified menu of options, developed at the agency level, results in clearer, better written behavioral statements in the client's individualized plan. A Data Sheet format used in one state for daily recording of activity associated with a given objective. There is a similar sheet for each objective in the client record. While this approach greatly reduces the clerical burden on the participants in an interdisciplinary team meeting, a great deal of resistance occurs if team members do not have a simple, non-bureaucratic approach to adding new objectives to the menu. The team must feel that it is in complete control of the plan to insure that it truly meets the individual's needs. For this reason, statewide menus of objectives are very difficult to implement and are likely to result in a perversion of the team planning process.

5. **The system is capable of producing reports** that monitor client progress on an objective by objective basis. One report may show progress for a single client, while another may demonstrate how a particular program, sheltered workshop, is doing within a range of objectives for clients requiring wheelchairs. Far and away the greatest use of this information is in targeting staff development programs. Internally, programs having success teaching certain skills can share their techniques, task analysis, curricula, etc. with programs having trouble. Outside training programs can be pursued based on the clearly defined need to enhance client progress in specific areas.

6. **State agencies see themselves** as expending money to buy more independent, higher functioning clients. To that end, they fiercely audit every nickel expended to insure that they are not being defrauded, but they collect virtually no information with regard to just how much client progress they are purchasing. Information as described above is far too specific to be dealt with on a state level. Rather, information showing gross client movement through program levels, is the appropriate focus. For example, one report may answer the question: how have we done with clients who were in group homes in 1985? A pie chart would be produced which may show that almost half are still in group homes, but nearly one-third have moved on to supervised apartments or independent living. Variations on this report might exclude clients over 60 years of age, in order to measure the impact of aging on the number of clients moving to Intermediate Care Facilities (ICF). It may focus on one agency, region, client type, program, or any other mix of characteristics in the database. Residential programs may be broken down into a larger number of levels for more detailed tracking, and day programs ranging from habilitation to competitive employment may be defined.

This type of information moves the state agency toward planning the purchase of services and the allocation of resources with the central purpose being client progress. §

Rather, information showing gross client movement through program levels, is the appropriate focus.

Measurement Strategies for a Model of Information System Effectiveness in Human Service Organizations by Hugh D. Grove, Frank H. Selto, and Donald J. McCubbrey

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Introduction

Information system applications, which include strategic planning, systems analysis, design, development, implementation, and follow-up, may invest considerable resources on a continuing basis. Yet little is known concerning whether this use of resources contributes to effective attainment of an organization's goals. Often it is a matter of perceived competitive necessity to improve information systems (IS). However, there is little documentation of actual IS effectiveness, especially in terms of cost-benefit analysis for human service organizations, where outcome measures of benefits are notoriously difficult to obtain.

This paper describes variable measurement alternatives for a cost-benefit, causal model of IS effectiveness for the human service organization. Due to space limitations, the conceptual bases for this model are described only briefly here, and full specification of the model is not discussed. This model will be validated in a future field study of medical care organizations. This field study will provide a valid basis for more extensive analysis of IS effectiveness in human services.

This paper describes variable measurement alternatives for a cost-benefit, causal model of IS effectiveness for the human service organization.

Cost Benefit Hierarchy

Our IS effectiveness model is consistent with a cost-benefit hierarchy used in human services (Ramanathan, 1982). This hierarchy ranks alternative benefit measures according to their relevance for program performance evaluation. An ideal measure of IS effectiveness would be monetary benefits or values of outcomes. For example, in the health care industry the monetary benefits related to a new IS might be the incremental earning power of "cured" patients or, alternatively, the incremental patient revenues due to the new IS. Unfortunately, these first order, monetary benefits are often unobtainable and lower order types of benefits must be used. The next most desirable measure would be non-monetary benefits or outcomes to compare with IS costs. For example, the incremental number of patients cured due to the new IS could be a non-monetary benefit. This type of cost/non-monetary benefit analysis has often been designated as cost-outcome or cost-effectiveness analysis in non-profit performance evaluation (Sorensen and Grove, 1977).

If these types of benefit measures are not available, then lower order, process measures could be generated. Ex-

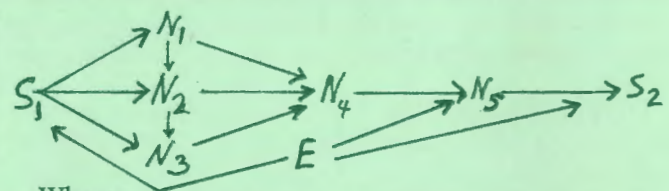
amples include the incremental number of patients treated or the additional number of documents processed by the new IS. Lastly, if no other result measures are available, non-monetary inputs, such as additional number of staff hours worked, may be compared to additional IS costs in an attempt to assess effectiveness in human service IS.

The need to perform various types of cost-effectiveness analysis for IS efforts is especially important in the current "retrenchment" environments of many service organizations. Such performance evaluation measures may be used by the service organization to alleviate threatened resource cut-backs or to perform more efficiently with fewer resources. Cost-effectiveness analysis also avoids the "across-the-board" approach to retrenchment which ignores any program evaluation responsibilities. It may also be used by the IS department to integrate its own activities with other more traditional (and measurable) activities of the organization, to justify its growth to top management, and to help both IS personnel and users prioritize projects for the service organization. If such IS cost-effectiveness measures are not available, then the organization may be left with tautologies offered by IS personnel: "the information systems are needed or we would not have developed them!" (Howlett and Jones, 1987).

If such IS cost-effectiveness measures are not available, then the organization may be left with tautologies offered by IS personnel...

Is Cost Effectiveness Model for Human Services

Our IS cost-effectiveness model hypothesizes causal relationships between changes in IS, changes in the decision relevant information, changes in decisions and changes in benefits. The following variables are proposed and are also designated as input, process, or output measures from the cost benefit hierarchy:



Where:

- S1 is the change in the IS, (and is a cost and a non-monetary input measure);*
- N1 is the change in data processing efficiency, (and is a non-monetary process measure);*
- N2 is the change in information to decision-makers, (and is a non-monetary outcome measure);*
- N3 is the change in productivity of decision-makers, (and is a non-monetary outcome measure);*
- N4 is the change in decisions by decision-makers, (and is a non-monetary outcome measure);*
- N5 is the change in service benefits, (and is a non-monetary outcome and/or a monetary outcome measure);*
- E represents environmental variables that may affect the IS changes, the non-monetary and monetary service benefit variables;*

S2 is the next iteration of the model when subsequent changes in the IS occur as measured by the S1 variables.

The arrows in the model denote one-way causal relationships. The model is initialized by a change in the type of IS that the human service organization has been using. Thus, the model lends itself to time series analysis of the effectiveness of specific human service IS. However, the model can also focus on existing types of human service IS and, therefore, lends itself to cross sectional or comparative analysis of the IS effectiveness in similar human service organizations.

Measurement Strategies for Model Variables

A set of measures for the proposed variables has been developed from a review of the IS effectiveness literature. We operationalize the IS effectiveness model for human services generally and for the field study as follows.

Model Variables S1 and S2

Variable	Measures
S1 : Change in IS and	Changes or improvement
S2 : Subsequent changes in IS	
Proxies:	
1. IS configuration	1. hardware and software costs; EDP personnel costs; supplies; budget performance; personnel hours; system hours and capacity, etc.
2. IS commitment	2. management attitudes;
3. IS planning	3. management attitudes; organization structure analysis.

A number of recent surveys of IS users have used and validated scale measures of these variables (Doll, 1985; Srinivasan, 1985; Miller and Doyle, 1987). For the "IS configuration" variable measure, an IS cost example, using the five point Likert scale from strongly agree to strongly disagree, is (Doll, 1985): *(1) the new IS has reduced the cost of maintaining the existing system.* As an alternative to a user survey, IS costs and hours may be obtained directly from the human service organization's accounting information system.

A user survey example of the "IS commitment" variable measure is a Likert scale adopted from a semantic differential scale used by Miller and Doyle (1987): *(2) top management is strongly involved in IS project development.* An example of the "IS planning" variable measure is a five point Likert scale, adopted from a semantic differential scale used by Miller and Doyle (1987): *(3) strategic IS planning occurs in this organization.*

Model Variable N1

Variable	Measures
N1: Change in data processing efficiency	
Proxies:	
1. Change in routine throughput	1. data entry response time; data processing error rates; benchmark analysis for records, invoices, etc.
2. Change in special project response	2. data retrieval response time; project analysis response time;

For this data processing efficiency variable, the proxy variables of "routine throughput and special project response," could be measured from previously reported user surveys (Srinivasan, 1985; Baroudi, Olson, and Ives, 1986; Miller and Doyle, 1987). We will use a five point Likert scale. An example of the "change in routine throughput" variable measure is (Srinivasan, 1985): *(1) it is difficult to understand the input procedures for using the system.* An example of the "change in special project response" variable measure is (Srinivasan, 1985): *(2) the system responds quickly to a user inquiry.*

An alternative approach is to use system performance or benchmark tests for measuring these two data processing efficiency variables. One study (Sincar and Dave, 1986) advocated the use of the following benchmarks: number of records or documents made, various intensive calculations by the central processing unit (CPU), and various intensive calculations for the input and output devices. Also, average response and down times for the system could be calculated and compared to budgeted or required response and down times to assess data transaction processing efficiency (Howlett and Jones, 1987). Instead of a user satisfaction survey, data would just be collected on these various benchmarks, i.e. the number of records made by the new system for accounts receivable.

Model Variable N2

Variable	Measures
N2: Change in information to decision-makers	
Proxies:	
1. Change in report timeliness	1. percentage of time: reports are done at appointed time and reports are distributed to correct end-users;
2. Change in report accuracy	2. report error rates by significance of error type;
3. Change in report relevance	3. report usage by key variable; surveys for report usage and user anxieties;

For this variable, user surveys could again be used (Srinivasan, 1985; Baroudi et. al., 1986; Miller and Doyle, 1987). An example of the "change in report timeliness" variable measure, using the Likert scale adopted from the semantic differential, is (Baroudi et. al., 1986): *(1) output information is available on a timely basis.* An example of the "change in report accuracy" variable measure is (Baroudi et. al., 1986): *(2) the output information is accurate.* An example of the "change in report relevance" variable measure is (Baroudi et. al., 1986): *(3) the output information is relevant to the intended function.*

For another user perspective, Howard and Smith (1986) studied computer anxiety in management and developed 24 questions concerning users' general attitudes toward computers that could measure changes in information to decision makers. From field studies, acceptable error rates could be determined and compared against actual error rates to measure report accuracy, rather than a user survey approach. Also, to measure the perceived level of relevance in various reports, the desired level of security could be compared against the actual level of security achieved (Howlett and Jones, 1987).

Model Variable N3

Variable:	Measures:
N3: Change in productivity of decision-makers	
Proxies:	
1. Change in analysis time	1. percentage of time system and various components are available for end-users; user logs and surveys;
2. Change in problems analyzed	2. percentage of time system, as opposed to manual method, is used to analyze problems; user logs and surveys, motivational analysis;

To measure the decisionmaker proxy variables of "change in analysis time" and "change in problems analyzed," scales from various studies could be used (Srinivasan, 1985; Howard and Smith, 1986; Howlett and Jones, 1987; Miller and Doyle, 1987). For example, Miller and Doyle (1987) identified an "end user computing" factor with four questions that could be used here. For the "change in analysis time" variable measure, the related user survey question is: *(1) there are more analysis systems available for users.* For the "change in problems analyzed" variable measure, the related user survey question is: *(2) more problems are analyzed with user systems.*

Model Variable N4

Variable	Measures
N4: Change in decisions by decision-makers	
Proxies:	
1. Change in alternatives	1. number of alternatives provided by decision support system; user surveys;
2. Change in plans	2. number of plans provided by decision support system; user surveys;
3. Change in choices	3. percentage of time system, as opposed to manual method, is used to make decisions; user surveys;

For this variable and its proxy measures, alternatives, plans, and choices, various user scales could be applied (Srinivasan, 1985; Doll, 1985; Howlett and Jones, 1987; Miller and Doyle, 1987). An example of the "change in alternatives" variable measure is (Doll, 1985): *(1) the system is adaptable in providing alternative output requirements.* An example of the "change in plans" variable measure is (Srinivasan, 1985): *(2) use of the system helps me in identifying and defining plans.* An example of the "change in choices" variable measure is (Srinivasan, 1985): *(3) use of the system has enabled me to make better decisions.*

Model Variable N5

Variable	Measures
N5: Change in service benefits	
Proxies:	
1. Change in non-monetary	1. incremental utilization rates; results incremental improvement in treatment or service results; reduction of personnel numbers;
2. Change in monetary results	2. incremental revenues and/or funding; monetary impact, like client earn-

ing power, from improved treatment or service results; cost savings from personnel and other reductions; reduced or avoided economic losses from system improvements

As an alternative to user surveys, field studies could be done to collect data concerning the change in service benefits (or similar questions could be asked on a survey instrument). The following measures could be used for the "non-monetary results" measure: incremental and traceable utilization rates of services and improvements in clients, and number of reduced personnel hours. The following measures could be used for the "monetary results" measure: incremental and traceable service fees, cash flows, and cost savings, such as reduced personnel salaries.

If the monetary benefits could be measured, then established financial analysis methods could be used, such as return on investment (ROI), net present value (NPV) and annualized cash flow, to evaluate IS effectiveness for human services. One research study attempted to associate the level of IS planning to the market based ROI over a period of years (Selto and Grove, 1984).

Model Environmental Variables

Variable	Measures
E: Environmental variables	
1. General economic performance	GNP; disposal income; inflation rates;
2. Specific economic performance	Regional, state and local income and production;
3. Funding/support	Funds available for specific services;
4. Specific entity activities	Changes in types of services and programs;

The various environmental variables can be measured by collecting data from the various general and specific sources listed above. A user survey or a field study of the human service organization may be undertaken to collect data for the last item listed above.

Conclusion

Our model for assessing the effectiveness of IS for human services with variables, proxies, measures and sources is summarized in Figure 1. The specific survey instrument to measure IS effectiveness will be developed from the Figure 1 guidelines. Only previously validated survey questions will be used from the Figure 1 sources. A pilot study will further validate the survey instrument. This instrument will then be tested in a future field study which will attempt to implement this model with actual measures relating to IS effectiveness in human services. §

This instrument will then be tested in a future field study which will attempt to implement this model with actual measures relating to IS effectiveness in human services.

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FIGURE 1: SUMMARY OF IS EFFECTIVENESS MODEL

VARIABLES	PROXIES	MEASURES	SOURCES
S1, and S2: Changes in IS and Subsequent IS respectively	IS configuration and IS commitment and IS planning	Hardware and software costs personnel, etc. Management attitudes	Doll (1985) Organizations' data bases Miller & Doyle(1987) Srinivasan (1985)
N1: Change in data processing efficiency	Change in routine throughput and changes in special project response	Response time Error rates Benchmarks	Baroudi et.al.(1986) Sircar & Dave (1986) Srinivasan (1985) Miller & Doyle (1987) Howlett & Jones (1987)
N2: Change in information to decision makers	Change in report timeliness and Change in report accuracy and Change in report relevance	Timely dis- tribution	Howard & Smith(1986) Baroudi et.al.(1986) Srinivasan (1985) Miller & Doyle(1987) Howlett & Jones (1987)
N3: Change in productivity of deci- sion-makers	Change in analysis time and Change in problems analyzed	System avail- ability for end-users System use User logs	Same as N2
N4: Change in decisions by decision makers	Change in alternatives and Change in plans and Change in choices	Alternatives for decision support system	Srinivasan (1985) Doll (1985) Miller & Doyle(1987) Howlett & Jones (1987)
N5: Change in service benefits	Change in non-monetary benefits and Change in monetary benefits	Service results Utilization rates data bases Service revenues Cost savings	Selto & Grove(1984) Organizations'
E: Environ- mental variables	Economic and Funding and Specific entity	GNP, state income, inflation, etc. Funding programs Changes in service and programs	Government and other data bases Organizations' data bases

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Collecting Accurate Information about Child Abuse by Jean K. Harrod, Ph.D.

6194 Willow Creek Dr. Canton, MI 48187

Introduction

The recognition of child abuse and neglect (CAN) as a major problem, and programs to identify, treat, and prevent child abuse/neglect, have developed primarily within the last few decades (The American Humane Association & Denver Research Institute, 1979). Michigan is a leading state in automated child welfare data gathering, with a statewide, computerized Protective Services Management Information System (PSMIS) which has been in place for about ten years (Michigan Department of Social Services, 1984).

Virtually all the statistics that exist regarding child abuse in Michigan are gleaned from this PSMIS system. The same is true of most American information, as the American Humane Association, American Welfare Association, and National Society for the Prevention of Child Abuse figures are all based on the same aggregate data from the states. In other words, the entire knowledge and research base for the emerging field rests on belief in the output of automated data systems. This is, of course, the trend in many human service programs, as case by case data extraction is difficult and costly. It is particularly hard to obtain noncomputerized comparison data about CAN however, due to the recent development of the whole field (for the most part since the introduction of automated systems) and the highly confidential nature of the case material.

It has been observed that computer professionals and end-users frequently speak mutually incomprehensible languages (Friske, 1984). Systems analysts often choose a computer science career because they prefer to work alone. The disparity is most pronounced when the user is a "people person," whose distaste for hard sciences, rigid specifications, and things mechanical were strong determinants in the choice of a human services career. To most child welfare workers, filling out computer input forms or learning to understand a printout have little appeal compared to direct assistance to children and families in need (Vinokur-Kaplan & Hartman, 1986).

"Garbage in, garbage out" is a fundamental tenet in computer science. With few exceptions, human service end-users queried by Dery (1981) said they view computer reports generated by computer management information systems (MISs) as so full of errors as to be completely worthless. This belief, shared by workers, supervisors, and administrators who are in a position to have other, more direct data, is disquieting. It provides an easily available excuse not to take care to feed the system accurate information. If true, it would also mean the theoretical framework: knowledge base, and management decisions for the treatment of child abuse are being based on false information. Profound funding and staffing choices, as well as sensitive decisions, affecting families and literally changing children's lives, may be based on incomplete, or worthless, information.

The purpose of this study was to explore the extent to which the automated information about child abuse/neglect which reaches administrators and educators is accurate. A second purpose was to question first-line Children's Protective Services (CPS) supervisors, whose workers produce the

information, about their attitudes, experience, and opinions about the automated systems and the statistical reporting part of their function, and to test if such supervisory differences significantly influence the accuracy of the work from their respective units.

With few exceptions, human service end-users queried by Dery (1981) said they view computer reports generated by computer management information systems (MISs) as so full of errors as to be completely worthless.

Methodology

The sample was drawn from the computerized documents used by workers to report information about Children's Protective Services cases from Wayne County, Michigan, and questionnaires about attitudes and practices towards computerized systems, completed by the supervisors of the workers who fill out the input forms. Wayne County is the only county in Michigan which is also a Department of Social Services "Region" by itself, and handles roughly half of the CAN (child abuse and neglect) reports for the whole state. It has a population larger than many states, and contains inner city, urban, aging and still growing suburban, and even rural areas within its borders. The Wayne County Department of Social Services Children's Protective Services is the sole recipient of child abuse and neglect complaints for the county.

Supervision and administration within the Department rely heavily on the casework consultation model. The Children's Protective Services Manual is standard throughout the state (State Of Michigan, 1983). It is quite explicit about PSMIS procedures, and the forms and instructions in the PSMIS section are usually followed much more closely than many other sections of the manual, in order to be able to interact with the statewide computer network. The CIS and PSMIS case documents are, in fact, the only written case records routinely seen by anyone but the worker, and, at times, the immediate supervisor.

CPS case information is inherently difficult to code, requiring extensive case knowledge, subjective decision making, and form flexibility which exceeds the most sophisticated data processing error control techniques. Due to the highly subjective nature of a CPS worker's role, and the complete absence of any case knowledge by systems staff, only the most basic errors can be detected, required fields left blank, numbers in boxes which should have letters or vice-versa, or impossible gross codes (no child or victim listed in a case which must have at least one child victim by definition, cases whose closing date precedes the opening date, etc.). Many other errors, although equally gross (such as the failure to identify other child victims, or a case shown as open that is no longer open, or never should have been opened), are impossible to detect through current clerical error detection procedures. Only the caseworker, or the front-line supervisor, if familiar with the case, can know if the information submitted is indeed accurate. While some refinement of

form and system design may make error detection at centralized collection points a bit better, the major thrust of error control will always be at the worker/supervisor level.

Almost 70% of the cases had some sort of error in the "names" field. Very few (1.3%) of these errors involved persons being listed who should not have been.[1]

Children's Protective Services workers are State Civil Service employees, and programs are administered on a county basis. Caseworkers must have a minimum of a B.A. degree and experience in defined human services areas. Supervisors must have a minimum of a M.A. degree and two to three years of experience. The group contained 13 Caucasian, 10 Black, and 2 "other" supervisors and administrators. While they may have had varied personal experience with automated data systems outside this employment setting, virtually all have had long experience with the form and system to be sampled, due to the unusual longevity of the group. Compared to a recent national profile of child welfare supervisors, these supervisors were very similar in age (40-41 years) and many other respects (Vinokur-Kaplan & Hartman, 1986). The sample tended to have slightly fewer females (52% versus 66%), fewer whites (52% versus 78%), and more education (100% versus 63% having post-baccalaureate degrees).

The sample contained 48 denied cases, 192 open cases, and 64 closed cases, each type requiring additional system input. The examination of accuracy portion of the study was a straightforward comparison of the data elements the worker recorded on the PSMIS (independent variable) with how the form should have been filled out (dependent variable), as determined by other written material contained in the worker's casefile, and MDSS manual instructions. A second reader completed the same procedure on 30 random cases (10% of the total). An inter-rater reliability (product-moment coefficient of correlation) of .9504 was found.

All supervisors and section heads (a 100% sample, N = 25) filled out a brief questionnaire probing general background, attitudes towards case paperwork, MIS staff and data submission requirements, and specific supervisory practices which might be expected to influence the accuracy of data coming from their respective unit. Each independent variable was compared to error in the work from the units.

Eight PSMIS fields which are not used, or are machine generated, were removed for the within PSMIS comparisons. All within PSMIS error was expressed as percent error per field used, as the total chances for error are greatest in closed cases, which use all 35 boxes, less for open cases, which require 27 boxes, at least for denials, which require the worker to use only the first 24 boxes. A single measure of error per case was used in comparisons to supervisory questionnaire items.

Results

A mean rate of PSMIS errors of 19.558% per field was found, taking average error for all scored cases and fields.

The error rates for the PSMIS fields scored, as a function of times each box is used, is presented in below.

AVERAGE ERROR RATES BY PSMIS FIELD

#	ITEM NAME	% ERROR
1	Primary Recipient Name	8.9
3	Referral Date	21.1
7	Referral Source	22.0
8	Number of Prior Referrals	22.0
9	Hours to First Contact	37.0
10	Date Investigation Completed	18.1
11	Living Arrangement at Investigation	7.6
12	ADC Status	13.2
13	In Care Of	1.3
14	Number and Street	18.1
15	City	4.6
20	Name	69.1
22	Birth Date	7.2
23	Sex	.7
24	Race	3.3
25	Role	33.2
26	(Type of) Abuse	31.3
27	(Type of) Neglect	40.2
28	Living Arrangement at Closing	54.7
29	Close Date	9.4
30	Closing Code	26.6
31	Court Involvement/Disposition	31.3
32	Non-Court Disposition	28.1
33	Greatest No. Days in Temp. F. Care	15.6
34	Reason in Foster Care Over 21 Days	14.1
35	Reason Case Open Over 6 Months	23.4(a)

a) Would have been higher, if taken as a percent of cases open 6 months or longer, rather than all openings.

Discussion of PSMIS error

The reliability of the data in this central registry was found to vary significantly depending on the field in question, the type of transaction reported on, and the unit doing the reporting. Of the scored fields, the "core items", appear to be the most reliable, with several notable exceptions. Almost 70% of the cases had some sort of error in the "names" field. Very few (1.3%) of these errors involved persons being listed who should not have been.[1] Almost all involved persons living in the household, or involved in the case, were being left off the central registry, or names spelled wrong, or both. This is devastating if a central registry is to be useful in finding a particular person in the future when a worker clears another complaint, or an application to work with children is cleared against that registry.

It also was the writer's impression the vast majority of the people left off were men. Fundamental CAN theory about which sorts of households put children most at risk are based on these reports. Critical information about who neglects and abuses children is skewed when the real perpetrator, a male, is left off, and the only other adult in the home, the mother, must then be identified as "neglecting" the injured child, since someone must be coded as a perpetrator, failure to identify non-legally-related men in the child-at-risk's life is of utmost importance, since children are a ten times the risk from "boyfriends" as from husbands and fathers.[2]

Another "core item" with a very low reliability is "referral date". In 21% of cases sampled it was not correct. When it is

not (or cannot) be accurate, the validity of using performance measures which flow from this date is certainly questionable. Other fields frequently used to measure performance are "hours to first contact" (37% average error), "date investigation completed" (18%), "living arrangement at closing" (55%), and "reason case was open longer than six months" (23%).

One explanation for such inaccuracy may be that workers, knowing there is little likelihood that anyone above their supervisor would be the wiser, tend to "fudge" their responses on items they know administrators are watching. But an examination of the directionality of error shows it varies by item. It is also not safe to assume errors just "cancel each other out." For the most part they do not, on any given item.

Some of the types of data commonly seen in national aggregate information seems highly error prone. "Referral Source" is often used to target community education, or predict which sources are the most likely to make substantiated reports or the most serious referrals, when intake staff is limited. The sheer number of choices, with many overlapping or vague, may be a major contributing factor to the 22% average error in this field.[3] Type of abuse or neglect, and the correlates thereof, is another popular research topic. Average error rates of 31.3% for neglect coding, and 40.2% for abuse coding, calls into question research done using any sort of central registry data.

Of the cases read which were substantiated (i.e. the "abuse" and "neglect" boxes were filled in), 58.3% were coded as being either abuse, or neglect, only. The PSMISs as submitted are similar to currently prevailing national data and theory. Only 3.5% were coded as having elements of both present, although the PSMIS manual clearly indicates this should be done, when the case findings are such, and nothing in the system hampers the worker from doing so. This study found 40.6% of the cases should have been coded as "both".

It seems workers go for parsimony; one perpetrator and one type of neglect or abuse are needed to get the central registry form through, and that is what the workers put down. Although it was not empirically tested, the high rate of "unfavorable to worker" mistakes, left-off men, and simplistic coding may all be similar in that workers have learned a pattern that "gets the things through", and use it habitually.

The finding that more complete cases, which contain both elements of abuse and neglect (p less than .0001), or are court-involved ($p = .0225$), are significantly more accurate overall, is very interesting. It may be more physical abuse cases, which are easier to code, become court involved. It could also be posited workers spend more time being careful on these cases overall, but most workers would not be sure if a case is going to go to court when most of the PSMIS is filled out, and the vast majority of abuse-and-neglect cases were not even coded as both when the workers filled the form out. This finding needs further study to determine why CPS staff code complex cases more carefully.

Discussion of questionnaire results

None of the null hypotheses regarding the supervisors' influence on accuracy were rejected. A number of analyses of variance between particular pairs, on particular items, are provocative, primarily as suggestions for more focused areas

for future study. None can be seen as significant, however, given the small sample sizes and large number of analyses of variances performed.

Line supervisors were suspicious of PSMIS information. Most didn't see it as particularly useful to them or workers, but regard PSMIS information as "useful to administration". They also give themselves as the most common person who handles PSMIS problems, But not a single supervisor mentioned "clerks" as a source of help with PSMIS problems.

One item stands out by its lack of response: an almost 100% response rate was achieved for most of the questionnaire with the exception of the question asking supervisors to estimate how often they and others used PSMIS reports. Respondents seemed to genuinely have no idea how often they were used by their workers, peers, or section managers. CPS workers work closely together and, it may be hoped, have excellent communication skills. One can only guess positive use of the computer is not discussed in polite child welfare company. Similarly, it may be easier to admit computers are not so bad in an anonymous questionnaire, while continuing to decry them in social interactions. Perhaps the most interesting finding was that most of the human service supervisors said they liked computers, or were at the least indifferent to them.

The main influence on worker accuracy was expected to be the individual supervisor. Sex and race of supervisor did not influence accuracy. Differences between supervisors were found to be significant, however ($F = 1.6059$, $p = .0472$). On the other hand, differences between sections were also found to be highly significant, which had not been predicted ($F = 4.3980$, $p = .015$). In most questionnaire responses, the section heads were similar to the supervisors. There were some differences, however. Section heads thought "PSMIS is useful to workers" far more than did supervisors. Section managers said it was true "Since PSMIS, administration knows more about unit business" far more often than supervisors. And supervisors say "In the agency, the major force is really self-regulation, not management" is true far more often than do the section heads.

A least squares regression technique was performed on supervisory questionnaire items, as predictors of PSMIS accuracy. Five questionnaire variables, although not all individually significant, were found to explain almost 60% ($r^2 = .57577$) of the variation in PSMIS accuracy. The most accuracy-producing supervisors said they were "more logical than intuitive," saw themselves as being more willing to take risks than their peers, believed PSMIS information might be used against them in the future, checked their staff's PSMIS forms for accuracy when doing routine case readings, and had done "computer or information system design of training."

Information from this project indicates an accuracy check at the time of routine casereading produces significant improvement in unit accuracy, whereas pre- and post-processing checks do not.

Information from this project indicates an accuracy check at the time of routine casereading produces significant improvement in unit accuracy, whereas pre- and post-processing checks do not. This is not surprising, as batch scans of forms (as they leave or return to the unit) primarily save turn-around and clerical time on documents which will "error out" at clerical pre-audit. To do an additional qualitative accuracy check, without reading the case, would require the supervisor to store minute detail on hundreds of cases in their heads, which is clearly impossible. Routine form-with-case reading may pick up and correct mistakes before the forms are sent. Or, it may be when workers know with certainty the input form will be scanned, the worker's accuracy level changes.

Summary

Life-or-death decisions for children currently rely on the accuracy of statistics derived from computerized child abuse/neglect central registries. So do decisions involving tremendous amounts of money. Child abuse and neglect treatment emerged as a professional field relatively recently, roughly parallel to the creation of widespread computer usage for statistics and management information gathering. Basic theoretical and clinical knowledge is formulated almost entirely from information derived via automated data systems, with no idea how the method of collection may have confounded the data. This study is an initial effort to move beyond speculative analyses, sample cases, and experimental or prototype systems, and actually examine a real child welfare management information system (MIS), in place.

In general: previous knowledge about good form design and error control from other fields would appear applicable to central registry documents, which are filled out by child welfare specialists. The main challenge is finding adequate funding for modern supplies and equipment, and enough high quality staff to implement what can be found in the literature.

Conversely, previous literature from other user-groups was of little use in predicting child welfare supervisors' attitudes of behavior. It may be that computer-aptitude, as previously measured, is not related to attention to accuracy in systems input. Or, this group may be so different that other research does not apply to them. Perhaps the previous literature may need re-examination. In any case, more studies with a rigorous empirical approach are in order, particularly studies of non-traditional users, in real life settings. §

1. See Dissertation Abstracts International for methodology & results.
2. Anne Cohn, Keynote Address, Michigan Statewide Conference on Child Abuse and Neglect, Ann Arbor, MI, November 4, 1986.
3. Similar to results found by Seaberg & Gillespie a decade ago.

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Microcomputers in Private Nonprofit Agencies: A Survey of Utilization Trends and Training Requirements by Jerry Finn, Ph.D.

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Abstract

This study reports the results of a survey of microcomputer utilization by 220 human service agencies in the Triad region of North Carolina, representing the vast majority of the private nonprofit agencies which utilize microcomputers. The survey included information about the length of microcomputer use, the functions for which it is used, which staff utilize the system, the type of data kept in the system, confidentiality and security measures used to protect sensitive data, present and anticipated staff training, direct service uses of the microcomputer, considerations in choosing not to computerize (for those indicating that they do not have a microcomputer), and problems/concerns regarding the agencies use of microcomputers. In addition the survey focused on the microcomputer information and training needs as perceived by the agencies themselves.

The results indicate that microcomputers are currently utilized by 48% of private nonprofit agencies, and that within two years three-fourths of all agencies will own microcomputers. Microcomputers continue to be used primarily for word-processing and financial management. However, there is increasing use of microcomputers for direct service functions, especially maintaining client records. Very few agencies are using their systems to network with other agencies in providing case management nor do agencies express much interest in decision support systems.

This study reports the results of survey of microcomputer utilization by 220 human service agencies in the Triad region of North Carolina

The use of microcomputers for direct service functions and networking raises concern about maintenance of confidentiality and ethical use of information. This concern appears well founded. Of agencies maintaining client records, approximately 40% used password protection for entering the system and 22% utilized code numbers instead of client names in their record keeping. More importantly, only 9.4% reported that the agency had set up an Ethics Committee to monitor and evaluate the ethical use of client information.

Agencies listed a number of problems and concerns with regard to the use of microcomputers. These included: lack of appropriate software, changing staffing requirements, lack of funds to upgrade the system and pay for additional programming, concerns about confidentiality, and inadequate training for staff. Several agencies reported that there was increased dependence on a few staff who understood and operated their systems, and that it was extremely disruptive when these personnel left the agency.

The results of this survey indicate increasing use of microcomputers by human service agencies and greater involvement of direct service staff than previously reported. Implications for human service agencies and social work educators are discussed.

Introduction

There is currently a lack of information regarding the extent to which the relatively new information technologies are being utilized in present human service practice. The computers in human services literature has described the potential of information technology to affect social agency practice (Phillips, 1986; Hedlund and Garson, 1985; Taylor, 1981; Boyd, Clark, and Hanson, 1980; Sullivan, 1980; Quinn, 1976), has provided descriptions of microcomputer use in individual agencies (Pardeck and Murphy, 1986; Schwartz, 1984; Hale and DeL'Aune, 1983; Schoech and Schkade, 1980; Jaffe, 1979; Schoech, 1979), and has made projections of the future use of information technology by human service agencies (Geiss and Viswanathan, 1986; LaMendola, 1985; Taylor, 1981; Ramm and Gianturco, 1973). Human service professionals must be able to describe the present and projected applications of information technology by human service agencies in order to meet current training and consultation needs and to prepare future workers for the realities of agency practice.

The true extent of microcomputer use by human service agencies, however, is largely unknown. Recent reports in the Computer Use in Human Services (CUSS) Network newsletter estimated that between 25% and 68% of human service agencies are presently using computers (Jaros, 1984; Levi, 1983; Larson, 1984; Baskin, 1984; Gunderson, 1983; O'Riley, 1983). Some of these reports do not differentiate microcomputer from other data processing methods while others are based on limited or esoteric samples. The CUSS Network newsletter also reported the results of a survey of English speaking professional Canadian social workers (Nutter, 1986). This survey indicated that 56% of respondents utilized computers in their agency and 22% worked in agencies which had microcomputers. It reported both microcomputer utilization and workers' attitudes regarding

TABLE I
NUA Reasons for Deciding to Purchase a Microcomputer
Percent

Reason	Not At All	Somewhat	Great Deal
Availability of Training	46.4	35.7	17.9
Convenience	14.3	10.7	75.0
Economy	14.3	21.4	64.3
Promote Accountability	17.9	32.1	50.0
Provide Better Services	25.0	32.1	53.6
Recommendation-Auditor	75.0	17.9	7.1
Recommendation-Board	50.0	39.3	10.7
Recommendation-Peer	57.1	39.3	3.6

computers. The utilization portion of the study is somewhat questionable since 46% of workers reported that they did not know what kind of computer was utilized by the agency.

...between 25% and 68% of human service agencies are presently using computers

Recent summaries of computer use by human service agencies indicate that microcomputers are used primarily for administrative functions, especially budget and accounting as well as administratively related word-processing functions (Geiss and Viswanathan, 1986; Butterfield, 1983). It has been hypothesized that there will be increased use of microcomputers by and for direct service workers as computer literacy expands in the human service community. The Nutter (1986) study, however, concluded that computers have not substantially increased access of line workers to useful information. The extent to which direct service workers in the United States utilize microcomputers and their satisfaction with these systems is also largely unknown.

Given the previous sampling problems involved and the fact that hardware and software costs continue to decrease, a more comprehensive study of microcomputer utilization by human service agencies is warranted. This survey focuses on microcomputer utilization by private nonprofit human service agencies. These agencies tend to be smaller than

TABLE II
Computer Functions

	MUA			NUA		
	Not at all	Somewhat	Great	Not at all	Somewhat	Great
Word Processing	6.7	24.4	68.9	10.3	31.0	58.6
General Ledger	35.6	11.1	53.3	24.1	13.8	62.1
Accounts Payable	53.3	8.9	37.8	17.3	24.1	58.6
Accounts Receivable	60.1	11.1	28.9	13.8	41.4	44.8
Payroll	64.4	6.7	28.9	13.8	41.4	44.8
Client Records	44.4	20.0	35.6	24.1	27.6	48.3
Billing	75.6	13.3	11.1	41.4	17.2	41.4
Personnel	62.2	24.4	13.3	55.2	27.6	17.2
Mailing Lists	20.0	15.6	64.4	10.3	6.9	82.8
Research	75.6	20.0	4.4	41.4	41.4	17.2
Scheduling	80.0	17.8	2.2	51.7	27.6	20.7
Interagency Networking	80.0	11.1	8.9	69.0	27.6	3.4
Decision Support System	93.3	4.4	2.2	65.5	31.0	3.4
Program Planning	71.1	20.0	8.9	34.5	51.7	13.8

government social service agencies and are more likely to use microcomputers rather than mainframe or subcontracted data processing. Private nonprofit agencies are especially important to investigate since they will be performing an increasing proportion of social service delivery (Wineburg, 1985). In addition, these agencies are often at the forefront of innovation in human services. Their use of information technology reflects current and perhaps future trends. This survey focuses on the extent of microcomputer use by private nonprofit human service agencies, their reasons for purchasing or not purchasing microcomputers, the functions for which microcomputers are used, the workshop/training interests of these agencies, the use of microcomputers by direct service personnel, security and confidentiality issues, and special problems or concerns of these agencies regarding their use of microcomputers.

Methodology

A survey of microcomputer utilization was mailed to human service agencies in the Guilford, Forsyth, and Mecklenburg County areas of North Carolina. This contains a SMA (Standard Metropolitan Area) of over one million people. Agencies were selected from a resource directory of The Human Services Institute, a private nonprofit organization whose function is to coordinate human service activities. Agencies were selected which provided social services policy and planning and/or direct services. All private nonprofit agencies were selected with the exception of those whose primary function is medicine. The survey was addressed to the director of the agency. A cover letter requested that the person most responsible for the agency's computer system fill out the questionnaire.

The survey included a brief agency description form and two separate instruments: one for agencies which presently utilized microcomputers and one for agencies which did not. Microcomputer using agencies (MUA) were asked for information regarding their present hardware and software, their training/consultation needs, the functions performed by their microcomputers, the kinds of client data kept and security/confidentiality measures used, problems or concerns with agency's use of microcomputers, and their overall satisfaction with computerization of the agency. Nonmicrocomputer using agencies (NUA) were asked whether they had plans to purchase a microcomputer during the next 3 to 5 years. If yes, agencies were asked to project answers to questions on the MUA form. If no, they were asked their reason(s) for not computerizing.

TABLE III
Agencies' Interest in Workshop/Training
Percent responding "yes"

TOPIC	MUA	NUA
Accessing On-Line Databases	60.6	17.2
Budget and Finance	45.5	62.1
Computerized Client Record Keeping	48.5	62.1
Computer Assisted Case Mana	24.2	17.2
Computers in Human Serv Overview	30.3	48.3
Decision Support Systems	12.1	7.8
Human Service Software	48.5	51.7
Interagency Networking by Computer	54.6	23.4
Word Processing	39.4	72.0

The survey was mailed to 220 agencies. After 3 weeks, a second survey was mailed to agencies which had not yet responded. After two more weeks, agencies were contacted by telephone and the survey was completed by phone whenever possible. Approximately one-fourth (51) of the surveys were completed by phone.

Results

Microcomputer Utilization

One hundred sixty agencies (72.7%) completed their surveys. Of these, 78 agencies (Microcomputer Using Agencies MUA = 48.7%) indicated that they presently used microcomputers and 22% of MUA also utilized a modem. Nonmicrocomputer using agencies (NUA) accounted for 82 (51.3%) agencies. It should be noted that 54.2% of NUA responded that they planned to purchase a microcomputer during the next three to five years, and 84.8% of these planned to purchase within two years. Thus it is estimated that within two years 76.3% of private nonprofit agencies will utilize microcomputers.

Agencies which utilized microcomputers had significantly larger budgets than those not using microcomputers. The mean budget for MUA was \$566,454 as compared with \$281,512 for NUA.

MUA varied in the length of their use of microcomputers. Approximately one fourth of agencies (28%) owned their microcomputers less than one year; 32.6 percent used microcomputers 1 to 2 years; 37.2 percent used them 3 to 5 years; and only 2.3 percent of MUA utilized microcomputers longer than 5 years.

MUA were asked how long they investigated microcomputers before reaching a decision to purchase. The majority of agencies took less than one year (less than 3 months = 26.3%; 3 to 12 months = 52.5%; 1 to 2 years = 17.5%; more than 2 years = 3.6%).

MUA and NUA planning to purchase a microcomputer were asked, "Who originated the idea to purchase the microcomputer(s)?" The majority of agencies responded that the idea originated from administration (72.1% for MUA and 60.7% for NUA). Board members originated the idea to purchase more often in agencies which are planning to purchase a microcomputer (MUA = 7.3%; NUA = 21.4%). "Line workers" were responsible for originating the idea to purchase a micro in a small percentage of agencies (6.8% for MUA and 3.6% for NUA).

NUA planning to purchase a microcomputer were asked to rate their reasons for choosing to obtain the microcomputer(s) as "Great, Somewhat, or Not At All." It can be seen from Table I that Convenience (75%), Economy (64.3%), Provide Better Services to Clients (53.6%) and Promote Accountability (50%) were listed as Great by a majority of agencies. It should also be noted that 21.4% of agencies listed Reduce or Not Add Staff as an important factor in their decision to purchase. The recommendation of board members, peers, or auditors was generally not seen as an important factor in the decision to purchase a microcomputer.

NUA which indicated that they did not plan to purchase a microcomputer were asked their reason for not using microcomputers. Expense (66.7%), no need (50%), and lack of trained personnel (31.6%) were indicated most often.

Other reasons included: too busy (10.5%), lack of custom software (5.3%), fear of obsolescence (5.3%), and organizational disruption (3.7%).

Microcomputer Functions:

Agencies were asked to rate their use of microcomputers using Not At All, Somewhat, and Great with regard to a number of agency functions. (NUA were asked to rate their expected use.) The results are summarized in Table II. Overall there is great interest among these human service agencies in receiving microcomputer training. For both MUA and NUA the greatest use of microcomputers is for word-processing, accounting functions, mailing lists, and client records. Decision support systems, research, scheduling, and networking functions were reported by the fewest agencies.

NUA expected to use their microcomputers to a greater extent than MUA for all functions. With regard to MUA, by looking at the Not At All column, it can be seen that almost half of all agencies do not use their microcomputers for functions other than word processing, maintaining mailing lists, and general ledger. NUA expecting to purchase microcomputers, however, expect to use them for a greater variety of functions. More than half of NUA expect to use their microcomputers for all functions with the exception of Interagency Networking, Decision Support Systems, Scheduling, and Personnel.

Training:

In order to assess training needs and interests, agencies were asked, "Which of the following workshops or training programs would you be willing to attend?" Results are summarized in Table III. It can be seen that the greatest interest among MUA was in the areas of Accessing On-line Databases (60.6%), Interagency Networking (54.6%), Developing Client Record Systems (48.5%), and Human Service Software (48.5%). The least interest was in the area of Decision Support Systems (12.1%).

NUA differed somewhat from MUA in their workshop/training interests. Their greatest interest was in Word-processing (72%), Computerized Client Record Keeping (62.1%), and Budget and Finance (62.1%). Their least interest was in Accessing On-line Databases (17.2%), Computer Assisted Case Management (17.2%) and Decision Support Systems (7.8%).

MUA were asked the number of hours of microcomputer training for various staff positions. Administrators received the most training with a mean of 29.48 hours. Direct service workers received significantly less training with a mean of 23.33 hours. Secretarial staff received a mean of 21.41 hours of training.

Agencies were also asked: "Who did the training?" Responses varied a great deal. The greatest number of agencies (31.8%) reported that they were trained by a Computer Dealer; other responses included: Variety (23.3%); In-house (18.6%), Consultant (12.2%); University (6.8%); and local government (2.4%).

In order to determine interest in a microcomputer information sharing network to promote interagency training, agencies were asked if they would participate in such an association. Among MUA, 24.4% answered "Yes," 8.1% said "No," and 67.5% said they would like further information.

NUA responded in similar fashion: "Yes, 21.6%; "No," 2.1%; Please send more information," 76.3%.

Direct Service Use:

Agencies were asked if direct service workers utilized their microcomputers. About one-third (29.5%) of MUA responded "Yes." NUA expecting to purchase microcomputers were asked to what extent they expected direct service workers to use their microcomputer(s). Two-thirds of NUA responded affirmatively (Somewhat, 40%; Great Deal, 26.7%).

MUA were asked to rate the satisfaction of personnel with their microcomputers from a scale of 1 (Not at All) to 7 (Great Deal). The answer reflects the opinion of the administrator who completed the survey. The mean scores were: Administrators (5.25), Direct service workers (4.41), and others (e.g. accounting) (5.67). Thus, while satisfaction with microcomputers is generally moderately high, direct service workers are significantly less satisfied than Administrators and other personnel.

Security and Confidentiality:

Seventy-four percent of MUA reported that they kept client data on their microcomputers. Agencies were asked to describe the methods used to secure confidentiality of their data. The most common method was "Secret Password" (40.1%); 22.2% utilized code numbers instead of client names; and 21.4% of agencies reported no procedures to insure confidentiality of their data. In addition, agencies were asked whether they utilized an ethics committee to review data security and use of computerized data. Only 9.4% of agencies answered "Yes."

Problems/Concerns:

Agencies were asked "What problems or concerns have you encountered in your use of microcomputers?" While specific problems varied widely, a number of themes emerged. Software problems were mentioned most frequently. These included inability to find appropriate software at an affordable price, the expense of programming when needs changed, and inability to choose the best, most appropriate software for agency purposes. Problems with regard to the impact of the system on agency staffing patterns were also frequently cited. In some cases agencies were left stranded when their computer knowledgeable staff found other employment. Some agencies were unprepared for the shift in staff time and responsibilities involved in keeping the system running smoothly. Lack of adequate training/consultation was mentioned by almost one fourth of agencies. Concerns also centered on both locating and financing training. Finally, the need to upgrade with its related expense was mentioned frequently by agencies who had utilized computers for more than two years. Many of these agencies were struggling with whether to network systems or use stand alone microcomputers. Finding knowledgeable, unbiased consultation in these areas was reported as problematic.

By 1990, it is estimated that three fourths of these human service agencies will be using microcomputers.

Discussion

This study surveyed microcomputer utilization and training needs among private nonprofit human service agencies. The results indicate that use of microcomputers continues to expand rapidly. Presently, approximately half (48%) of agencies own microcomputers. By 1990, it is estimated that three fourths of these human service agencies will be using microcomputers. Given the present and predicted use of microcomputers in human service agencies, computer literacy for human service workers should be treated as an essential skill for today, not the distant future. The vulnerability of agencies to disruption from loss of their few computer trained personnel can only be eliminated through widespread computer competency among human service professionals.

Given the present and predicted use of microcomputers in human service agencies, computer literacy for human service workers should be treated as an essential skill for today, not the distant future.

Approximately half of the agencies who presently do not utilize microcomputers have plans to purchase within 5 years. It is clear that agencies about to purchase microcomputers have higher expectations about their use than agencies presently utilizing microcomputers. It is possible that administrators and board members are now better educated with regard to microcomputer applications and have available more powerful hardware and software systems with which to implement their plans for microcomputer utilization. It is also possible, however, that agencies have been given high expectations through hearsay stories and advertising campaigns without a clear understanding of the costs, organizational disruption, or personnel requirements necessary for optimal utilization of their systems. The problems reported by agencies as well as my personal experience in consulting with agencies indicate that the latter is more often the case.

It is clear that agencies about to purchase microcomputers have higher expectations about their use than agencies presently utilizing microcomputers.

Very few agencies believe that they will utilize microcomputers for interagency networking or decision support functions. The technologies involved are newer and more expensive. Many agencies may not yet be familiar with the existence or potential of these functions. In addition, in an era of budget retrenchment in the human services, these functions may be viewed as luxuries which are not essential to efficient management of the agency.

There is evidence, however, that agencies are becoming interested in interagency networking. The second highest interest in workshops and training among MUA was in the area of interagency networking. There was little interest in

the area among agencies who had not yet purchased their systems. These agencies were more concerned with word processing, record keeping and administrative functions. This suggests that interest in networking may be developmental in that agencies are initially interested in functions which facilitate their own internal operations and, when these are in place, will later be ready to use their computers for less central operations.

There was also very little interest among agencies in decision support systems. It may be that decision support systems are still so new that most agencies are unaware of their potential or that, like networking, they are considered a luxury rather than an essential. Decision support systems are at the heart of helping direct service workers improve services to clients. Very few agencies are developing decision support systems for their workers and, judging from their training interests, there appears to be little interest in doing so in the near future. The development of software applications for human service needs is dependent upon computer competency by human service professionals. Those outside the human service arena focus on business and administrative needs. They generally do not understand the language or the information requirements of direct service practice. Computer competency for human service workers must go beyond basic accounting and database functions. It is necessary to develop human service professionals capable of understanding and developing decision support, expert system, and telecommunications applications.

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Microcomputer training for human service personnel was provided by a variety of sources. A "computer dealer" was listed as the most frequent response while "University" was mentioned least often. Computer dealers are generally more familiar with business needs, such as accounting and word processing than with the needs and functioning of human service agencies. This may explain, in part, why most microcomputer functions in human service agencies are geared toward administrative needs. Agencies need microcomputer training from those with an understanding of human services. Many universities offer social work and related degrees, and a growing proportion of these are offering courses in information technology and human services. There does not appear to be much outreach on the part of these university programs to provide training to local agencies.

Another training possibility has been largely overlooked. A few agencies reported that they could provide consultation to other agencies with regard to all microcomputer functions with the exception of decision support systems. What is needed is a coordinating broker who could match agencies needing assistance with those capable of providing

it. This might be done as a local self help network, a fee for service basis, or both. Approximately one-fourth of all agencies indicated that they would be interested in joining such a network and the vast majority of the remaining agencies were interested in receiving further information.

A few agencies reported that they could provide consultation to other agencies with regard to all microcomputer functions with the exception of decision support systems. What is needed is a coordinating broker ...

Security and Confidentiality

Approximately three-fourths of agencies with microcomputers maintain client information (e.g., case records, mailing lists) in their computers. Of these, the majority attempt to insure security and confidentiality of their information through use of password protection for access and/or utilizing code numbers instead of clients' names. Fewer than 10% of agencies, however, have an ethics committee to review policy and procedures related to use of computerized data. The inherent dangers and potential problems involved in computerized record keeping have been described (Logsdon, 1985; Large 1984; Berger, 1975; Westin, 1966). These include inadvertent error in data entry, failure to update and/or modify records, use of data for purposes other than initially intended, disclosure or transfer of data to another person/agency without consent, failure to acknowledge the extent of information maintained on a computer system, and failure to advise clients of their rights with regard to their (computerized) records. Given the ease with which data can be maintained and transferred and the increasing interest among human services agencies in interagency networking, ethical guidelines and review committees should be established by all agencies maintaining individualized client records. Both agencies and clients are in need of education regarding their rights and responsibilities in this area.

Problems/concerns

Human service agencies described a number of problems regarding their use of microcomputers. These included: difficulty in finding training and consultation; the need for hardware and software upgrading; dependence on a few staff who understood the system, and difficulties associated with expanded use of their systems. These difficulties are similar to organizational disruptions experienced by other businesses and have been previously discussed in the literature (Schoech and Schkade, 1980). Agencies, however, are generally unaware of what to expect in the developmental changes associated with increasing use of computers. There is great need for consultation to agencies by human service professionals who are knowledgeable about both microcomputer systems and human service agency functioning. Universities have thus far played only a marginal role in this area and could do much to provide continuing education and consultation.

Conclusion

The microcomputer may soon be as ubiquitous as the telephone in human service agencies. In order to take full advantage of the microcomputer's potential to improve agency services, agencies must expand beyond the business model of computer as administrative aid. This will necessitate greater involvement of human service educators and professionals in the development of service related applications, the training of direct service personnel, and the development of interagency consulting and self help models. At the same time, the human services must not lose sight of the ethical issues involved in implementing their systems or their moral commitment to protect client confidentiality.

Agencies... are generally unaware of what to expect in the developmental changes associated with increasing use of computers.\$

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Impact of Computer Technology on "People Processing" and "People Changing" Social Welfare Organizations by John M. Gandy, DSW

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Abstract

This paper reports some of the findings of a larger study of the impact of computer technology on 8 social welfare organizations in a Canadian Metropolitan area. The organizations included: A local public welfare department; 2 child and family treatment organizations; A community center, a treatment center for physically handicapped children; A treatment center for adolescents with behavioral problems; An information and referral service for immigrants; and A district office of the National Parole Board. Data was collected through questionnaires administered to staff (374) at all levels, interviews with staff and board members, participant observation and reviewers of relevant organization records.

One of the criteria used to select the organizations studies was the expected outcome of the service. This was operationalized using Hasenfeld's dichotomy of social welfare organizations on "people processing" or "people changing." Half of the organizations selected were in each group or it was anticipated that there would be significant differences in the impact and use of computer technology in the two groups of organization, more specifically, this research tests the proposition that staff in "people changing" organizations will have more concern and anxiety about the impact of computerization on the organization and this will be reflected on its impact on the organization. The concerns of staff in "people changing" organizations were expected to reflect their anxiety about issues such as possible replacement of humanistic with technical values, loss of professional discretion, threats to confidentiality of chart records and changes in the staff-chart relationship.

One of the major findings is that the impact of computer technology on both types of organizations was less than expected; however, the impact on "people changing" organizations has been minimal. Staff in the "people processing" organizations made more use of computer technology in the delivery of service to clients. In neither type of organization has the use of computer technology challenged the established power structure, changed existing staff relationships, greatly improved the accuracy of statistical records, or changed the pattern of service delivery as had been widely predicted in the literature.

Introduction

Computer technology can be destructive or constructive depending on how it is used. However, the impact of this technology cannot be predicted from its logical design alone; one must analyze how well it fits the needs, interests and existing practices of those using, or likely to use, this technology. Therefore, it is not surprising that the literature on computerization in social welfare organizations devotes so much attention to the potential of computer technology for introducing changes that will place some of the basic social work values and traditional practices at risk (Cohen et al., 1979; Nutter, 1983; Williams, 1983; Karger, 1985).

While some of the anxiety may seem to be an overreaction, or misplaced, it rests largely on concerns of some staff that their professionalism and commitment to social work values and ideology are threatened (Gripton, n.d.). This perceived, or actual, conflict base of social work is seen as an important difference between social welfare organizations and business organizations and one that impinges directly on the introduction and use of computer technology in social welfare organizations (Noah, 1978; Newman and Tarem, 1978; Sicar et al., 1983). It would seem to follow that if the philosophy and practice of a social welfare organization is based on the values and ideology of professional social work the impact of computerization will be qualitatively and quantitatively different from social welfare organizations with less commitment to these values. This proposition has guided the analysis in this paper in which the expected outcome of service provided is used to classify social welfare organizations and to compare the impact of computerization. It is assumed that the philosophy and ideology of organizations providing treatment or clinical services will be closer to the humanistic perspective of social work than those organizations whose primary function is to help people in more material and instrumental ways.

I am indebted to Hasenfeld for the concept of "people processing" and "people changing" organizations which is used here to classify organizations according to anticipated outcome. People processing organizations "...attempt to change their clients not by altering basic personal attributes but by conferring upon them a new set of circumstances (Hasenfeld and English, 1974, p. 5). People changing organizations "...attempt to alter directly the attributes and behavior of their clients through the application of various modification and treatment technologies" (Ibid.).

The decision to use expected outcome as the independent variable in the analysis of the impact of computerization on social welfare organizations is based on the assumption that in "people changing" organizations staff will have more anxiety about the possible replacement of humanistic with technical concerns and a commitment to individualized decision-making. Also, the concerns expressed in the literature about the negative impact of computer technology on professional discretion, confidentiality and worker-client relationship would most likely be found in "people-changing" organizations that employ professionally trained social workers at all levels. With regard to the latter point, it is assumed that social work education has resulted in socialization to the profession that includes values and ideology which are seen to be incompatible with the structure and measurement required for computerization. Finally, it is assumed that computer technology will be most useful to "people processing" organizations where decisions are likely to be based on criteria that are specific and quantifiable.

Sample of Organizations

The 8 organizations, whose staff provided the data for this research, were selected from a group of 51 organizations in a Canadian Metropolitan Area who indicated, in 1984, that they were using computer technology, providing a direct service, and whose staff complement included at least 10 full-time direct service staff. Half of the organizations selected for participating in this research were "people processing"

and half "people changing." For both groups of organizations an effort was made to select organizations at different levels of computer use. The "people processing" organizations included the following: a regional public welfare agency; a district office of the National Parole Services; a community center; and an organization providing information and referral services to immigrants. Three of the four organizations are supported entirely by government. The number of full-time staff ranged from 24 to 56. The "people changing" organizations included the following: A clinic for children with severe behavioral disorders; An agency providing counseling and protective services for families and children; a treatment center for adolescents; and a treatment center for physically handicapped children. Two of the organizations are financed entirely by government and two jointly by government and the private sector. The number of full-time staff ranged from 30 to 100. Computer technology had been used in the "people processing" organizations from 1-9 years and in the "people changing" organizations for 1-5 years.

Data for this research were collected by questionnaires administered to all levels of staff. These questionnaires were designed to elicit information on the attitudes and perceptions of staff and factual information on the use and impact of computers in their respective organizations. Approximately two thirds of the staff complement in each organization completed questionnaires.

A total of 3/4 staff completed questionnaires, 220 in the "people processing" and 154 in "people changing" organization. Of the 220 respondents in "people changing" organizations 14% were community college graduates in social welfare or child care, 12% were B.S.W.s and 3% M.S.W.s. Of the 154 respondents in "people processing" organizations, 5% were community college graduates, 9% B.S.W.s and 15% M.S.W.s

In both "people processing" and "people changing" organizations approximately two-thirds of the staff... reported that they used computer generated output.

Use of Computer Generated Output

In both "people processing" and "people changing" organizations approximately two-thirds of the staff, who completed questionnaires, reported that they used computer generated output. The questionnaire asked for information on the frequency of use of computer generated output to assist in the following 10 organizational activities: budget and manage resources; monitor client services data; develop new services/programs; revise existing services; refer clients to other departments or agencies; monitor staff performance; conduct research; formulate policy; determine eligibility for agency service; and determine amount of financial assistance. The frequency of use reported for both types of organizations was not significantly different for 8 of the 10 activities with the most use reported for monitoring of client data and for budgeting and managing resources. There was a statistically significant difference in the use of computer generated data for two activities—refer clients to other departments or agencies. The staff of "people processing" or-

ganizations made greater use of computer generated data to assist them in both activities. It should be noted that in both types of organizations the respondents reported the least use of computer generated data for planning, research and policy development.

Staff were asked to assess the impact of computerization on a range of organizational responsibilities on a 5 point scale from strongly positive to strongly negative. This was reduced to a 3 point scale of positive, none, and negative impact. The following were the organizational responsibilities staff rated: client records; internal statistical reporting; case management; supervision; programs management, financial management, external reporting; policy making; and service to clients. The ratings in both types of organizations were comparable for 5 of the 9 organizational responsibilities. The impact of computerization was seen as most positive in both types of organizations for internal statistical reporting, case management and financial management. The impact was seen as least positive for policymaking and supervision. There was a statistically significant difference in the ratings on 3 organizational responsibilities: client records, external reporting, and service to clients. Respondents in "people processing" organizations were more positive than those in "people changing" in their assessment of the impact of computerization on these three responsibilities.

Staff reports of the extent and nature of the use of computer generated data indicate that the pattern of use in both organizations was very similar. The respondents reported that the most use is made of computer generated data for administrative purposes at the operational level. This is consistent with the experience of knowledgeable observers who have found this to be a pattern of use for social welfare organizations (Glastonbury, 1985; Trute et al., 1982; Zuboff, 1982). However, one important difference was in the area of service to clients. Staff in "people changing" organizations reported that they used the computer generated data less in service to clients and service delivery.

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Professional Values & Computerization

The view that the computer is anti-humanistic and therefore in conflict with the value system of professional staff, particularly social workers is one that has considerable support in the literature (Abels, 1972; Sullivan, 1980; Gruber, 1974; Zuboff, 1982; Turkle, 1980). As pointed out earlier the "people changing" organizations in this research have a higher proportion of professionally trained social workers, who occupy positions at all levels, than do "people processing" organizations. It was thought, that the philosophy of "people changing" organizations with reference to service to clients would be similar to that of the social work profession. If so, it would seem to follow that in "people changing" organizations staff will find computer technology not to be compatible with their professional values and norms. Data

were collected on staff assessments of the impact of computer technology on 4 areas of work with clients that might be different for staff in organizations with a predominantly professional orientation. These areas are:

- Staff discretion in the provision of service to clients;
- Amount of control staff has over their work;
- Confidentiality of client records; and
- Individualization of clients.

Respondents were asked how computerization affected the amount of discretion they exercised in making decisions and in the amount of control they had over their work. In both "people changing" and "people processing" organizations a large majority reported that computerization had no impact on their exercise of discretion. However, a larger proportion of staff in "people processing" organizations reported that there had been an impact on their exercise of discretion in both positive and negative directions, this again would seem to result from the greater use of computer generated data at the interface with clients. On the issue of control of job there is a statistically significant difference in the responses. The proportion of staff in "people processing" organizations that reported they had more control of their jobs following computerization was much higher than for "people changing" organizations where the majority of staff reported no impact. This difference would suggest that staff in "people processing" organizations have learned to make more use of its potential for "getting the job done."

The following statement dealing with individualization of clients was included in the questionnaire with the request to indicate whether the respondent felt that it was justified:

One of the fears expressed about the use of computer technology in human services is that it discourages dealing with the client as an individual. On the basis of your experience with this organization do you think there is any justification for this fear?

The difference in the responses in the two types of organizations was statistically significant. However, the difference was not in the direction anticipated. A surprising 77% of staff in "people changing" organizations responded that there is no justification for concern as compared with 60% in "people processing" organizations.

The difference in the responses in the two types of organizations was statistically significant. However, the difference was not in the direction anticipated. A surprising 77% of staff in "people changing" organizations responded that there is no justification for concern as compared with 60% in "people processing" organizations. One possible explanation for this unexpected response in the "people changing" organizations is that with the more limited use of computer generated in service to clients staff in these organizations are responding to "what is" rather than "what might be." To get at the issue of individualization of clients from another perspective staff were asked whether there is a problem in coding client data for the forced choice clas-

sification that is required to input computers. A majority of staff in both types of organizations reported that it presented a "slight" problem. It was considered to be a serious problem by 9% of the respondents in "people processing" and 12% in "people changing" organizations. When the results of the surrogate measures of individualization of clients are examined, there is little difference by type of organization but what difference there is suggests more concern in "people processing" organization.

The threat computerization posed to the confidentiality of client records is a recurring and consistent theme in the literature on computerization in human service organizations (Dreamer, 1986; Holbrook, 1986; Goodfiend, 1979; Glastonbury, 1986). Among the major issues are control of access to stored information and controls on the disclosure of personal data. The question of protecting confidential client information is seen to be of special concern because of the nature of the information collected and the ethics governing the worker-client relationship. To get staff reaction on this issue they were asked to indicate their level of concern about the possible danger of breach of confidentiality through unauthorized access to client data stored in the computer, limitations on the storage of client data and policy on access to information in the computer. In both types of organizations the majority of staff expressed some concern about possible breaches of confidentiality of client data stored in the computer. A slightly higher proportion of staff in "people processing" organizations expressed a "lot of concern." There was a significant difference in the response to the question, "Is there any kind of client data that should be stored in the computer after a case is closed?" A substantially higher proportion of staff in "people changing" organizations did not think restrictions were necessary. There were also differences between the two types of organizations in their response to questions about the policy of their organizations regarding access to data in the computer. Almost half (47%) of the respondents in "people processing" organizations reported that they were satisfied with the policy of their organization, the comparable proportion for "people changing" organizations was about one-third (32%). However, the major difference was in knowledge of their organization's policy on access to client information, almost two-thirds (61%) of the respondents in "people changing" and one-third in "people processing" organizations reported that they did not know the policy of their organization on access to data in the computer. The responses of staff in both types of organizations indicate that although more concern was expressed by staff in "people changing" organizations, the concerns of staff in both types of organizations are minimal about the threats posed by computerization to the confidentiality of client data.

Costs/Benefits

A majority of staff in both types of organizations reported that their attitude toward computerization was positive at the time it was introduced and that at the time data were collected they were even more positive. It is, therefore, not surprising that when asked about the costs/benefits of computerization about half the respondents in both organizations reported that overall there had been more benefits than costs for the organization. When asked about the

costs/benefits for groups of staff, clients, and the board, there were two groups for which the differences in responses were significantly different—direct service staff and clients. With respect to direct service staff 58% of the "people processing" respondents reported more benefits than costs compared with 43% for "people changing" organizations who more frequently reported more costs than benefits. Almost half (48%) of the respondents in "people changing" organizations assessed the costs and benefits to be equal for service to clients, the assessment of a comparable proportion (51%) in "people processing" organizations was that computerization produced more benefits than costs for clients.

...the concerns of staff in both types of organizations are minimal about the threats posed by computerization to the confidentiality of client data.

Productivity

The respondents were asked to rate the impact of the computer on their productivity. There was a significant difference in the perceptions of respondents in the two types of organizations, almost half (49%) in "people processing" organizations reported gains in productivity while more than half (55%) of those in "people changing" organizations reported that the computer had no impact on their productivity. In this regard it is of interest that the accuracy of records following computerization was rated by 34% of respondents as fair or poor in "people processing" organizations, the comparable percentage for "people changing" organizations was 51%. This finding is supported by the assessment of one-third of the staff in both types of organizations that the manual record keeping system produced more accurate client records than the computerized system.

Summary and Conclusions

The major difference between the impact of computerization on "people processing" and "people changing" social welfare organizations that emerged from this analysis was that the former were more responsive to the technology and made greater and more consistent use of it in the delivery of service to clients. While this outcome was expected the response of staff in "people changing" was not as anticipated. Although the reasons for this are not clear, two possible explorations seem worthy of consideration.

1. The use of computer technology almost exclusively for administrative purposes meant that there was no challenge to the traditional worker-client relationship, or to patterns of service delivery as the established power structure in the organizations structure. Thus the staff, particularly the direct service staff in "people changing" organizations did not regard computerization as either a clear and present danger or a potentially valuable tool and responded by avoidance which may represent a form of resistance to the technology.

2. The strength and pervasiveness of the value base and ideology of professional social work practice has been overestimated. Staff are pragmatic in their response to this in-

novation and are taking a "want and see" attitude. This is due to, or tempered by, the widespread use of micro computers which has served to dispel much of the mystique and fear surrounding computer technology.

Both explanations have merit but neither is satisfactory because the organizations have not taken the step of implementing, or trying to implement, the use of computer generated data to assist staff, in a meaningful way, to deliver service. The hypothesis advanced in this paper should be tested in organizations where staff have a decision that goes beyond the use of computer generated data for administrative purposes. §

The major difference between the impact of computerization on "people processing" and "people changing" social welfare organizations... was that the former were more responsive to the technology and made greater and more consistent use of it in the delivery of service to clients.

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The Design of Information Systems for Practitioners in Social Intervention Agencies, by Rami Benbenishty

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Abstract

This paper analyzes the information needs of practitioners in social intervention agencies and describes an approach to the design of information systems to meet these needs. An application is presented to illustrate the approach and its potential benefits. In the analysis of the information needs of practitioners in agencies the paper identifies three main domains: population, interventions, and outcomes; three levels of analysis: descriptive, correlational, and temporal; two units of analysis: the single case and aggregated data, and two time frames: current and cumulative/historical. The paper presents an information system designed to meet the information needs of caseworkers in a children residential facility. Outputs of the system are presented to illustrate the potential uses of the information. In the discussion it is suggested that the outputs of such systems should stimulate changes in the ways clinicians use information. The issue of control over the information is addressed in the discussion.

Introduction

In the last two decades many attempts were made to introduce computers and information systems into the human services (Schoech, 1982; Schwartz, 1984). These systems, however, were designed with the needs of administrators and policy makers in mind, rather than of clinicians (Craig, 1984). In order to design and implement information systems that will inform clinicians and will be used by them, it is essential to analyze the information needs of clinicians engaged in direct practice and to tailor the outputs of such systems to meet these specific needs. The aim of this paper is to analyze information needs of practitioners in treatment agencies, and to present an information system designed to meet the needs of practitioners in a residential treatment facility for children.

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Information needs of practitioners in intervention agencies

The focus of this paper is on information regarding the clients and the direct interventions utilized and the clients served by the agency. In the analysis, two consumer groups are considered: the individual practitioners and the "clinical

leadership" of the agency (i.e., clinical supervisors and directors). A number of information domains can be identified:

Population

This domain consists of information about demographic characteristics such as sex, age, education, race, family composition, etc. Information of more diagnostic nature is also important. This information may pertain to diagnostic nosology, certain structured assessments (such as a family assessment (Olson, Russel, & Sprenkel, 1983). A special category of information pertaining to the population is that of stated problems, complaints, needs, etc.

Interventions

This domain relates to information about the unit of intervention, types of interventions and techniques, length of contact, financial and other resources given to the client, referrals to other agencies, etc.

Outcomes

This domain relates to any information about issues that can be interpreted as outcomes of the agency's intervention. It pertains to clients, "practitioners," and others assessments of outcomes, made at various points in time throughout the intervention and in follow-up contacts.

The processing of information

The input from the various domains have to be processed and analyzed in order to be used in clinical judgment. Three basic types of analysis can be identified. The following sections describe each of these types, and illustrate briefly the ways in which information from each domain is processed to meet information needs.

Descriptive Analysis

Information collected in each of the domains can be processed to generate frequency distributions. In the domain of population characteristics, ethnicity, race, age, family composition, residence area, and other related attributes, may all be important to decision and policy making in an agency. In some instance the distribution of these variables will alert the agency to severe over or under-utilization of services by a specific group, with the ensuing social consequences. In other instances, factors such as language spoken by clients, age or area of residence may have direct implications for service delivery and staff training.

Examination of frequency distribution of interventions can be very informative. The breadth of the interventions and the relative frequency of each category may have direct impact on in service training and on policy reviews. For instance, a frequency distribution of interventions carried out by a welfare bureau may show that high percentage of interventions are classified as "referrals to other agencies." This may prompt training focused on improving skills in that area, restructuring certain procedures to improve screening and referral before clients are seen by a professional, identification of the main targets for referrals in order to facilitate client movement between agencies, etc.

Frequency distribution of outcome measures are needed in order to assess what is the status of clients' problems, complaints, and perceptions of outcomes. These data can be most useful in identifying in which areas there is progress in

the clients' situation, and to what extent are the intervention goals being achieved.

Relational Analyses

The various pieces of information collected in each of the domains can be juxtaposed to give a picture of the relationships between the various domains. For instance, the relationships between client characteristics and outcomes can help identify who are the clients benefiting most from the agency's services and with which clients the agency has less success. Similarly, the relationship between the intervention used and the outcomes can be indicative of which techniques are consistently related to more positive outcomes. Under favorable circumstances, studying the interrelationships between population characteristics, interventions, and outcomes can help provide the practitioners with an indication as to what intervention works best with which clients to achieve specific outcomes (Kiesler, 1981).

Temporal

A temporal analysis of the information has two time frames: within an intervention, and cumulative/historical perspective. In the first time frame the information about each client is processed so that changes in problem areas are monitored throughout treatment. Time series graphs were found most useful in depicting changes during intervention (Bloom & Fischer, 1982; Levy, 1983).

The second time frame is that of studying changes over time in all domains. Thus, for instance, agencies need to know about changes in their client population composition over time in order to adjust their interventions. Temporal analysis of data on interventions may also reveal shifts in practice procedures. Further, changes in outcomes achieved at various points in time may be most useful for program evaluation purposes.

Units of Analysis

The processing of information can be done for two units of analysis--the individual client, and aggregated group of clients. For each client information can be processed to provide a time series analysis of changes in certain problem areas. In addition, complex assessment data can be processed to provide a profile of the specific client unit. For instance, responses provided by multiple members of the family on the FACE questionnaire (Olson, 1983) can be processed to provide a visual picture of the specific family, and the interrelationships between the members' perspectives.

Information about the entire client population, or about sub-groups of clients, can be most useful to the clinical leadership of the agency. Descriptive information about clients, interventions and outcomes achieved with the client population may serve as a basis for planning future programs.

It should be noted that for practitioners the comparison between information about their individual clients and what is known about the whole client population can prove most useful. For instance, a comparison between a client's score on a certain test with the average score by other clients at that agency can serve as a basis for assessment of the severity of the case. Comparing a specific client's degree of improvement with some norms established by a relevant comparison group will help determine degree of success in the specific

case. This type of comparisons can be facilitated by analyzing information across groups of clients and rank ordering clients on relevant dimensions.

Information System at Methodist Children Village

The above analysis of information needs of practitioners in social intervention agencies was the basis of an information system in a residential treatment facility for children. Methodist Children's Home Society (CHS) is a comprehensive child welfare agency which provides 1) residential treatment, 2) educational day care, and 3) adoption, foster care, and pregnancy counseling services. The Residential Program, which is the focus of this paper, provides treatment to 50-55 children who live in 8 cottages on the grounds. The children range in age from 6 to 13. Treatment for the children is provided in the cottage by a team of child-care workers and the cottage supervisor. The information system was designed mainly for the needs of the 6-7 caseworkers and their supervisors. This paper will present only elements of the information system that are directly related to the analysis of information needs presented above. Some of these elements are in the process of being implemented whereas others are already installed.

The system pertains to the three domains described earlier.

Population

In order to collect information about the children and their families, a content analysis of the children's files is conducted. Data collected include: Demographic data (e.g., gender, race, age), intake information (e.g., referral source, legal status), presenting problems, and family background (e.g., birth order, number of siblings).

Interventions

The workers report their contacts with the child and his/her family and describe their frequency, timing, and type (in-person, telephone contact, etc.). These reports are aggregated per month. In addition, we are in the process of generating a list of specific techniques used by the workers in therapy sessions. Examples of the techniques that are being identified, defined, and illustrated include: using unstructured play, talking about dreams, analyzing consequences of behavior, contracting, and role playing. When this work is completed, the workers will describe in their quarterly report which techniques they have used with the child during the last three months.

Outcomes

The Child Behavior Checklist: The CBCL (Achenbach, 1978) is a checklist developed originally for parents to report on their children's social competencies and behavior problems within the past 6 months. At MCHS, each worker uses the Behavior Problem part of the checklist at the end of each month to describe the child's behavior in the past month. Their reports are based on their observations and on consultation with other staff working with the child, especially cottage supervisors. The 118 items in the checklist form 10 scales (e.g., Depression, Uncommunicative, Social Withdrawal, and Aggression). Achenbach and his associates

(Achenbach & Edelbrock, 1983) have conducted extensive studies to validate this checklist.

Short term goals: In their quarterly reports, caseworkers identify the child's short-term goals for the coming 3-month period, using a special format. First, they specify the child's situation "right now" (the baseline) and then they describe the child's situation if the goal would be attained (the goal-line). These end points are written in specific and concrete terms to create a continuum extending from 0 (baseline) to 4 (goal-line). When appropriate, additional anchoring points to describe "some progress," "worse than baseline," or "surpassed goal" are added. In the following quarterly report, the worker indicates where the child stands on the continuum between the baseline and the goal-line.

Processing of Information: Descriptive analyses of population attributes, interventions and outcomes are being conducted regularly and are reported to the staff. In addition, attempts are being made to find interrelationships between the various domains. The main focus of the system, however, is to provide timely reports to monitor children's status and progress. These reports are generated each month and are given to each caseworker and their supervisor. These reports can be classified according to which is the unit of analysis.

The individual child: The workers use the checklist to report on the child's problems. The information system scores the checklist and generates a graph describing the "problem profile" of the child in the past month. This allows the staff to see the areas in which the child has greater or fewer problems.

The system also provides time-series information. The child's scores for the past several months are graphed to allow identification of trends over time, such as a picture of a child's scores on the problem scales for 5 months period where changes can be seen. Caseworkers then interpret the graph, trying to identify the significant events that can explain these changes.

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Across groups of children: The system generates outputs that present the scores of each individual in a group of children. This presentation allows a comparison between each child and a relevant reference group drawn from the MCHS population. When the scores of all the children on a certain scale (or the total score) in MCHS are rank-ordered and the children listed, it is possible to identify which children seem to have more problems and which seem to have fewer. Such reports can help identify who are the

children that are extreme in their scores in order to help treatment planning.

For instance, if a child is found in one of the extremes of the list month after month it may trigger a discussion as to whether the child should remain in the facility.

Scores are also presented for all the children in a caseworker's caseload. This helps in setting priorities and in caseload management. Similarly, in the cottages a graph describing all the children in the same cottage help in identifying the children who exhibit behavior that is very different from the other children in the same cottage.

Aggregated: The system generates outputs that describe groups of children. First, the village as a whole is described. This allows identification of the more prevalent problems in the agency and comparison of MCHS to other facilities and to national norms. The data are also aggregated by cottages allowing a comparison across cottages in terms of specific problems areas, or in terms of the overall degree of problem behavior. Decisions as to training, or reallocation of children may be influenced by realizing that a certain cottage has a concentration of children that has a specific difficulty. A graph is presented to the supervisor of the cottage personnel and to the other members of the clinical leadership. This figure indicates which cottages have a concentration of children with a specific problem (aggressive behaviors in this example) and which cottages have fewer problems. Sometimes this report may have direct impact on changes in allocation of children to cottages. It may also have effects on identifying training goals.

In addition, the interrelationships between population characteristics and outcome data are being studied. At this stage we are examining the relationships between the children's family background and history of prior placements and their progress in MCHS. If, indeed, consistent relationships are found they would have important consequences for admission and for treatment planning.

Discussion

Our experience in designing and implementing this information system raised many issues and dilemmas. In this context two of these general issues will be discussed. Technology is often considered an aid for solving existing problems. My approach is that information technology should create new problems. The new possibilities should stimulate clinicians to ask how can they change their set ways of thinking and of using information, in order to take advantage of the new technology. Thus, rank ordering clients on a certain dimension, or comparison of progress levels of certain sub groups of clients may not be of interest and not considered an information need by clinicians today. But as these types of outputs become more readily available, clinicians may change the ways they make clinical judgments in order to take full advantage of the new technology. Our experience in MCHS is that some outputs of the system are readily accepted as they respond to felt needs of the practitioners. Still, in some cases the availability of other outputs stimulated the caseworkers' interest and some of them found these reports useful in their practice. Thus, an interaction is envisioned in which clinicians' information needs initiate technological changes, and these changes, in turn, spur changes in the way clinicians are used to process information.

The new possibilities should stimulate clinicians to ask how can they change their set ways of thinking and of using information, in order to take advantage of the new technology.

Information is intimately related to control. Clinical information systems may increase the control clinicians have over their environment. Paradoxically, however, these systems may also increase the control their superiors can exert over the clinicians. The more extensive, accurate, and efficient the system, the easier it is to pull out information about individual clinicians. This is a major challenge in attempts to design and implement clinical information systems. If practitioners see them as control mechanisms they would falsify data in such ways as to render these systems useless (Walker, 1972). In the present example, at a certain point in time the caseworkers felt that a management information system operating at the agency was used in a punitive manner to limit their professional discretion. This led immediately to suspicions and fears as to how the clinical information system may be abused to increase administrative control. It is a major challenge for the future to balance the need for accurate, timely, and comprehensive information, with securing the cooperation of professionals, who are not willing to, and should not, lose their professional autonomy.

Clinical information systems may increase the control clinicians have over their environment. Paradoxically, however, these systems may also increase the control their superiors can exert over the clinicians.\$

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A Medical Model Approach to Utilizing Information Technology in a Multidisciplinary Setting by Carolyn S. Hughes, Robin L. Hansen, Gary B. Hughes, Gordon L. Ulrey

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Introduction

The Child Development Program of the University of California, Davis, Medical Center needed to grow from a limited clinic experience to a complex service delivery system. This system envelops other academic institutions, practicing professionals and students from a variety of cognates and systems, tertiary agencies in a 23 county region of Northern California, and clients/patients and their families. Staff includes professionals in medicine and other cognates with: multidisciplinary training; skills with an emphasis on information technology applications; database design experience; or strong statistical/research backgrounds utilizing computer technology.

Over 30 data bases were designed at the outset to aid in administrative tasks such as billing and client tracking systems, and to provide matrices of clinical observations, diagnostic outcomes, developmental milestones, and other clinical applications. Some of these initial data base designs have become the frameworks for research projects evaluating the developmental progress of high risk neonates over time; projecting developmental outcomes for infants and children at risk; and comparing the reliability of various assessment tools.

A major step to interact and integrate with other state and local agencies was to begin a networking process. A series of multidisciplinary working conferences are being sponsored to design and implement a collaborative community model for the local region. Out of these conferences will come a uniform vocabulary, data collection terminology and formats, and innovative concepts to effectively share client data while maintaining client confidentiality and right to privacy. The merits of such a system are being discussed in terms of a more beneficial and comprehensive use of community resources.

The potential and expectations of this project are for staff to fully appreciate the need for computer accessibility to patient records; train staff to respect both the scope and limitations of the patient technology; be aware of the positive potentials for research; and to be sensitive to this technology's powers and pitfalls.

Information technology is available, inexpensive, "user friendly" and offers an ever-increasing array of specialized software options. Utilization in most medical settings has been sporadic and primarily limited to clerical functions (word processing), billing, and basic record keeping. All of these are valid uses of the technology, but the potentials are

seldom fully appreciated, especially by professional personnel.

Like any new methodology, applied computer literacy and software utilization are learned tasks that only improve with repetitive use and sustained exposure. Taking time to become adept appears to be a major stumbling block for professional use; the technology presents as a chore, rather than a tool.

Our program personnel decided to become proficient in PC utilization and software applications in pediatric health care and research. We have access to IBM and Zenith hardware and a broad range of proprietary software. Our focus is on in-clinic utilization for health record and data base access, data base application for research, and student/housestaff training. We also have Management Information System (MIS) capability in our program and can interact with the University mainframe system as needed.

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Program Goals

The Child Development Program is a demonstration project and is being implemented incrementally. Until the curriculum and training components are officially integrated into the various schools they can only be offered on an elective basis. However, as medical students rotate through the clinics under the Child Development Center umbrella they will routinely be exposed to a multidisciplinary team in action, research oriented staff, pre- and post-evaluations on a PC system and an interactive data base system.

The Child Development Center is designed as a complex service delivery system representing a multidisciplinary team: developmental psychologist; social worker; nurse specialist; education/research specialist. The program is under the auspices of the School of Medicine, University of California, Davis, and housed at the University of California Davis Medical Center.

One of the major goals of the program is to develop and implement an interdisciplinary internship program for students at the University of California, Davis and at California State University, Sacramento in the cognates of medicine, social work, nursing, education, special education, and psychology. The intent is to design a series of classes and training seminars, based on the application of an interactive computer system. As discussed by Neu [1] and Westerhoff et al. [2] there is a need and a place for computer literacy in medicine. Students should be exposed to the technology in as many courses and settings as possible. Neu refers to this approach as the "computerthread." The program will be designed to offer computer access to pre- and post-evaluations, training modules, and supporting bibliographies at the clinic site. A network system to access these items through various remote arrangements from other sites will also be available.

Another primary goal of the program is to develop a separate research/course work curriculum based on a PC

network system. The program of study will allow students to interact with statistical and data base programs that are research oriented and will expose students to working with a main frame computer system available at the University of California Davis campus. This will add a further dimension to the students' research training, while expanding the research data base for the School of Medicine.

Curriculum Design

The curriculum focus is two fold. First, to discuss and enhance the team concept and to develop students who both desire and are capable of being team players. Second, to introduce and train students in computer utilization and information technology applications.

The curriculum being designed is comprehensive in nature. Courses will include: introduction to computers (hardware and software); introduction to information technology applications; medical and research applications; data base design; and computer lab time. There will also be specific courses illustrating advanced data base design and programming. Seminars will be presented on the team concept; how the interdisciplinary team areas of expertise collide, overlap, and/or blend; and patient confidentiality and record access, especially by computer networks. Courses will be taught by faculty and staff from the Child Development Program and other participating institutions.

In addition to lab experience and training seminars the curriculum will include discussions on the ethical and practical concerns for medical professionals utilizing this technology. Masuda's [3] view of the future society needs to be explored and discussed and the role of medicine and other related professions needs to be evaluated within his context. Other views and philosophies also need to be discussed and compared. This technology will exist in the future — the question is how will we react and interact with the technology, both as individuals and as professionals? The curriculum will reflect opinions and philosophies from each of the participating disciplines in regards to information technology and its applications.

Courses will be designed to address global issues such as Masuda's Information Society, the future of computers in general, and the future of computers in medicine and human services.[4,5,6,7,8,9] The focus of these courses will be the role of physicians and other health care professionals in keeping up with the technology and utilizing its benefits while being aware of the dangers and the possible misuses it presents. Patient/client confidentiality, professional culpability issues, utilization of the technology in treatment or therapy, and the future impact of computers on service delivery in the medical setting are all primary topics for discussion.

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Training Components

Outreach clinics, throughout Northeast California, are being organized. For this part of the internship program, portable PCs will be utilized to access records and to enhance the communication and direction of professors housed at the medical center campus and other locations.

Outreach teams will consist of a multidisciplinary staff and each member will be expected to access information and data from both the hospital and clinic sites as well as from the Medical Center. Each team member will also be able to communicate with supervisors and/or other professionals from the outreach sites.

Students assigned to each team will be designing and utilizing data bases for research projects and record keeping. Each multidisciplinary team will develop a short term research project, based on data that is readily available through current patient records, design a data base(s), collect and manipulate the data, and produce a paper on the topic area. Students will be afforded the opportunity to interact with other departments at the Medical Center, accessing their data bases as needed.

There is precedence in the literature for a variety of research uses of computerized data systems from inpatient automated discharge summaries [10] to AIDS research.[11] A complex medical vocabulary has been designed by Rada et al. [12] known as Medical Informatics and enhances the realm of biomedical research utilizing a computer based data system. Child Development Center research projects will utilize this type of available program to enrich research and teaching potentials.

The key to making computers and information technology a viable tool for professionals is to make it a natural part of routine. Greenberg and Woods [13] advocate the need to make hardware and software readily accessible to students and professionals and expect them to utilize the technology themselves. This implies that each individual will become familiar with various programs and perform data entry, manipulation, and analysis on a routine basis. Hands on teaching and practice are therefore considered vital with an expectation for ongoing utilization. Friedman and Martin [14] suggest that physicians should be responsible for hospital and research data bases and data analysis to ensure that their needs for inpatient care, record accessibility and research data are met. The implication is that there is more to computerized systems than data entry clerks and programmers. Professionals need to understand the technology to utilize it adequately and appropriately.

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Community Networking

The most difficult step for any community and its myriad of service delivery agencies is communication and cooperation. The professionals working with the Child Development Center have taken the leadership role for Northeast California and are sponsoring an Interagency Collaborative Council.

Four counties and some thirty agencies are working together to enhance and expedite referrals, information exchange, and a professional understanding and respect for each other's program.

Child Development Center staff remain in pivotal leadership positions on this council. The long range goals of this council are to develop and implement a computer network based information system for referral and general demographic patient/client data. The stumbling blocks are current data accessibility, patient/client confidentiality, and valid release of information by the patient/client. As discussed earlier, there is a need for medical professionals to be aware of what the community is doing with the technology and to utilize their personal skills to enhance service delivery to their patients or clients. The Child Development Center program will offer experience for students in a community based forum and an opportunity to participate in a leadership role.

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Discussion

Information technology with its numerous applications is here to stay. The questions for the future are simple. What are we (as professionals in the medical and human services professions) going to do with this technology? How will we apply it? How will we manipulate and utilize this technology? How will we make it our own? The questions are simple — the answers are not.

The "users" and "non-users" are finding the gap between them widening each year. The difference between data entry skills and user skills is becoming more apparent. Learning to use this technology and becoming comfortable with it is no longer an option, but a necessity. Professionals who do not keep up, and who do not maintain their skills, will find themselves at a disadvantage, and students expect and demand that the "computerthread" be available to them on an ever increasing basis.

The field of medicine is a very dynamic profession where the opportunities to utilize state-of-the-art technology are available on a daily basis. A teaching institution has both the capacity and responsibility to keep its students on the cutting edge of new achievements and new applications of existing technology.

The Child Development Program is a demonstration of that responsibility. Our students will have both exposure to and experience with computers and information technology and its applications to the medical field. The expectation is that students, and the professionals who train them, will see the potentials of the technology, be aware of the ethical con-

cerns, and apply their skills to offer the best results and services to our consumers.§

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