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An Extension Note on:

*THE DEVELOPMENT OF A MICROCOMPUTER-ACCESSED DATA BASE:
NORTH CAROLINA HOUSING OPTIONS INVENTORY*

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ABSTRACT

This paper describes the development of an information package and dispersal strategy in the housing field--the Housing Options Inventory. The package is a microcomputer-accessed data base of housing resource persons in North Carolina developed by researchers for dissemination by extension personnel.

PURPOSE

This paper describes the process in which a model information package and dissemination strategy was developed. The major focus is on the research and development of the information package, rather than dissemination or extension strategy. The purpose is to describe the development of the Housing Options Inventory (HOI).

Information and services related to the housing needs of individuals and families in North Carolina are available, but there is no centralized data base or referral system to facilitate quick and effective location of information about resource persons. Existing knowledge networks are fragmented by area of expertise and by professional and organizational affiliation. Locating resource people whose expertise matches individual needs can be a cumbersome, frustrating process.

As a result of the explosion of information and the growing need for useful knowledge, a new field emerged in the 1960s; the science of information utilization. In a review of the literature on the dispersal and utilization of scientific knowledge, Havelock (1969) provides a framework for understanding the process: "Dissemination and utilization (D&U) is viewed as a transfer of messages by various media between resource systems and users" (p. iv).

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In an era when information is a valued resource, it is not enough merely to generate information and to assume it will find its way to those who need it. Attention must also be given to the process by which information is disseminated and used. Havelock (1969) identifies the Cooperative Extension Service (CES) as "The oldest, most elaborate, and most ambitious such effort... to build a complete formal system for D&U..." (p. 3-33). The Land Grant tradition has made major contributions to progress in rural America by emphasizing the research/extension partnership. By using the relationship between research and extension, CES has introduced many innovations significantly improving the quality of life.

SOCIAL AND TECHNOLOGICAL CHANGES

Changing social and technological conditions, along with leaner budgets, call for further innovations. It is especially important to find cost-effective techniques for developing and transmitting information that serves individual and family needs.

Extension's rural orientation and traditional transmission methods have been a strength in the past, but both its audiences and methods are changing. Historically, North Carolina has been rural. Today much of the state is still rural. While the state is experiencing Sun Belt growth and ranks tenth in population in the U.S., the population is about equally urban and rural. Almost half of the state's population increase of 750,000 during 1970-1980 was due to net migration. During the same time period, the number of SMSAs in the state increased from eight to eleven. The state's rural population ranks second in size in the nation (North Carolina State Data Center, 1982; North Carolina Population Note, 1981). These population changes emphasize the need for effective dissemination methods. This may be particularly important in the area of housing as large numbers of people move into the state.

The introduction of microcomputers into county extension offices permits agents not only to answer questions and teach skills, as they have done in the past, but also to link their urban and rural clients with a variety of resource persons within and outside of extension. Microcomputers and other information technologies represent an important opportunity for disseminating a variety of research-based information to urban and rural residents through community service agencies. These technologies will also make possible networking among professionals in loosely connected, geographically spread fields such as housing.

DEVELOPMENT PROCESS

Four broad goals were established to guide the development of the Housing Options Inventory. It was determined that the inventory should: (1) reflect a comprehensive range of housing options and related professional activities, (2) strengthen the research/extension interface, (3) promote the use of microcomputers in information dissemination, and (4) facilitate networking among professionals. These four goals presented a variety of problems and opportunities that were addressed through the process of developing the HOI.

The complex nature of housing led to the establishment of the first goal - a comprehensive view of housing options and professional activities. Housing encompasses the development, production, distribution, service, maintenance and consumption of a "bundle" of attributes including the physical unit, the neighborhood environment, types and quality of public services, location and investment (U.S. Department of HUD, 1979).

The development of keywords to describe the range of housing options and associated professional activities was one of the most critical and demanding aspects of the project. Keyword taxonomies had to be logical and comprehensible to a wide variety of professionals in the field of housing as well as to the general public. Although several potential sources of keywords for housing options and professional activities were identified (U.S. Department of HUD, 1980; Murtha, 1982), each dealt with only a segment of housing issues and dealt with them at a level of detail that was too complex to be handled by available microcomputer technology. It was, therefore, necessary to develop an original taxonomy to describe the range of professional efforts across the state and the range of the general public's housing information needs. To achieve clarity and consistency, each of the keywords was briefly defined in a glossary included in the questionnaire mailed to the resource professionals. The same definitions are a part of the HOI program and can be accessed by users.

The second goal was to strengthen the research/extension interface. This goal is important for several reasons. Every state has a land grant system with research and extension components. The mission of these components is to cooperatively produce and disperse information that meets users' needs. Carrying out this mission in North Carolina requires a special coordinated effort because these two administrative units are located on different campuses. The physical separation may contribute to fragmentation in the process of effectively utilizing information.

The third goal, promoting the use of microcomputers in information dissemination, was a response to research/extension mandates. A major thrust for extension in the future is to "enhance the speed and effectiveness of its delivery system designed to connect the products of research centers with the problems of people" (Leagans, 1979 p.48.).

The North Carolina Extension Service is phasing microcomputers into county extension offices throughout the state and will continue to do so until all county offices are equipped with a microcomputer. Home economics researchers talked with extension microcomputing personnel about developing the HOI. Other home economics microcomputer "software" programs had primarily involved short, self-contained computational routines. Using available microcomputer technology in a different way, for data base management, was deemed an appropriate model for research/extension information dissemination.

The final goal was the facilitation of information exchange among professionals throughout the state. Although service agencies, such as Extension, may be able to meet the needs of long-term residents through traditional dissemination methods, they may not be able to

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meet the future needs of a growing, changing population.

Evaluation has been planned as part of the research design and will provide information and feedback to researchers and Extension personnel regarding the use of microcomputer technology in disseminating research information.

THE HOUSING OPTIONS INVENTORY

The Housing Options Inventory (1984) is a data base program containing professionals' descriptions of their involvement in housing options. The information in the data base was obtained through a standardized mail survey of professionals in the state engaged in activities related to housing. The data base is accessed with a Radio Shack TRS80 Model 12 computer (64K capacity) and a key word-driven BASIC data base management program developed specifically for this project.

Identifying housing professionals

Persons who make up the population of housing professionals in North Carolina are an aggregate of several professional populations separated by differences in expertise, professional skills and activities, and organizational affiliations. The segmentation of professionals reflects the fragmented manner in which housing issues are dealt with in the public and private sectors.

The first step in identifying the population of housing professionals was to discover what occupational groups (e.g., architects, gerontologists, social workers, engineers), government agencies (e.g., Department of Natural and Economic Resources, Department of Human Resources), elected/appointed officials (e.g., building inspectors, planning directors, town managers), and non-profit organizations (e.g., local preservation groups, voluntary action councils) provide the services described by the housing options and professional activities taxonomies. The next step was to locate and obtain lists of each of these sub-populations. A total of forty sources, including lists such as the state government telephone directory, directories of municipal and county officials, and county Farmer's Home Administration and Extension Service personnel were obtained. Names, titles, addresses and telephone numbers for each person identified through these lists were entered into the data base management program that permitted the identification of duplicate entries, generation of address labels for the survey and followup mailings, and recording of returned questionnaires. Excluding duplicate entries, a total of 2841 persons were identified. Each had a job title and/or organizational affiliation suggesting involvement with housing. An additional fifty persons were identified and included in the survey as a result of recommendations from the initial respondents.

The survey instrument

The instrument used to collect professionals' descriptions of their involvement in housing contained two groups of questions. Respondents' answers to questions concerning their involvement in

housing became the data base for the Housing Options Inventory. The second group of questions included demographic information about educational background, age, sex, and occupational status. The data will be merged and statistically analyzed to study the nature and scope of housing options activity by professionals in North Carolina. During the development of the survey instrument, a panel of ten experts composed of professionals in various areas related to housing reviewed the questionnaire and the keyword taxonomies. Changes were made in the questionnaire based upon feedback from the experts.

A total of 840 usable questionnaires (of 2891 mailed) were returned. Approximately 217 surveys were returned indicating that the addressee was not involved in housing. Only one reminder to return the questionnaire was sent. The potential for future upgrading and expansion of the data base after the development and implementation of the model weighed heavily in this decision. Although a comprehensive and complete data base is the ultimate goal, the surveys returned were informative and substantially represented the ongoing work of housing professionals in the state. Technological concerns with data management and storage were also important considerations. An attempt was made to achieve a workable balance between the quantity of data in the HOI and the development and implementation of the HOI as a model. Another reason for sending only one reminder was the advantage of including professionals in the inventory who would be responsive to requests from users. It was assumed that those who do not respond to the request for information are also less likely to respond to subsequent requests for information from eventual users.

Role of keywords

For effective search and retrieval, a framework was needed to code information on housing professionals and their activities. Library reference rooms contain numerous abstracts and indices that can be searched manually or by computer. The general procedure is to search for keywords relevant to a topic of interest. Citations are then obtained that contain one or more of the selected keywords in the title, abstract, or an added set of keyword descriptors. In effect, the keywords permit selective searching of the data base.

The bibliographic model of keywords was used in conceptualizing the Housing Options Inventory program. However, unlike sophisticated bibliographic systems, the limited capabilities of hardware and software did not permit the searching of text for keywords. The keywords had to be isolated in a list and there were technical limitations on how many different keywords could be effectively accounted for, stored, and manipulated during a search. The solution was to create a standardized list of keywords for each group of sort variables: types of housing options, professional activities related to them, target audiences for programs and services, and geographic areas served. The keywords were used as responses in the survey to professionals and as search options to access the data base.

Search variables

The data base is comprised of, and can be searched by, four variables: types of "housing options," "professional activities" related to them, "target audiences" for programs and services, and "geographical areas" served (see Tables 1 thru 4). Housing options are defined as the range of choices available to individuals and communities that affect the quality, cost, and availability of housing, and the impact of development on natural and nonrenewable resources. Professional activities are defined as the range of development, human service, and public affairs activities that influence the supply of and demand for housing options. Target audiences are described by socioeconomic, demographic, physical, mental, or occupational characteristics. Geographic areas served include North Carolina's 100 counties plus three other codes: the Cherokee Indian Reservation, statewide services through a centralized office and statewide services through decentralized offices.

The standardized list of keywords, developed for each group of search variables, was used as a response set in the survey of professionals. They are currently being used as search options in accessing the data base. Using the HOI, it is possible to identify professionals who work throughout the state, or in any of North Carolina's 100 counties, by any of 38 "housing options," 51 "professional activities," and 20 "target audiences." Figure 1 is an example of the HOI output and includes a search summary and one record produced through the search.

CONCLUSION

New technology is opening up opportunities for developing and disseminating information. The HOI is an initial effort to use microcomputers to develop and disperse information on professional resources for a variety of housing options within a state. The data and dissemination program, developed within a home economics setting, is timely for any field in which information is fragmented and difficult to locate. The HOI is a microcomputer data base that can be updated, evaluated and expanded over time. It is particularly relevant to North Carolina, where there is need for housing information among a growing, but dispersed population. The development of similar programs, with the potential for cost-effective dissemination of needed information, is a possibility worth considering for other resource areas and in other states.

Table 1. Keyword Categories/Housing Options

ENERGY CONSERVATION	USER RESPONSIVE ENVIRONMENTS
Passive Solar	For Elderly
Active Solar	For Physically Disabled
Solar Greenhouses	For Developmentally Disabled
Earth Sheltered	For Emotionally Disturbed
Stoves	For Changing Households
Modified Heat Pumps	For Victims
Weatherizing	
Energy Audits	
EXISTING STRUCTURES	NATURAL RESOURCES
Retrofit	Water Resources
Remodeling/Renovation	Land Resources
Rehabilitation	Waste Management
Adaptive Use	Renewable Resources
Historic Preservation	Appropriate Technology
CONSTRUCTION	HOUSING COSTS
Methods	Alternative Mortgage Instruments
Materials	Labor Costs
Prefabrication	Construction Costs
Interior Finishes	Operating Costs
POLITICAL ISSUES	
Undeveloped Land	
Development Process	
Environmental Protection	
Building Quality Controls	
Property Rights	
Ownership	

Table 2. Keyword Categories/Professional Activities

EDUCATIONAL/INFORMATION DISSEMINATION	COMMUNITY SERVICE
Coursework	Transportation
Workshops/Training Sessions	Meal Preparation
Networking	Weatherization
Clearinghouse	Fuel Assistance
Printed Materials	Legal Issues
Toll Free Numbers	Emergency/Temporary
Mass Media	Housing
	Consumer Assistance
	Homemaker Services
PROMOTIONAL	DEVELOPMENT
Home Tours	Planning
Consumer Acceptance	Design
Industry Acceptance	Approved/Standardized Plans
Demonstration	Product/Material Selection
Advocacy	Installation/Construction
Competitions/Grants	Financing
Honors/Awards	Eligibility Requirements

Industry Leadership	Tax Incentives
Speakers Bureau	
RESEARCH	REGULATORY
New Product/System Research and Development	Public Policy Development
Monitoring	Building Codes
Test Units	Housing Codes
Consumer/User Evaluation	Zoning Regulations
Technology Transfer	Growth Controls
Surveys	Environmental Controls
Requirements Research	Settlement and Financing
Public Policy	Regulations
Public Opinion	Permits and Procedures
Data Base Development	Compliance

Table 3. Keywords Categories/Target Audiences

Renters	Rural Residents
Home Owners	Urban Residents
Prospective Home Buyers	Government Officials
Displaced Persons	Professional Groups
Migrant Seasonal Workers	Lenders
Elderly	Developers
Handicapped/Disabled	Builders
Low- and Moderate-Income Households	Manufacturers
Ethnic Minorities	Civic and Service Groups
Veteran	General Public

Table 4. Keyword Categories/Geographical Areas

Alamance
Alexander
Anson	Wilkes
Ashe	Wilson
Avery	Yadkin
Beaufort	Yancey
Bertie	Cherokee Reservation
.....	Statewide Services through
.....	Centralized Offices
.....	Statewide Services through
.....	Decentralized Offices

Housing Options in North Carolina

Summary of keywords used in search: Fri., May 18, 1984

Housing Options: (195)
Development Process

Professional Services: (79)
Technology Transfer
Public Policy
Data Base Development

Groups Served: (56)
General Public

Geographic Areas Served: (6)
Statewide (cnt1)

MICHAEL A STEGMAN

Record: 44

UNC-CHAPEL HILL

CHAPEL HILL, NC 27514

(____)____ - ____

Housing Options
Undeveloped Land
Development Process
Environ Protection
Bldg Quality Control
Property Rights
Ownership

Professional Services:
Coursework
Workshops/Training
Other (209)
Monitoring
Technology Transfer
Surveys
Public Policy
Data Base Development

Groups Served:
Low & Mod. Income Households
General Public

Geographic Area Served:
Statewide (cnt1)

Remarks:

209=SERVE ON STUDY COMMISSION, TASK FORCES.

Figure 1. HOI Output: Search Summary and Record

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