Current Status and Future Potential for Evaluating the Design
and Use of Computer-Based Career Information Delivery Systems
in the United States: Technical Report Number 17

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Career information delivery systems[1] (CIDS) are an increasingly
common resource for the delivery of information to individuals
involved in making career and educational choices. This paper is
intended to stimulate further discussion on improving CIDS evaluation,
ultimately leading to further refinement of ACSCI/NOICC evaluation
guidelines. This paper is also intended to support the current effort
to evaluate CIDS use in employment services. The term evaluation, as
used in this paper, includes both an objective description of current
CIDS use and judgements about the appropriateness of CIDS use in
relation to client needs. The paper begins by reviewing current
efforts to evaluate CIDS, and continues with limitations of current
CIDS evaluation efforts, recommendations for improved CIDS evaluation,
and concludes with potential common survey data elements for CIDS
evaluation.

Current Efforts to Evaluate CIDS

A variety of efforts are currently used to evaluate the design
and use of CIDS. By better understanding the current design and use
of CIDS, improvements can be made in future systems. Effective CIDS-
enhanced service delivery requires both that the system is well
designed by the developer and well used by the individual seeking
services.

Efforts to Evaluate the Design of CIDS

Standards 5.1, 5.2, 5.3, and 5.4 of the ACSCI Standards for
Computer-Based Career Information Systems require ongoing CIDS
evaluation, research, and development.[2] Evaluating the design of CIDS
typically involves:

1) Describing information sources;

2) Describing system features; or

3) Investigating the validity of the concepts used in various CIDS
   features (such as the pattern of interests or values used in
   various occupational search methods).

The following sources for evaluating the design of CIDS currently
exist:

1) The annual data collection for the ACSCI/NOICC data base;[3]

2) State-based evaluations related to CIDS selection;[4]

3) CIDS feature-cost analyses;[5] and

4) Studies conducted by CIDS developers (most of these studies are
   conducted in relation to the validation of new CIDS or
   substantially revised versions of existing CIDS).[6]

Efforts to Evaluate the Use of CIDS

Standards 7.1, 7.2, and 7.3 of the ACSCI Guidelines for the Use of Computer-Based Career Information Systems require ongoing evaluation of CIDS use.[7] Evaluating the use of CIDS typically involves:

1) Describing the current status of CIDS use;

2) Answering specific questions about the use of CIDS by clients within various organizations;

3) The implementation of CIDS; and

4) The management, governance, and financing of CIDS.

The following sources for evaluating the use of CIDS currently exist:

1) The annual data collection for the ACSCI/NOICC data base;[8]

2) Ongoing studies conducted by CIDS developers;[9]

3) Ongoing studies conducted by CIDS operators;[10]

4) Ongoing studies conducted by staff at various CIDS sites (schools, colleges, employment services, vocational-technical schools, libraries, rehabilitation services, correctional institutions, and military bases);[11]

5) Ongoing studies conducted by college and university-based faculty members who have an interest in the delivery of career services;[12]

6) One-time studies conducted by independent researchers that is sponsored by the federal government to investigate the use of CIDS on a national basis;[13] and

7) One-time doctoral dissertations completed by students who have an interest in the delivery of career services;[14]

Limitations of Current CIDS Evaluation Efforts

Knowledge about the design and use of CIDS has increased over the past 30 years. However, current CIDS evaluation efforts have the following limitations:

1) In proportion to the millions of individuals who use CIDS annually,[15] relatively little evaluation and research is conducted;[16]

2) The amount of evaluation and research varies considerably among CIDS, with some systems having substantial numbers of studies on a regular basis, while other systems have few studies that are conducted sporadically;

3) The amount of evaluation and research also varies considerably among CIDS sites, with more evaluation and research conducted in high school and college settings than in employment service, vocational-technical school, library, rehabilitation, correctional, and military settings;

4) Although efforts have been made by staff at ACSCI and the Center for the Study of Technology in Counseling and Career Development to identify CIDS evaluation and research studies, the substantial gaps existing in the literature make it difficult for individuals to identify (much less locate) appropriate studies;

5) Existing evaluation and research studies vary considerably in quality;[17]

6) Considerable variability exists in terms of questions asked among evaluation studies for various CIDS sites, making it difficult to compare CIDS use across sites, e.g., how CIDS use in a high school compares with CIDS use in an employment service. Variability also exists in the infrequency of evaluation, making it difficult to evaluate trends in CIDS use over time. While ACSCI standards provide a broad starting point for evaluation, more specific operational evaluation guidelines could improve both the consistency and frequency of evaluation.

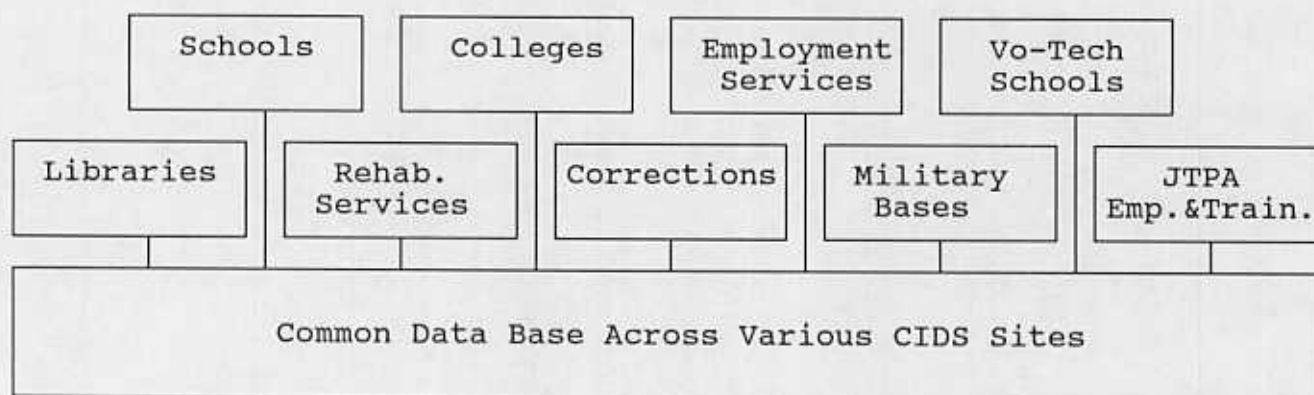## Recommendations for Improved CIDS Evaluation

In response to the limitations identified above, the following recommendations are offered to stimulate further discussion, problem solving, and planning related to the general improvement of CIDS evaluation:

1) The current efforts of ACSCI, NASOICC, NOICC, NCDA and others to encourage and support CIDS evaluation should continue. Additional opportunities and strategies for encouraging and supporting CIDS evaluation should be explored. ACSCI recommendations for short-term and long-term CIDS evaluation projects provide a useful starting point for discussing evaluation priorities.[18]

2) Opportunities and strategies should be explored for encouraging CIDS with minimal past evaluation efforts to increase their evaluation agenda. Such encouragement might include small matching grants for evaluation studies and/or technical assistance from ACSCI via CIDS developers/operators who have considerable evaluation experience.

3) Establish a strategic plan within ACSCI and NOICC for establishing funding priorities for evaluation studies in various types of CIDS sites, e.g., school, college, employment service, vocational-technical school, library, rehabilitation, correctional, and military settings. Priorities might be established on the basis of the total number of CIDS sites, legislative priorities, the availability of matching funds, etc.

4) Establish a plan for coordinating the development and dissemination of CIDS evaluation and research bibliographies by ACSCI and the Center for the Study of Technology in Counseling and Career Development. A bibliography is needed for each of the systems represented in the CIDS feature-cost analysis conducted at Florida State University.[19] This would make it easier for NOICC staff, CIDS developers, CIDS operators, and CIDS site staff, as well as faculty, student, and independent researchers, to identify the existence and location of CIDS design information and previous evaluations. By understanding more about CIDS design and previous evaluations, evaluators are more likely to improve the quality of evaluation designs and to reduce the likelihood of wasting time and financial resources on poorly planned and executed evaluations.

5) ACSCI, NOICC, NCDA and other interested organizations need to explore further opportunities for encouraging improved quality in CIDS evaluation efforts, based on our understanding of the limitations of previous evaluations and research.

6) ACSCI and NOICC need to establish guidelines for common survey data elements (questions that are asked) among evaluation studies for various CIDS sites, thus making it possible to compare CIDS use across sites in a valid and reliable manner. Potential common survey data elements for CIDS evaluation are presented in the following section of this report. Also, a commitment to regular intervals for evaluation will make it possible to evaluate trends in CIDS use over time.

Common Survey Data Elements for Evaluation of CIDS Use

In any CIDS use evaluation conducted at a specific type of site, some survey data elements (or questions) can be unique to the nature of the site while other survey data elements (or questions) can be common across sites. For example, specific sites may need to identify CIDS use by unique categories of users, while all sites might find it useful to identify users on the basis of general demographic characteristics, such as gender and ethnic status, to ensure that goals are met for serving diverse populations of users. The figure below shows how site-specific evaluation data can build upon common survey data elements across various CIDS sites.

Schools	Colleges	Employment Services	Vo-Tech Schools

Libraries	Rehab. Services	Corrections	Military Bases	JTPA Emp.&Train.

Common Data Base Across Various CIDS Sites

This blending of common and unique survey data elements can be accomplished by constructing CIDS evaluation surveys in two parts. Part one could contain the common survey data elements (questions) that would be identical for all surveys, while part two could contain unique survey data elements (questions) that would be used for only one type of CIDS site. Having a common data base will allow comparisons among different CIDS sites. This type of data could be used by individual CIDS sites as well as state and national CIDS policy makers to plan for future CIDS design and use.

Potential Common Survey Data Elements

1) **Organizational Characteristics** (What is the nature of organizations currently using CIDS?)
   Type of organization (elementary school, junior/middle school, high school, college, employment service, vocational-technical school, library, rehabilitation service, correctional institution, and military base)
   Total number of staff (professional staff and support staff)

2) **User Characteristics** (What is the nature of CIDS users?)
   User demographics (gender, ethnicity, disability status, age, etc.)
   User needs (specific categories of user needs may vary among different types of CIDS sites)

3) **CIDS Use** (How are CIDS being used in practice?)
   Name of CIDS used (Choose from a list of CIDS options or write in the name of the software being used - This item might also include the CIDS version used)
   Length of time the CIDS has been used within the organization
   Total number of clients served by the organization over the past year vs. the total number of clients using the CIDS over the past year
   Amount of client use of various system delivery media (micro, networked micro, mainframe)
   Total number of CIDS access points (including central and remote locations) and the number of computers at each access point
   Average number of client sessions using the CIDS
   Average length of client appointments using the CIDS
   Average total time clients spend using the CIDS
   Staff perceptions of clients use of CIDS features/components (use actual data if available)
   Average number of hours per day the CIDS is available for client use
   Average number of days per week the CIDS is available for client use
   Nature of CIDS support materials used

4) **Integration with Other Resources** (How are CIDS used in conjunction with other information resources?)
   Availability of supplemental career information resources

5) Staff Activities to Assist Clients in Using the CIDS (What is the
    nature of support provided to clients using CIDS?)
    prescreening (ensuring CIDS use is appropriate given client needs
        and characteristics)
    recommending a strategy for CIDS use that relates to client needs
        and characteristics
    orientation to the operation of the computer
    providing an introduction to the functioning of various CIDS
        features
    answer client questions during CIDS use
    monitor client CIDS use during counseling sessions in between
        scheduled CIDS appointments
    follow-up of CIDS use by clients to determine if initial needs
        have been met
    providing recommendations for client use of subsequent services
        or information resources
    stand-alone use of CIDS without staff intervention
    percentage of users who make use of each of the above staff
        activities
    format for delivering each of the above staff activities
        (individual, small group, large group)
    type of staff members providing each of the above activities
        (including professionals, paraprofessionals, and clerical
        support staff)

6) System Selection, Integration, and Management (How are CIDS
    selected, integrated into ongoing services, and managed?)
    Process for selecting the CIDS currently in use
    Process for determining how the CIDS will be used as a component
        of service delivery
    Process for maintaining contact with the CIDS operator and/or
        CIDS developer
    Barriers to effective system use

7) Staff Training (How does CIDS staff training occur?)
    Person responsible for planning staff training
    Person responsible for managing staff training
    Person responsible for conducting staff training
    Training process used
    Training resources used
    Nature of training for different types of staff

8) System Evaluation (How is CIDS effectiveness evaluated?)
    Person responsible for planning CIDS evaluation
    Person responsible for managing CIDS evaluation
    Person responsible for conducting CIDS evaluation
    Frequency of evaluation
    Types of evaluation methods used
    Nature of evaluation variables, e.g. use of CIDS features, client
        satisfaction, learning outcomes.
    Impact of CIDS use on evaluation variables, e.g. positive,
        negative, and no impact

9) System Financing (How are CIDS financed within the organization?)
    Funding sources supporting CIDS use

It may be difficult to determine which of the above survey data elements should be included as a basic component of all CIDS evaluation questionnaires. First, a tension typically exists between evaluators who want to be comprehensive in their coverage of evaluation questions, and staff members who are generally very busy and who respond more favorably to brief evaluation questionnaires. Second, it is often difficult to predict which evaluation questions will have the most strategic importance in relation to legislation and funding. Given these difficulties, it would be appropriate to begin with an initial set of common survey data elements, evaluate the usefulness of the data, and then revise the data elements as necessary. These survey data elements also need to be evaluated in terms of their congruence with ACSCI standards and the ACSCI/NOICC database. It will also be important to determine how often evaluations of CIDS sites need to occur and how missing data will be dealt with? Finally, it would be useful to establish a plan for identifying "best practices" in CIDS use. Ultimately, evaluation efforts should provide a more complete understanding of both the nature of CIDS design and use, and the eventual impact of CIDS on individuals, service delivery organizations, and society.

Endnotes

[1] For the purposes of this report, the term "CIDS" refers to computer-based career information delivery systems, and includes computer-assisted career guidance (CACG) systems.

[2] Association of Computer-Based Systems for Career Information. (1992). Handbook of standards for the operation of computer-based career information systems. Alexandria, VA: Author, ACSCI Administrative Office, National Career Development Association.

[3] CIDS design data from the ACSCI/NOICC data base is available in electronic form.

[4] Bloch, D. P., & Kinnison, J. F. (1989). A method for rating computer-based career information delivery systems. Measurement and Evaluation in Counseling and Development, 21, 177-187.

[5] Sampson, J. P., Jr., Reardon, R. C., Wilde, C. K., Norris, D. S., Peterson, G. W., Strausberger, S. J., Garis, J. W., Lenz, J. G., and Saunders, D. E. (1993). A Differential Feature-Cost Analysis of Fifteen Computer-Assisted Career Guidance Systems: Technical Report Number 10 (4th Ed.). Tallahassee, FL: Florida State University, Center for the Study of Technology in Counseling and Career Development.

[6] Examples of this type of evaluation and/or research may be found in the evaluation and research report sections of selected CIDS/computer-assisted career guidance (CACG) bibliographies from the Center for the Study of Technology in Counseling and Career Development. System-specific bibliographies are currently available for Choices systems, DISCOVER systems, and SIGI PLUS.

[7] Caulum, D., & Lambert, R. (Eds.). (1985). Guidelines for the use of computer-based career information and guidance systems. Eugene, OR: Association of Computer-Based Systems for Career Information, ACSCI Clearinghouse, University of Oregon.

[8] CIDS use data from the ACSCI/NOICC data base is available in electronic form and via summaries in the following documents:

National Occupational Information Coordinating Committee. (1992). Status of the NOICC/SOICC network (NOICC Administrative Report No. 18). Washington, D.C.: Author.

Association of Computer-Based Systems for Career Information: (1993). 1993 directory of state-based career information delivery systems. Alexandria, VA: ACSCI Administrative Office, National Career Development Association.

[9] See endnote 6 above.

[10] Evaluation studies of this type are typically available from individual CIDS operators.

[11] See endnote 6 above.

[12] Sampson, J. P., Jr., Shahnasarian, M., & Reardon, R. C. (1987). Computer assisted career guidance: A national perspective on the use of DISCOVER and SIGI. Journal of Counseling and Development, 65, 416-419.

Also see endnote 6 above.

[13] Hopkins, V., Kinnison, J., Morgenthau, E., & Ollis, H. (1992). Career information delivery systems: A summary status report (NOICC Occasional paper No. 4). Washington, D.C.: National Occupational Information Coordinating Committee.

Sampson, J. P., Jr., & Norris, D. S. (1993). The financial status, organizational structure, and staffing of career information delivery systems in the United States (technical report No. 16). Tallahassee, FL: Florida State University, Center for the Study of Technology in Counseling and Career Development, Tallahassee.

[14] See endnote 6 above.

[15] Association of Computer-Based Systems for Career Information: (1993). 1993 directory of state-based career information delivery systems. Alexandria, VA: ACSCI Administrative Office, National Career Development Association.

[16] Rayman, J. R. (1990). Computers and career counseling. In W. B. Walsh & S. H. Osipow (Eds.), Career counseling: Contemporary topics in vocational psychology (pp. 225-262). Hillsdale, NJ: Lawrence Erlbaum Associates.

[17] Specific criticisms of the quality of CIDS evaluation and research are provided by:

Cairo, P. C. (1983). Evaluating the effects of computer-assisted counseling systems: A selective review. The Counseling Psychologist, 11, 55-59.

Clyde, J. S. (1979). Computerized career information and guidance systems. Columbus, OH: The Ohio State University, ERIC Clearinghouse on Adult, Career, and Vocational Education. (ERIC Document Reproduction Service No. ED 179 764).

Katz, M. R., & Shatkin, L. (1987). The need for research. Career Planning and Adult Development Journal, 3(2), 63-70.

Parish, P. A., Rosenberg, H., & Wilkinson, L. (1979). Career information resources, applications, and research 1950-1979. Boulder, CO: University of Colorado.

Rayman, J. R. (1990). Computers and career counseling. In W. B. Walsh & S. H. Osipow (Eds.), Career counseling: Contemporary topics in vocational psychology (pp. 225-262). Hillsdale, NJ: Lawrence Erlbaum Associates.

Sampson, J. P., Jr. (1984). Maximizing the effectiveness of computer applications in counseling and human development: The role of research and implementation strategies. Journal of Counseling and Development, 63, 187-191.

Snipes, J. K., & McDaniels, C. (1981). Theoretical foundations for career information delivery systems. Vocational Guidance Quarterly, 29, 307-314.

[18] Lambert, R. & Caulum, D. (1990). A call for research on the economic and social impacts of career planning and information delivery systems. Alexandria, VA: Author, ACSCI Administrative Office, National Career Development Association.

[19] Sampson, J. P., Jr., Reardon, R. C., Wilde, C. K., Norris, D. S., Peterson, G. W., Strausberger, S. J., Garis, J. W., Lenz, J. G., and Saunders, D. E. (1993). A Differential Feature-Cost Analysis of Fifteen Computer-Assisted Career Guidance Systems: Technical Report Number 10 (4th Ed.). Tallahassee, FL: Florida State University, Center for the Study of Technology in Counseling and Career Development.