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ABSTRACT

This review notes two major trends characterizing institutional research in community colleges today: (1) the communication of research results, and (2) the shift toward applied rather than theoretical research. A third trend noted is the desire by certain persons to create an institutional position of "Information Dean," who would provide needed information to decision makers. Several organizations established for exchanging information about community colleges are: the American Educational Research Association's Special Interest Group in Community Junior College Research, the Council of Community College Boards, the Community College Social Science Association, the California Educational Computing Consortium, the Audio-Tutorial Congress, and the Mountain States Community College Consortium. The changing emphasis in research from student characteristics-type tabulations to more pertinent decision-making topics is a result of increased concern for information needed "in" the community college rather than "on" it. The trend is toward research that results in usable models and that which analyzes existing procedures to make them more effective and efficient. (AL)

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TRENDS AND DEVELOPMENTS IN INSTITUTIONAL RESEARCH

The American Educational Research Association, at its national meeting in Chicago, April 3-7, 1972, will set a major milestone for community college institutional research. At this conference, the Special Interest Group for community college research will have four paper sessions, a business meeting, and an informal session sponsored by the ERIC Clearinghouse for Junior Colleges. The event will mark the culmination of the efforts of many who want to create a national platform for community college institutional research.

The meeting is significant, for it indicates several trends and developments in institutional research, some of which are examined in this special AERA issue of the *Junior College Research Review*. The developments are less a matter of research technique than of recognizing the need for research findings to aid in decision making.

Major Trends

Two major trends characterize institutional research in the community college today: one is communication of research results to practitioners and between those involved in the research; two is greater emphasis on what many call "applied" research, as opposed to "theoretical." The two trends are leading to the creation of *applicable* rather than *abstract* models.

Some feel a third and influential trend in institutional research may alter the image and functions of the institutional researcher in the community college. Several knowledgeable junior college administrators have spoken of creating an "Office of Information," directed by an "Information Dean," that would design a system for collecting institutional data to be used by college decision makers. It would establish a common data base for all and make the collection of data an ongoing process. It would be the job of the Information Dean to interpret, analyze, and report his findings regularly to the Board of Trustees, administration, faculty, and the institutional community at large.

The Clearinghouse purposes are quite in tune with the developments in institutional research. It varies its operations in keeping with the trends described in this report. Many workers may be familiar with the functions of the Clearing-

house, but to refresh their memories and inform new readers, some of its basic services are listed below.

1. Document searches on any topic dealing with community college development can be made on request. They cover all documents in the collection (approximately 2,000). Abstracts on the subject are pulled from the files and copies sent to the requester along with any other relevant references and data on the subject. There is no charge for the service or the materials.

2. Because the Clearinghouse publishes research on the community college, it has been its practice to issue publications jointly with other organizations. Thus, its publication activities are as varied as the organizations with whom it cooperates.

3. With over 100,000 community college practitioners in the country, it cannot possibly maintain a stable mailing list. It has been the policy, therefore, to disseminate published materials only through its selective mailing lists of organizations formed to contribute to community college development, including the AERA/SIG, Council of Community College Boards, Community College Social Science Association, and subscribers to the *Junior College Research Review*.

4. A major activity of the Clearinghouse is supporting institutional research in the community colleges, whose research efforts have long been subordinated to and remote from the promotional and developmental activities of the institution. Before the community college became the major enterprise it is today, decision makers seemed indifferent to how the institution used its relatively limited resources. Moreover, when the enrollment was relatively small and the curriculum stable, most problems could be solved by traditional procedures.

Requests and inquiries received at the Clearinghouse clearly show that decision making no longer relies entirely on personal judgment or past methods. Unfortunately, while institutional research in the college has increased measurably over the past few years, few administrators have given a firm commitment to using its findings in decision making. Nevertheless, research studies are increasing in number and improving in quality.

Improvements in Communication Among Researchers

People at all levels of education, interested in community college research, have felt the need to establish communication links among themselves. Members of AERA have formed a Special Interest Group (SIG) for community junior college research. Vernon Hendrix (University of Minnesota) is the current national chairman and the Clearinghouse for Junior Colleges is the national secretariat.

The AERA/SIG is divided into several regional sections, led by community college researchers and university-based associates, enabling those who cannot attend the national meeting of the AERA to readily exchange information. Regional chairmen who served this past year were Michael Schafer, Henry Moughamian, Paul Elsner, Young Park, Henry Reitan, Ernest Beals, and Frances Kelly.

An *AERA/SIG Newsletter* is published and distributed to the membership by the Clearinghouse. The November 1971 issue listed over forty-five research projects undertaken by AERA/SIG members in the fall of 1971. Each researcher received abstracts of ERIC documents in his particular area of interest. Further opportunities to exchange information are planned at the April AERA meeting through formal presentations of papers and informal meetings sponsored by the Clearinghouse.

Other groups interested in research exchange information and publications through the Clearinghouse, using it as a reference source. Notable examples of dissemination are *The Danforth Foundation Directory of Self-Instructional Materials*, four issues of the Topical Paper series devoted to reading programs in the Community College, and the *Community College Social Science Quarterly*.

New Organizational Emphasis

Several new groups have been organized in the past few years, pointing up the need for a base from which those interested in research may exchange information and develop themselves in the unique level of community college education. Examples of these newly emerging groups are:

1. *Council of Community College Boards*. This council is a subdivision of the National School Boards Association, one of the largest educational groups in the country. The CCCB is interested in community college research from a layman's point of view. Its members want more information both for decision making and for keeping abreast of recent developments in all phases of the community college.

The special research needs of this organization include fiscal accountability, federal legislation, master plans for new colleges, instructional evaluation, and innovations. The Clearinghouse is cooperating in several ways: assistance with publications that include a handbook for new trustees; establishment of a model information system to identify specific sources of information; and, of course, maintaining the user services of the Clearinghouse.

2. *Community College Social Science Association*. This group emphasizes subject matter, but the members are also concerned with community college organization, instruction, curriculum development, and innovation. It was notably successful in convening its first national conference in 1971 and in launching a major publication effort, the *Community College Social Science Quarterly*, this past year.

3. *California Educational Computing Consortium*. The growing use of computers in all phases of education is fostered by the CECC. Based in California and only three years old, it has rapidly become the major source of

information on computer science, for both the community college and higher education in general. Research and studies of interest to the CECC include computer-assisted instruction, administrative uses in registration and student records, curriculum development in computer sciences, and articulation with secondary and four-year institutions.

4. *Audio-Tutorial Congress*. Attendants at the Third Annual Audio-Tutorial Conference at Purdue University last November, of whom over half were community college instructors, formed this congress to promote audio-tutorial instruction in their colleges. Their special interests are instructional objectives for college courses, self-instructional material, audio-tutorial software and hardware, and the development of "learning mastery" in teaching.

5. *Mountain States Community College Consortium*. Seventeen community colleges in the Rocky Mountain area formed a cooperative union to upgrade their institutions last year. Special areas designated for further study include developmental (remedial) programs, identification and selection of methods for evaluating faculty and administrative work or output, and improved instructional methodology and effectiveness.

These are examples of how community colleges are organizing bases in every segment of their operation to exchange information and identify common problems for which research offers possible solutions. Junior college educators are no longer isolated from the mainstream of the research being conducted in other fields.

Changed Emphasis in Community College Research

Examining the list of projects under way (as reported by AERA/SIG members) shows that research is shifting to such topics as career education from those that merely tabulate student characteristics. A review of the reports in the ERIC collection from the summer of 1969 to the present reveals that about half the listings in *Research in Education* were descriptive studies of students, but only seven of the forty-five responses from AERA/SIG members named current studies of this nature.

Similarly, studies on curriculum development and instruction have been radically reduced. About 40 per cent of the studies from 1969 to the present were on some aspect of curriculum development, but the survey of current research projects revealed only four of them. Researchers are concentrating on specific areas of curriculum rather than on development in general in an attempt to create models that can be immediately replicated.

Practitioners throughout the country are now interested in career education programs, indicating how important they are to the U.S. Commissioner of Education. Twenty-five per cent of the proposed studies were on this subject, and reading projects and a number of other curriculum studies were indirectly related to it. Also related are the community surveys to determine the current educational needs of different parts of the community. Special solutions are sought for rural, urban, senior citizens', and women's needs.

Community surveys on accountability are also being conducted to determine the relative importance of the educational programs to the community and to the institution itself. Other studies projected for this year on teacher preparation and in-service training (five were reported) all take note of accountability. Several deal with the effectiveness of certain teaching methods, particularly the new teacher preparation programs with a greater emphasis on student learning than

on traditional teaching styles.

A surprising number of studies are being done on community college administration, e.g., accountability and alternative structures of organization. Among other notable projects now under way is a special one on "middle management" in the community college, the level that has been known traditionally as the "department" or "divisional" chairman. Four recent regional conferences on divisional chairmen led to a Clearinghouse study on middle management that examines alternate models of organization, teacher evaluation, compensation, and the development of a handbook for division chairmen.

While educators have always been interested in educational organization, it is a relatively new idea for community college educators to undertake an analysis of their institutional structure. Until six months ago, few such studies were conducted, but recently a number have been started. This may indicate that administrative organization has become a major interest of both faculty and administration, an interest given impetus perhaps by learning and fiscal accountability studies. Furthermore, national implementation of the Program Planning Budget System (PPBS) (the state of California has made it mandatory in public schools) has triggered a number of studies on its use in the community college. Attempting to measure learning and to relate its effectiveness to finances is extremely difficult, but it is one of the new information needs of the community college. The relationship is being studied by the League for Innovation in the Community College. Related studies include projects on cost analysis and behavior objectives, student-faculty ratios, and space use.

Another study that is under way, by John Lombardi of the Clearinghouse staff, is on the financial crisis in the community colleges. It deals primarily with alternate models of junior college financing. Several models are being examined and will be suggested as possible solutions to funding problems.

These are examples of the prime subjects of community college research today. The Clearinghouse is working closely with a number of organizations to determine their current research needs and to assist them in developing alternate models for immediate implementation. The Clearinghouse, for instance, is currently helping the Council of Community College Boards develop an information system tailored to its special needs. It will concentrate on key decision-making areas and will attempt to identify sources of information (called "meta-information").

Emerging Trends

Discernible trends in the development of institutional research may have far-reaching effects on research in the community college. First, the research has become more than a topic of study within the framework of higher education or education in general. Examples of its "academic acceptance" are the interest shown in the AERA and the establishment of a Special Interest Group in community college research. However, institutional research must still become an integral part of community college operations. Much can be done by interested people in the American Association of Junior Colleges, state and regional community college groups, and other organizations. More emphasis must be placed on the word "institutional" in institutional research; research should be of the community college rather than *about* it. Making institutional research truly institutional can be readily accomplished. Leaders can redefine their purpose and functions so that a collected in their institutions become the standard

for all decision making — in contrast to data collected for a special project. Devising a system of data collection for all phases of the institutional operation would make the input both constant and uniform. This is similar to the suggestion for the creation of an information dean in place of the institutional researcher.

A second trend in institutional research is the emphasis on applied research. The increase in the number of research projects on real problems reported by AERA/SIG members (and the increased demands by practitioners for them) may presage a major change of goal for institutional research. It may well become "user-oriented" rather than "producer-oriented."

A third development in institutional research is the growing demand, expressed by both organizations and individual practitioners, for information rather than research studies *per se*, that is, information needed *in* the community college as contrasted to that *on* the community college. Both kinds of data may be used for decision making, but demand for the former has been increasing. Research that results in a usable model and research that analyzes existing procedures to make them more effective and efficient are sought today.

Finally, institutional research (and research in general) seems to have become more sensitive to the demands of the community and legislative agencies, as shown by the amount of research on career education and accountability. The interest in accountability may have positive effects on research, insofar as information on the institution is now a necessity, rather than a tired exercise. Consequently, the suggestion for an "Information Dean" is less far-fetched than it seems.

It is a welcome relief to see that institutional research is undergoing changes in approach, emphasis, and purpose. Fortunately, many doubtful practices have not yet become embedded in the operation of a community college, for, if this were the case, changes would be difficult or even impossible.

It was noted above that institutional research should be of the institution, rather than *about* it. Literature on this activity is generally only about the superficial occurrences in community colleges. As a departure from this cursory approach, the ERIC Clearinghouse has collected nine essays from practitioners who deal with the day-to-day problems of institutional research. Their insights into the operation of an office of institutional research have been published as Topical Paper No. 30, "The Practitioner Views Institutional Research." It will be released as a companion to this issue of the *Junior College Research Review*.

Being the first of its kind, this publication has considerable significance for community college research — it is written for practitioners by practitioners about their own work. Whatever might be said about how institutional research should be organized and operated, these papers tell how it is *actually* done amid all the restrictions and problems found in an institutional framework.

Areas in institutional research that require change need identification and critical examination. One may marvel, however, at the amount of work that is actually accomplished by the practitioners. The will and ability exist; the great lack is administrators with the foresight to use institutional research for their decision making.

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Abstracts of the ERIC (Education Resources Information Center) Documents can be found in *Research in Education (RIE)*. This publication of the Department of Health, Education and Welfare is available from the Government Printing Office, Washington, D.C. 20402 at \$1.75 for a single issue or \$21.00 for twelve issues yearly. The index to it is cumulated annually and semi-annually.

The ERIC Documents (ED's) listed in the bibliography may be purchased on microfiche (MF) or in hard copy (HC) from ERIC Document Reproduction Service, P.O. Drawer O, Bethesda, Md. 20014. MF prices are \$.65 per document, regardless of size; HC costs \$3.29 per units of 100 pages or less. Payment must accompany orders of \$10.00 or less and should include sales tax where applicable. No handling charge is required.

The *Current Index to Journals in Education (CIJE)* indexes articles from more than 500 current journals and periodicals. It is available from CCM Information Sciences, Inc., 866 Third Avenue, New York 10022 at \$3.50 per copy or \$39.00 for twelve issues annually.

The *Junior College Research Review (JCRR)* is compiled and

Subscribers to the *Junior College Research Review* will receive a copy of the new Topical Paper (No. 30), "The Practitioner Views Institutional Research," with a foreword by Paul Elsner. The contributors are Ben K. Gold, Richard W. Brightman, Ann Bromley, Fred A. Snyder, Harry Moughamian, James E. Cook, and Boris Blai, Jr.

edited at the ERIC Clearinghouse for Junior Colleges, Room 96. Powell Library, University of California, Los Angeles, California 90024.

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Besides processing documents for the ERIC system and issuing the *Junior College Research Review*, the Clearinghouse publishes two other series of its own. The Monographs are in-depth studies of interpretations of research on junior colleges. They are available from AAJC at \$2.00 each. The Topical Papers are either research models useful for general junior college testing or items of occasional interest to the field. A limited supply of Topical Papers still in print is available from the Clearinghouse. Back issues can be purchased through ERIC Document Reproduction Service. The Clearinghouse will be pleased to send a free list of titles and their availability.

Hazel Horn, Editor

All those interested in junior college institutional research are reminded that the Clearinghouse for Junior Colleges will sponsor an evening session during the AERA Convention in Chicago, April 3-7, 1972, to discuss research topics of greatest current interest.

JUNIOR COLLEGE RESEARCH REVIEW

American Association of Junior Colleges

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4.0 DESIGN FEATURES AND TECHNICAL SPECIFICATIONS

4.1 Data elements and record formats

The data elements selected for CLOSSS (Table 1) have two basic functions. Firstly, as descriptive cataloguing data, e.g. title, previous title, issuing body; secondly as bibliometric data, which although strictly of a bibliographic nature is considered more important as descriptive parametric information, e.g. beginning date, frequency in issues per year, country of publication, subject content. The variables in the bibliometric analysis consist of the second type of data. However, for file creation purposes there is no difference between the two types of data. The definition of data elements for CLOSSS owes much to the standards established by Loughborough PDS (Evans, Wall & MacKay, 1969) and the MASS proposal (Loughborough University of Technology and Birmingham Libraries Co-operative Mechanization Project, 1970).

Table 2 shows the relationship between CLOSSS and the serials systems considered by DISISS, in terms of record fields and format. Both MASS and a MASS minimal subset can accommodate all or a major selection of CLOSSS data elements in their record structure. This correspondence of data elements makes it possible for CLOSSS to use the MASS tag structure if conversion routines are developed; adopting the compatible tag structure provides the key to any future exchange of serials data between CLOSSS and files using MARC or MASS record formats. The acceptance of a standard record format and set of tags is of great importance to the current international effort on the control of serials data and the creation of machine readable files. In addition there must be flexibility to allow insertion of locally required data elements. Particularly important is the comparison in Table 2 of data elements for CLOSSS and ISDS. The overlap would enable CLOSSS to make initially a substantial contribution to an international file of serials data. Data elements required for DISISS studies of the secondary serial literature are shown; they form a subset of CLOSSS data elements. To accord with future international practice ISSN has been added to the set of data elements for CLOSSS, although it was not included on the data collection sheets.

4.2 Data collection for CLOSSS

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Specimens of data collection sheets are appended to this paper. The earlier version was used in April 1971 and subsequently modified to provide

TABLE 2

COMPARATIVE COVERAGE OF DATA ELEMENTS

CROSS (Collection sheet)	LUT/PDS	MASS MINIMAL SUBSET	ISDS (MARTIN & BARNES) (Levels 0-3)	FULL MASS	SECONDARY SERVICES DATA: REQUIREMENTS
(00) IDENTIFICATION NUMBER	X	X G/001	X D3	X G/001	X
(01) TITLE	X	X G/200 (General variable)	X D11/D14(?)	X G/200	X
(02) TITLE IN ENGLISH IF DIFFERENT FROM (1)	X				
(03) ALTERNATIVE TITLE		X G/246 (General variable)	X D13	X G/246	X
(04) PREVIOUS TITLE		X G/780 (General variable)	X D17	X G/247	X
(05) BEGINNING DATE	X	X G/008C	X D6	X G/008C	X
(06) ENDING DATE	X	X G/008D	X D7	X G/008D	X
(07) FREQUENCY ISSUES PER YEAR	X		X D8	X G/008F	X
(08) ISSUING BODY					
(09) TYPE OF ISSUING BODY	X	G/260(?) (General variable)	X D32	X G/260 (3a)	X
(10) PUBLISHER (NAME)	X	X G/260 (General variable)	X D24	X G/260 (3b)	X
(11) COUNTRY OF PUBLICATION	X	X G/008E	X D25	X G/008E	X
(12) TYPE OF SERIAL	X	X G/008I	X D33	X G/008I	X
(13) DESCRIPTION OF SERIAL	X	X G/008L		X G/008L	
(14) NATURE OF CONTENTS	X			X G/008M	
(15) ABSTRACTS WITH ARTICLES	X			Temporary additional field	
(16) LANGUAGE OF CONTENTS	X	X G/008U (G/041)	X D10	X G/008U	X
(17) SUBJECT CONTENT	X	Temporary additional field	X D26	Temporary additional field	X
(18) NUMBER OF ARTICLES	X			Temporary additional field	X
(19) SUBSCRIPTION PRICE	X			X G/350	X
(20) INDEXING SERVICES (COVERAGE)			X D28	X G/510	
(21) ISSN		G/001	X D3	X G/022	X

the version used from July 1971, which is now the standard data collection sheet for serials data. The data collection sheets went through extensive field trials at the Polytechnic of North London School of Librarianship. Research assistants and students at the Polytechnic have been responsible for the bulk of field data collection at Senate House Library, University of London; British Library of Political and Economic Science; National Lending Library for Science and Technology; and a variety of specialist subject libraries, mostly in the London area.

Bulk collection of data in the field is supplemented by the identification of serial titles in published bibliographies. Serial titles discovered in this way are sought in libraries (where possible) and information on them collected by examination of actual copy.

The main published bibliographic sources in use are listed below.¹ Each source contributes at least a small proportion of new titles. Collection policy has been to err on the side of exhaustivity and inclusiveness with regard to subject coverage and type of publication. The citation data should reveal a number of new and relevant titles to add to the file, particularly from non-conventional social science fields. This process of addition constitutes the bibliometric refinement of the serials file. At some stage certain titles might be removed from the file. Although data collection has drawn on the resources of many libraries, the overall rate of duplication on titles already collected is so far about 6 per cent.

¹ British union catalogue of periodicals (BUCOP) London, Butterworths, 1955-1958; Inventaire des périodiques étrangers et des publications en série étrangères reçus en France, Paris, Bibliothèque Nationale, 1969; Irregular serials and annuals: an international directory, New York, Bowker, 1967; National lending library for Science and Technology, Current serials received, London, HMSO, 1971 (an up-to-date printout was made available to DISISS); New periodical titles, London, Butterworths, 1964-; Ulrich's international periodicals directory, New York, Bowker, 1970; World list of social science periodicals, Paris, UNESCO, 1966.

In addition a file of specialist bibliographic sources of information on serials is maintained to supplement the general works mentioned above.

4.3 Editing, coding and data input

The Polytechnic of North London has been responsible for full editing of data. Published sources, staff expertise and further field collection have assisted in improving the quality and coverage of data. Although great use has been made of published sources initially to locate titles, their use in editing has been less. Each source has certain advantages and disadvantages for the purpose of collecting and editing serials data and this lends weight to our initial premise that no existing list of social science or other serials was directly suitable for DISISS bibliometric studies.

The data is to be punched on to paper tape and a master file created on magnetic tape or disk. Paper tape input is more suitable to the variable length data constituting the CLOSSS records. Some data elements are being replaced by codes on the data collection sheet at the final editing stage and punching will be done directly from edited sheets. It has been possible to dispense with a manual coding from data collection sheets to a computer coding form.

Coding and punching errors will be identified, either by computer during the data vetting or by visual proof reading when the proofs of the file print-out are examined.

4.4 Programs

Programs for the data vetting, descriptive statistical analysis of the file and setting up of matrices for the citation analysis will be developed on the project. Some use may be made of standard statistical packages. Later on, conversion programs for MASS or a similar internationally approved record structure could be developed.

4.5 DISISS data bases

As far as possible internal consistency will be sought between serials, citations, secondary services and modelling data bases. Attention is being given to the use of other files of data which could be useful for bibliometric analysis. These other files may or may not yet be compatible with internal DISISS files. Psychological Abstracts

tapes, the ISI Science Citation Index file, and the Bowker machine readable serials file are potentially useful.

If consistency was achieved through MASS compatible record formats, it would be possible to run bibliometric analyses on other data using DISISS programs. The type of products and exchange of information outlined in Chapter 5 of the ISDS proposal (Martin & Barnes, 1970) could be realised, e.g. periodic bibliometric review projects (para. 5.4.3). There are good reasons for this broader outlook - data collection can be reduced; other sources could be used to widen the sample for bibliometric studies; bibliometric techniques could be tested in other situations; and some return on program development effort could be expected.

There appears to be every advantage to be gained from creating compatible machine readable data files.

5.0 USES OF MACHINE READABLE DATA BASES WITH PARTICULAR REFERENCE TO CLOSSS

When CLOSSS becomes available in MASS or an internationally compatible format there are a number of areas where it would be desirable and feasible to take advantage of its compatible machine readable structure.

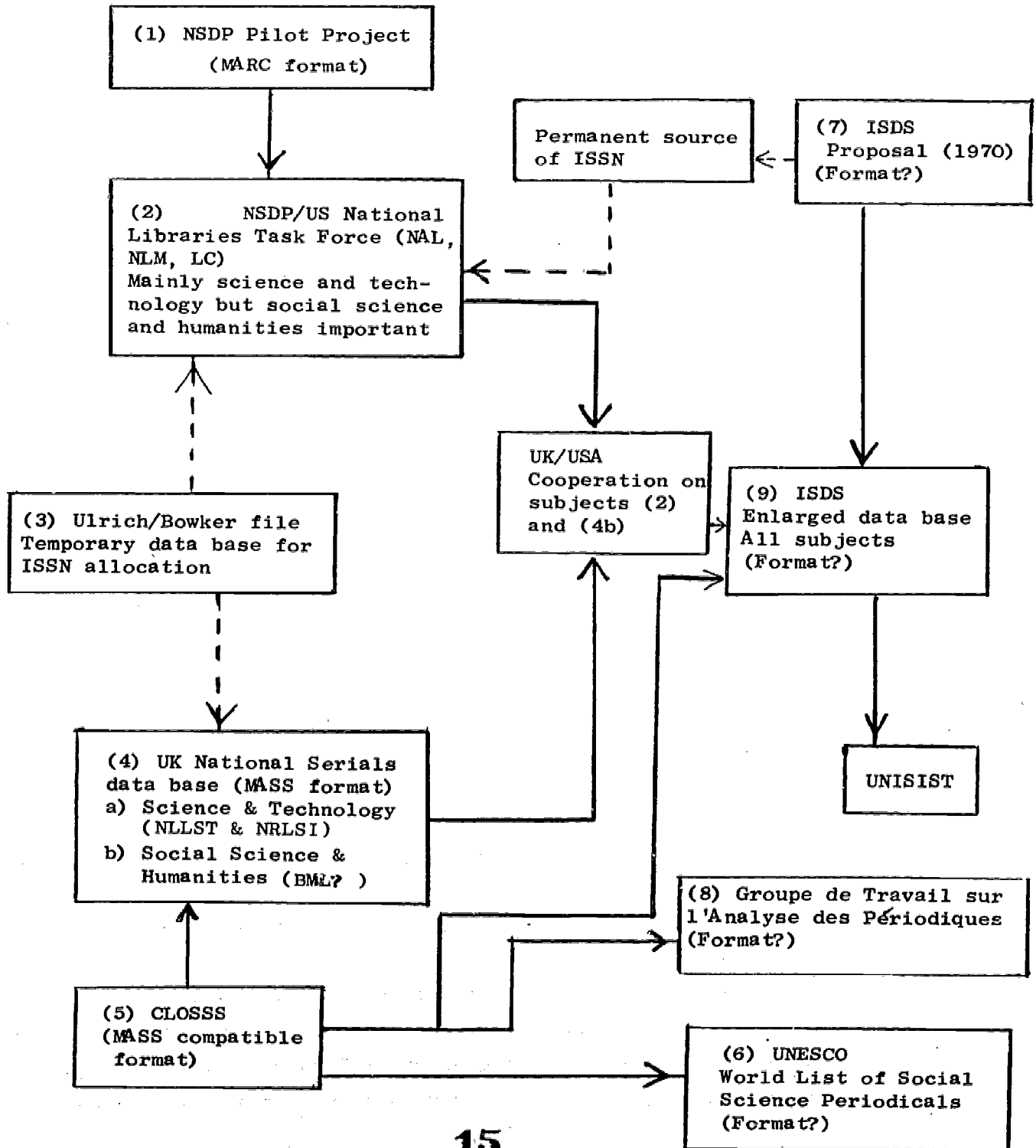
5.1 National and international serials data projects

Diagram 1 sets out some of the features of the present international situation on serials mechanization. In most cases the ultimate objectives of the projects are the creation and maintenance of comprehensive files of machine readable serials data which can be exploited in a variety of ways.

The relationships in Diagram 1 are shown through format specifications for the serials records. There is no coordinated plan as yet developed for all the various schemes, but potential opportunities for closer links are apparent. It would appear not unreasonable to press for the adoption of one standard record format and tagging structure based on MARC/MASS proposals, irrespective of number and type of data elements. Present international thinking seems to be moving, however loosely, towards coordination. A catalyst is required at this stage in the form of a firm commitment to a MARC/MASS format. CLOSSS could provide such

DIAGRAM 1

EXCHANGE OF SERIALS DATA



a stimulus if it goes ahead as planned, since it will represent within 12-18 months a uniquely comprehensive list of social science serials meeting a significant portion of MARC/MASS data requirements.

For national and international schemes CLOSSS could form the source of social science serials records. Developments in the next 12-18 months in UK and USA national projects (e.g. British Library, National Serials Pilot Project) could exert a strong influence on 'in-pipeline' schemes like ISDS. These developments are very relevant to any proposal for the development of CLOSSS in future. Any large scale international development would benefit in the long run if national schemes were clearly outlined soon to provide a firm base of expertise and data.

The diagram shows that if CLOSSS adopts a MASS compatible format it will be conveniently placed to feed in to current and future serials data base projects. The arrangement of the main schemes, particularly those involving cooperation between the USA and the UK, is by no means firmly established but it seems reasonably probable. North American resources could cover the field fairly comprehensively on their own, but a division of labour based on national collections of machine readable data is sensible. It could accelerate the projects and allow good use of existing resources, such as the Bowker files (Ulrich's international periodicals directory; Irregular serials and annuals), which together contain about 75,000 records and may well form the base for ISDS and the ISSN scheme. The Bowker file would satisfy most libraries' requirements, based as it is on titles sold to libraries in the USA.

If and when a general international scheme with compatible formats is agreed, detailed bibliographic work could be done locally and progressively and the data exchanged and pooled later, avoiding the need for a large clearinghouse organization for serials information. UNISIST might take on the overall coordinating function at a future date, particularly where file maintenance is concerned. However, file creation can go ahead on existing resources, well in advance of UNISIST, and so be ready to meet future needs. The most important feature is that the linkages suggested in Diagram 1 represent possibilities based on record formats, and it is most important that all bodies concerned at present should be thinking in the same direction, preferably towards a compatible approach based on MARC or MASS. The American Psychological Association amongst others uses a MARC record format for its tape service, and this

trend could well be encouraged. Through the use of a common record format a secondary service data base, such as those developed at APA, could be directly fed in to a modelling exercise.

5.2 Bibliographic reference tools

With a machine readable data base it is relatively easy to produce hard copy listings, and the use of computer typesetting would enable a very attractive bibliographic tool to be produced from CLOSSS, if the records were properly tagged. Bibliometric refinements to the data base would make it possible to structure the list in a variety of ways. KWIC and KWOC indexes could be produced and would make the list a useful tool - a feature lacking from many existing lists. On-line searching and selective analyses of the file for bibliographic purposes would be possible. A marketable magnetic tape version could be produced, and such a tape could, if formats allowed, be used with other data bases; there would be no necessary restriction to social science materials.

To achieve these objectives it would be necessary to edit and supplement the present CLOSSS file. DISISS is already considering ways of updating the CLOSSS file. There would not necessarily be a great overlap with ISDS, which at least in the short term does not plan to cover the social sciences. Where possible compatible schemes should be regarded as complementary.

5.3 Union listing

Although computer based systems make union lists easier to maintain, the case for producing them in future could be limited, particularly with the possible development of comprehensive loan collections of serials. A machine readable file such as CLOSSS could potentially contribute to union list projects.

5.4 Updating the UNESCO World List of Social Science Periodicals (WLOSSP)

This list of social science serials was not adequate by itself as a basis for the DISISS bibliometric studies, since it contains only a nucleus of specifically social science serials; in all 1,313 titles are recorded. Although WLOSSP is updated by supplementary information in the International Social Science Journal there is at present considerable delay in disseminating it in a cumulated form.

If CLOSSS reached hard copy in the next two years, when a new edition of WLOSSP is likely to be available, there would be some redundancy. However, the two projects are in some ways of different design and conception, so that the problem of conflict is not so pressing. CLOSSS serials data would certainly be relevant to the maintenance of the WLOSSP file, now being considered for machine-readable production.

The whole issue of updating local and pre-existing files is complicated by current uncertainty on international developments. UNISIST, for example, has discussed a central registry of scientific serials, presumably based on ISDS. An international archive of serials data could influence the scope and pace of local developments. Some attempt at least should be made to reduce duplication of effort.

5.5 Library management

Research on quantitative analytical techniques in library management like that done at Lancaster University Library (Buckland et al., 1970), and the analytical bibliometric methods being explored by DISISS on characteristics of secondary services, reviews and citation patterns are both concerned with statistical hypotheses like the Bradford-Zipf-Mandelbrot empirical hyperbolic distributions (Fairthorne, 1969), used to describe features of the documentation and information process. Both areas of research seek to improve efficiency, to provide users with a more effective service and to effect rationalization in the design and operation of information systems.

At some point the applications of statistical hypotheses in library service provision and information/documentation organization may meet to resolve both practical and theoretical problems in information science. Library management applications are currently focussed on the conduct of technical services and on stock control, e.g. loan policies, weeding and acquisition policy.

It is not yet clear how CLOSSS could contribute directly to these areas, but in the form of a comprehensive store of social science serials data, possibly applied to bibliometric analyses of literature, it could be exploited to serve library management ends.

5.6 Bibliometric applications

The techniques of bibliometric investigation and control of information systems are not very advanced at present, nor are they likely to be so for several years. Ideas in the area are still 'soft', compared with 'hard' proposals on data exchange and record formats.

CLOSSS and the other data bases mentioned here form the basis of the DISISS investigations into the applications of bibliometric methods. A major effort is being made towards the development of clustering techniques for use on citation data. Empirically generated journal clusters can be compared with existing subject concepts and the treatment of bibliographic information in subject oriented secondary services, review literature and other information retrieval devices. An extension of the work already undertaken by Salton, Kessler and Garfield based on computerized retrieval systems is a possibility. DISISS will, however, attempt to apply techniques and findings to conventional bibliographic tools and services, rather than to on-line interactive retrieval systems.

Extensive data base development is essential for this experimental work. Moreover the basis of the work can be broadened by access to compatible data. Producing CLOSSS and other data bases with MARC/MASS compatible records seems to be a good way of helping to advance bibliometric work (provided that MARC or similar records are generally accepted), enabling models to be tested in a variety of experimental situations.

Future information systems require predictive and regulatory mechanisms if they are to be sensitive to user requirements. Bibliometric methods could provide the type of control necessary in future systems. Eventually a large proportion of available bibliographic information might be in machine readable form, and the experimental data bases might constitute the whole population or random samples from it. The ISDS proposal points out the analytical potential of a serials data base; DISISS could in effect pilot many of the possible analyses which could then be applied in the context of international information control when a comprehensive system like ISDS becomes operational.

Although, to be realistic, an information control system using computer based bibliometric techniques is going to be at least five years from realization, at a feasibility study level contacts are being made by DISISS with bodies like the Institute of Scientific Information and ICSU/AB. What is essential, and can be done now, is to ensure provision for the exchange of experimental bibliometric and conventional bibliographic data.

6.0 CONCLUSION

From technical and conceptual viewpoints the proposed machine readable data base of social science serials in exchangeable format looks an attractive proposition as a short term research tool, with inherent long term possibilities. Some general issues need to be resolved before the future development needs of CLOSSS can be estimated. Briefly, the major issues are as follows, and relate not only to social science serials:

- (a) Record format. This topic has dominated the present discussion and is absolutely central to any international serials data programme. Formats derived from MARC and compatible with it should be considered essential for serials data base projects.
- (b) Time schedules. By 1973 the DISISS Project will have produced a substantial amount of bibliometric data analyses and software. National and international schemes should have progressed further, and some idea of the situation in about three years' time is required for planning purposes.
- (c) Organization and management. The best means of coordinating work on serials data should be sought. The most effective means means of cooperation could be under the auspices of ISDS.
- (d) Coverage. A high level of subject coverage of titles, both current and retrospective, is required. The exact division of responsibility between subjects needs investigating in the context of international cooperation. Ultimately a high standard of collection of serials information is required. A standard set of descriptive data elements is needed.

Adequate facilities for data collection are desirable and the planned role for ISDS is an important consideration.

- (e) Resources and costs. Reducing the duplication of effort, e.g. through coverage plans, is a positive step towards the best allocation of resources and control of costs. Continued work on CLOSSS as a major file of social science material would require some additional expenditure, although it is unlikely to be excessive.
- (f) Strategy for bibliographical control. Such a strategy is implicit in the development of UNISIST and ISDS. It is essential that their scope is enlarged to include the social sciences.

In the immediate future, work on CLOSSS must be more or less self-contained within the DISISS project. However, experience gained and data collected during the project should not be wasted if plans are laid which would facilitate re-use of data. Compatible record formats would enable re-use of data and further allow use of files of data generated by other projects.

CLOSSS is a contribution to a comprehensive programme of bibliometric research, which is potentially useful in assisting the design and operation of information systems. It is essential that such a programme should combine the theoretical with the practical. The type of serials data base proposed in CLOSSS offers this prospect of blending theoretical and practical areas together. On the one hand it promises to be a useful bibliographical tool, on the other a means of achieving certain ends of theoretical research as a result of which practical action can be taken. Central to the realization of theoretical and practical ends is a compatible machine readable serials data base.

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APPENDIX

Data Collection Sheets

PILOT VERSION

DISISS - SERIALS DATA RECORDING SHEET

PLEASE NOTE

- (1) When working in the field collect data where possible from inspection of copies and the catalogue of serials where available
- (2) Checking from published bibliographies will be done later by the editors, especially for items not marked (*)
- (3) Do not spend more than 5 - 10 minutes on any problem. Rechecking will be done later by editors. Try and collect at least those marked (*)

NAME OF COLLECTOR

LIBRARY WHERE
DATA COLLECTED

VOLUME (OR ISSUE(S)) OF ITEM FROM WHICH DATA RECORDED ON THIS SHEET REFERS (PARTICULARLY QUESTIONS: (10), (12), (13), (14), (15), (16), (17), (18) and (19), WHERE THE DATA IS VOLUME/ISSUE SPECIFIC

VOLUME

ISSUES (Where data does not apply to whole volume)

DATE

DATA ELEMENTS

THE ITEMS (*) SHOULD BE THE MINIMUM RECORDED

*(1) TITLE (In full, as it
appears currently)

(2) ALTERNATIVE TITLE(S)

(3) FORMER TITLE(S)

*(4) TITLE IN ENGLISH IF
DIFFERENT FROM (1)

(5) PUBLISHER

(6) PUBLICATION SPONSOR

(i) Commercial
(ii) Learned society or professional body
(iii) : (i) + (ii)
(iv) Government
(v) State monopoly

<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

(vi) Educational institution
(vii) : (ii) + (vi)
(viii) : (i) + (vi)
(ix) Private body or firm
(x) International organisation

<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

*(7) BEGINNING DATE

*(8) ENDING DATE, IF ANY

(9) COUNTRY OF PUBLICATION

*(10) NUMBER OF ISSUES PER ANNUM

*(11) TYPE OF SERIAL

Periodical ☐

Monographic series ☐

*(12) TYPE OF MATERIAL

Journal ☐
Abstracts ☐
Indexes ☐
Contents list ☐
Book review ☐
Bibliography ☐
Statistics ☐

Index to research/theses ☐
Yearbook ☐
Fixed period report ☐
Conference proceedings ☐
Legal (legislation, report, articles) ☐
Cases and case notes ☐
Accessions list ☐

*(13) NATURE OF CONTENTS

Indicate three main areas
by a cross. Tick for
minor features

Articles ☐
Abstracts ☐
Indexes ☐
Bibliographies ☐
Contents lists ☐
Book reviews and
new publications ☐
(Not advertisement)

Statistics ☐
Conference proceedings ☐
Cases and case notes ☐
Accessions lists ☐
News articles ☐
Review articles ☐

*(14) LANGUAGE(S) OF CONTENTS

(15) SUBSCRIPTION PRICE (1969)

(Please indicate where
alternative data is used)

(16) COVERAGE BY INDEXING AND ABSTRACTING
SERVICES (Where this is listed within
the item)

*(17) ABSTRACTS WITH ARTICLES

All main articles ☐

None ☐

*(18) NUMBER OF ARTICLES in 1969
(Listed main article in index/list of contents)

*(19) ASSESSMENT OF SUBJECT CONTENT

Take as guidance the prepared list
of subject headings in the Manual
and use or modify accordingly

FINAL VERSION

DISISS - SERIALS DATA RECORDING SHEET

- PLEASE NOTE**
- (1) When working in the field collect data where possible from inspection of copies and the catalogue of serials where available
 - (2) Checking from published bibliographies will be done at the editing stage, especially for items not marked (*)
 - (3) Do not spend more than 5 - 10 minutes on any problem. Rechecking will be done later at the editing stage. Try and collect at least those data elements marked (*)

NAME OF
COLLECTOR

LIBRARY WHERE
DATA COLLECTED

VOLUME (OR ISSUE(S)) OF ITEM FROM WHICH DATA RECORDED ON THIS SHEET REFERS (PARTICULARLY QUESTIONS: (7), (12), (13), (14), (15), (16), (18), (19) and (20)), WHERE THE DATA IS VOLUME/ISSUE SPECIFIC.

VOLUME

ISSUES (where data does not
apply to whole volume)

DATE

DATA ELEMENTS

THE ITEMS (*) SHOULD BE THE MINIMUM RECORDED

* (1) TITLE (In full, as it appears currently)

* (2) TITLE IN ENGLISH IF DIFFERENT FROM (1)

(3) ALTERNATIVE TITLE(S)

(4) PREVIOUS TITLE(S)

* (5) BEGINNING DATE

* (6) ENDING DATE, IF ANY

* (7) FREQUENCY/ISSUES PER ANNUM (Indicate year taken)

(8) ISSUING BODY

(9) TYPE OF ISSUING BODY

Association(s), <input type="checkbox"/>	Government <input type="checkbox"/>	International Organization <input type="checkbox"/>
Society, Prof. Body <input type="checkbox"/>	(National, Local) <input type="checkbox"/>	(i.e., UN, EEC, NATO) <input type="checkbox"/>
(Membership instns) <input type="checkbox"/>	Educational institution <input type="checkbox"/>	Commerical/business enterprise <input type="checkbox"/>
Publisher <input type="checkbox"/>	Political/pressure groups <input type="checkbox"/>	Private/individual <input type="checkbox"/>

OTHERS (Description/type)

(10) PUBLISHER (Name)

(11) COUNTRY OF PUBLICATION

* (12) TYPE OF SERIAL

Periodical ☐ Monographic series ☐

* (13) DESCRIPTION OF SERIAL (Tick one category)

Periodical journal <input type="checkbox"/>	Bibliography <input type="checkbox"/>	Fixed period report <input type="checkbox"/>
Abstracts <input type="checkbox"/>	Statistics <input type="checkbox"/>	Conference proceedings <input type="checkbox"/>
Indexes <input type="checkbox"/>	Index to research/theses <input type="checkbox"/>	Legal/legislation, report articles <input type="checkbox"/>
Contents list <input type="checkbox"/>	Yearbook <input type="checkbox"/>	Cases and case notes <input type="checkbox"/>
Book reviews <input type="checkbox"/>		Accessions list <input type="checkbox"/>

OTHERS (Indicate type)

* (14) NATURE OF CONTENTS (Indicate major categories by cross and minor features by tick)

Articles <input type="checkbox"/>	Contents lists <input type="checkbox"/>	Cases and case notes <input type="checkbox"/>
Abstracts <input type="checkbox"/>	Book reviews and new <input type="checkbox"/>	Accessions lists <input type="checkbox"/>
Indexes <input type="checkbox"/>	publications (not <input type="checkbox"/>	News articles <input type="checkbox"/>
Bibliographies <input type="checkbox"/>	advertisements) <input type="checkbox"/>	Review articles <input type="checkbox"/>
	Conference proceedings <input type="checkbox"/>	

OTHERS (Indicate type)

* (15) ABSTRACTS WITH ARTICLES (Tick in boxes)

All main articles ☐ Some ☐ None ☐

* (16) LANGUAGE(S) OF CONTENTS

* (17) ASSESSMENT OF SUBJECT CONTENT (Take as guidance the prepared list of subject headings)

* (18) NUMBER OF ARTICLES IN 1969
(Listed main articles in
index/list of contents)

(19) SUBSCRIPTION PRICE (1969)
(Please indicate where
alternative data is used)

(20) COVERAGE BY INDEXING AND ABSTRACTING SERVICES (Where this is listed within the item)