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ABSTRACT

To identify the essential core of statistical data needed to plan improvements in library and information services in the United States, one must examine some recent trends in public administration methods and their potential applicability to the library field. Public administrators increasingly regard planning as a cycle: perception of needs, formulation and comparison of options, transmission of findings to decision makers, and evaluation. In the United States, the local autonomy of libraries has inhibited coordinated planning. However, a formal national focus for planning has been created in the National Commission on Libraries and Information Science (NCLIS). In the absence of adequate statistics, NCLIS has relied on expressions of need from the field. Proposals and projects are not as likely to secure support on this basis as they would when targeted to well-defined activity loads/needs, cost-effectiveness data, and evaluation plans. To be relevant to these uses, data must meet the standards of timeliness, appropriate coverage, credibility, and clarity. Shortfalls in these respects can be avoided by careful articulation of data needed and by the standardization of formats. Basic library resource and performance data should be systematically available soon. (Author/SL)

STATISTICS IN PLANNING FOR NATIONAL INFORMATION SERVICES

U.S. DEPARTMENT OF HEALTH
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

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Statistical Development, National Center
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Introduction

This paper considers what critical statistics are needed by those concerned nationally with the development and improvement of library and related information services in the U.S. The starting point in such planning, in my view, must be the current condition and trends in information services and the new concepts and proposals under consideration and just emerging. To identify the essential core of statistical data and services needed, we examine some recent and emerging trends in quantitative methods in public administration and their potential applicability to library programs and other information services. The present stage of availability and use of statistics about libraries and for libraries are described in part incidental to presenting my personal views of some priority needs for early developments in library statistics and related areas in the United States. These possibilities, and the program issues to which they relate, are unique to the United States, but the concepts and approach suggested herein may be useful in some degree in each of your countries.

"Planning" is a ubiquitous concept, whose meaning we think of as common sense: something like forethought to provide for future needs, a function of personal prudence, often intuitive. But planning for an institution, over a range of

¹This paper is an independent professional analysis of the writer; the views expressed here do not necessarily represent policy or program plans of the U.S. Department of Health, Education, and Welfare.

contingencies becomes complex, requiring sensitivity to varied interests and values, and tends to be made more overt and visible. And planning for a nation's long-term development of its information services calls for some formalization of the planning activity, usually involving a division of labor and an extension of the activity in time. One reason is to bring to bear specialized expertise; another is to involve (or give opportunity for participation by) varied interests and thereby to build confidence in the acceptability of planning results. Increasingly, public administrators in the U.S. regard planning as a continuing activity, paralleling and monitoring operations. The planning aspect of management may be formulated as involving discrete steps, before action, of:

- . perceiving a need or an opportunity
- . generating ideas for addressing the need/opportunity
- . comparing the options (suggested approaches)
- . transmitting findings to decision-makers (and exchange of information among them).

This latter step is obvious for management decisions by a Board of Directors, or by a legislature, but it also applies in large hierarchical organizations in which more than one person participates in decisions. In this mode of management decision-making, these planning steps are followed by decision and action to implement a selected option. Thereafter, results are observed in forms appropriate for

- . evaluation

completing a first cycle of planning, and leading to a new cycle as the evaluation may suggest further needs or opportunities for change or for new initiatives.

Planning for national information services in the U.S. is considered in the first section. The statistical needs implied by self-conscious responsible planning, and the technical resources applicable to them, are explored in the

following section. Problems in applying available statistical support to planning are then recognized. Critical questions of how much statistics are required, when, and how the needed data may be provided, are examined for the United States, and some possibilities for doing such analysis in other settings are noted.

Some Elements in Current Planning for Library and Information Services in the United States

In the United States, libraries developed from local initiative and began on a self-help basis, usually to serve a single community or an individual organization. This genesis reflects our national emphasis on decentralized authority and responsibility. Autonomy has inhibited coordination among independent entities. The consequent small scale of operation means most libraries have very modest resources of books, staff, and means to access the knowledge beyond those of its staff and materials.

Many specialized information requirements have not been addressed by libraries. Particular needs have justified evolution of new somewhat similar activities, including Information Centers (such as the Educational Research Information Center [ERIC] managed by the National Institute for Education), and Data Banks from which statistical information in a particular field or fields may be obtained. To illustrate again from the field of education, The National Center for Education Statistics has made available a substantial computerized data base of current education statistics on-line, available through remote terminals, called EDSTAT, and is adding data files to EDSTAT rapidly. Many of these new services use advanced technology heavily: computers, telecommunications, microforms.

Despite the new Special Libraries and Information Centers and Data Banks, many observers judge that over time we are falling further behind in effective access to

the burgeoning body of knowledge. Many national interests continue to plan, from their own standpoints, for ways in which they may constructively contribute to the needs as they see them. In addition, however, a formal national focus for planning has been created in the National Commission on Libraries and Information Science (NCLIS), which Dr. Burkhart, its Chairman, has described to IFLA. I will relate these remarks on statistics for national-level planning to the Commission's second draft "National Program," for concrete illustrations, recognizing that other plans for specific national activities also have statistical implications.

The Commission's stated objective is "to develop a National Program that offers the most information service to the greatest number of people." It further states a guiding ideal: "To eventually provide any individual in the U.S. with equal opportunity of access to that part of the total information resource which will satisfy his educational, working, cultural, and leisure-time needs and interests, regardless of the individual's location, social or physical condition, or level of intellectual achievement." Eight Program Objectives have been delineated which address the improvement of human and other resources supportive of high quality information services and look toward voluntary interconnection of existing facilities and existing networks into a nationwide network.

In terms of the planning elements suggested earlier, the Commission has articulated its perception of certain needs, and presented them for public discussion in general, non-quantitative terms. Specific actionable suggestions are yet to be elaborated; my own bias is to hope that NCLIS and the professional community will seek to describe alternatives to implement each objective. In any event, specific proposals will be critically assessed in terms of expected consequences, favorable and unfavorable (in the language of management scientists,

a "benefit-costs analysis"). And the on-going evaluative or monitoring system which will be desired might well be considered soon, as well: how should it differ from the evaluations we have now of our highly decentralized information activities?

Statistics for Planning

The first step in planning is assessment of needs/opportunities for library and information service programs. A gap is asserted with most confidence if it results from a quantitative comparison of needs to services currently or prospectively offered, or perhaps from a direct measurement of unmet needs, by appropriate statistical surveys and reporting systems. In the absence of adequate statistics, NCLIS has relied largely on expressions of need at hearings held throughout the country and informed judgments by professionals for a finding that there exist large unmet needs for access to knowledge. The Commission states that it "is keenly aware that much more must be done systematically to understand the information needs of various special constituencies -- such as the economically disadvantaged, the uneducated, and the handicapped. We need to know who they are, where they are, what they need, how fast they need it, and the value - to them and to society - of increasing their access to information and knowledge..." To understand the unmet needs in perspective, service demands should be measured and compared with current services and service capacities. Indeed the lack of such measures, not only by groups of users and types of use, but by levels/kinds of information services, probably has delayed NCLIS presentation of more specific program objectives.

Some general directions of development -- such as the national network proposal -- may be capable of logical support without such specific quantitative measurement of the market for additional services. But definitive action

proposals are not likely to secure support on the basis of general statements of need; they tend to be more convincing when targeted to well-defined and confirmed activity loads/needs. This step of offering alternative projects typically involves synthesizing cost estimates for each candidate process or approach to serving the needs. So we need, from practical experience with similar activities, time and costs factors for elemental processes in order to design possible new technical activities or processes. Other research data needed include learning curve parameters, and economy-of-scale characteristics, so that marginal costs as well as average costs may be considered. Initially, generating new ideas for services is a function of the imagination of the professional librarian and/or that of the specialist user. Statistics enter this step primarily to test the gross feasibility of the idea.

The comparison of options is the crucial step, involving at its best highly sophisticated value and effectiveness and costs concepts and measures. For illustration, let us consider comparing different means for meeting new skill requirements for our libraries. The Commission's fourth program objective: "Develop and continually educate the human resources required to implement a National Program" might be detailed (using information from sources such as the recent Library Manpower Study and North American Library Education, Directory and Statistics, 1971-73) to include, for example, something like: Produce an average of 500 Media Specialists qualified with the MLS and a major in instructional technology per year over the period 1978-1985. Hypothetically, means of attaining this goal might be postulated: Expand, or shift emphasis in, ten existing graduate schools of Library Science; Provide fellowships for fully qualified (MLS) librarians interested in doing so to take a special curriculum in instructional technology for one semester (full time); Provide courses in

instructional technology on an external degree basis so that employed librarians could, while working, gradually acquire the additional specialist training. The three alternatives would have different costs to the student, and to society; they would have different impacts on the educational system; they would also have somewhat different products (and the comparison of effectiveness of the graduates is difficult to predict, unless some prototypes have previously existed); and they would differ in the effects on the size of the total supply of professionals for library jobs. So far as feasible, these comparisons should be guided by real data on costs and on various dimensions of effectiveness, recognizing that benefit-costs or costs-effectiveness analysis usually require some ad hoc special study efforts.

Once consensus has been reached, the implementation of a program should be accompanied by fully developed arrangements for its monitoring and evaluation. This may mean a continuing statistical "quality control" type of process, recurring reporting and analysis, or intermittent analytic studies. Upon decision to proceed with a national network (one of the Commission's key program objectives), for example, it will be important to monitor the pace of its implementation (to help avoid falling short of projections and incurring discouraging initial diseconomies). On-going information significant to the nation as a whole will include the extent of utilization by participants of different categories, operating ratios such as rates of failure to meet specified performance and productivity and cost levels, and trends in market potentials and in service operations. Follow-up studies, to assess the longer-term effects of training, and of innovations in service, for example, are valuable further assessment approaches contributing to national planning, though they are both expensive and technically difficult to design and conduct. Evaluative statistics, as they emerge, will suggest managerial adjustments, or will provide reassurance that the activity is functioning effectively in relation to a continuing genuine need.

This brief sample of statistical needs associated with planning for information services is suggestive rather than prescriptive. Data to be relevant to these uses must meet standards of timeliness, appropriate coverage, pertinence to the decisions, credibility, and clarity and utility. Shortfalls in these respects too often frustrate the executives' planning and efforts to use available statistics for current decisions. Such shortfalls deserve attention in the interest of facilitating a high calibre of planning at the national level, and a high level of confidence by the public and the legislators in the viability of specific proposals set forth. Among the steps which I identify in order to avoid failures to access statistics for planning as needed, are:

- general application of professional statistical standards, including common definitions and measures and valid standardized statistical techniques and operations;
- participation by planners and decision-makers in articulating the kinds of data needed;
- hard decision-making by NCLIS, the profession, the Federal agencies, concerning what selective statistics about libraries are to be collected and what special studies are needed, and allocation of the necessary resources to do well the data collections and studies which are undertaken;
- thoughtful attention by libraries and librarians to their own needs for local management purposes, for selective quantitative data, and to the usefulness on the larger scale, for the general benefit, of key data;
- increased analysis using statistics about libraries and other demographic, economic, and knowledge statistics to address questions of how libraries can better share resources and interchange services toward the goals expressed persuasively by the National Commission.

Potentials for Library Statistics for the Seventies

In the expectation that the National Commission proposals will continue to command substantial attention and debate, I submit that hard data along lines

indicated herein will be necessary to responsible deliberation and decision on the appropriate pace of development. Data applicable to these judgments include much information about the population, generally available through the Census Bureau; data about the knowledge industries (R&D data, book publishing data, information on articles and monographs---), which is not available on a comprehensive standardized basis; statistics and other quantitative knowledge about libraries and information centers, and about manpower and other technical resources applicable to this field.

Basic library resource and performance data will be published over the next two years from surveys conducted or supported by the National Center for Education Statistics. As the Library General Information Surveys (LIGIS) system (described to IFLA at the 1973 meeting in Grenoble, and updated in a report to the pre-conference meeting of the Statistics and Standards Committee a few days ago) is implemented, such basic data about libraries will be systematically available.

Further, two standards-setting efforts are under way, sponsored by the National Center. The Library Statistics Operations Handbook is being prepared by the ALA Statistics Project. The Educational Technology Statistics Handbook is being prepared by the Association for Educational Communications and Technology. Both of these projects have been reported to the second session of the Committee at this meeting. These are expected to provide the framework of standard terms and procedures which many users can apply to their own inquiries with minimum risks of uncoordinated approaches and incompatible findings, separate but related parts of the large domain to be developed.

These two roles of NCES, collecting and providing basic library data on a recurring basis through the system of Federal-State-local reporting,² and initiating standardization efforts in respect to such data, are integral to our general statistical responsibilities for education as a whole. We wish to coordinate these efforts, necessarily limited in extent, to the many related kinds of research and statistics activities discussed here. We value the Handbook activities especially as a basic instrument of such coordination.

Parenthetically, I wish to share with you something of our experience in developing both of these roles. In developing LIEGIS, and in developing the Handbooks, the National Center has had full active participation by the profession and by State library agencies and individual libraries. We have found this participation highly constructive, bringing to bear the diverse conditions and experience across the nation to perfect systems for nation-wide use and utility. In one sense, these enterprises are small scale precursor pilot-tests of the nation-wide cooperation and collaboration envisioned in the national network proposition. It is important to report that such involvement does have costs: the time required for extensive participation is substantial. We feel it is worth it.

Turning to the broader scope of data needs for planning, I am very pleased that the National Commission has retained consultants to prepare a planning paper on library statistics. Such a study can contribute significantly to identifying the data requirements of the library planning community.

Perhaps more important, it can be the catalyst for the Commission, our national policy and planning commissions, the social sciences, to infuse substantive planning with quantitative and quantitative justification and analysis. It is not an end in itself, but an approach to help in the deliberations, and it is not a substitute for what are important policy decisions. It is a tool which we need then.

The profession is the institution which is responsible for storage and retrieval with, I am confident, the help of the computer along these lines. At the same time, I propose that the profession forward concurrently in their own role as analysts, and as analysts, the key concept of the energy of the profession is interlinking healthy and effective national and international network for sharing their strengths. The vitality of the profession depends on its initiative, professional development, which is strengthened by quantitative evidence of the effectiveness of the available to respond to the demand. I believe that the professional directors will know, quantitatively, as well as qualitatively, that served, the expansion of services for the individual and society across from the measures of the resources which the profession is a parameter related with the

The critical issue in achieving the coordination and cooperation envisioned may well be to act rapidly enough to standardize approaches before separate networks invest heavily in incompatible systems which limit their later ability to create new linkages because of sunk and inflexible hardware and software. The analytic effort to identify such potentials, and to develop timely viable proposals for the longer run is highly important to us all.

We in the United States will undoubtedly experiment for some time with new modes of sharing resources and services, and will grope toward more effective ways to guide that effort through statistics and other quantitative data. We recognize the importance of sharing with sister nations in analogous ways, and the value of international statistics on resources and interchanges and costs. I commend the Statistics and Standards Committee of IFLA, and encourage it to continue its active cultivation of potentials for improved information standards and statistics and statistical tools, especially classification tools, sample survey methods, and analysis techniques. Substantial conceptual and technical advances are necessary to bring into practical reach many of the kinds of statistics and data-based systems suggested herein as aids to national planning in this field. Recognizing this, let us hasten to move forward.