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ABSTRACT

This project examined a series of alternative policies for the management and funding of university libraries as they adopt and adapt to various information science technologies to accomplish the functions of acquisitions, cataloging, circulation, and reference services. Comparative case studies were completed at the University of Chicago, Northwestern University, Stanford University, and the University of Washington. Interviews were conducted with 216 university librarians and administrators during 84 days of fieldwork. Data reporting on the impact of automation were analyzed in four organizational dimensions: structure, fiscal, information, and personnel. Policy implications of this research were explored for three major areas: future governance structures of university libraries and resource sharing consortia; continuous structural and functional change resulting from automation; and emergent new forms of organization in university libraries. (Author/SD)

Final Report

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THE IMPACT OF AUTOMATION ON LIBRARIES

September, 1980

U.S. DEPARTMENT OF EDUCATION

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Abstract

This project was designed to examine a series of alternate policies for the management and funding of university libraries as they adopt and adapt to various information science technologies to accomplish the functions of acquisitions, cataloging, circulation, and reference services. Comparative case studies have been completed at The University of Chicago, Northwestern University, Stanford University, and University of Washington. Interviews were conducted with 216 university librarians and administrators during 84 person-days of fieldwork. Data reporting on the impact of automation were analyzed in four organizational dimensions: structure, fiscal, information, and personnel. Policy implications of the research were drawn out in three major areas: future governance structures of university libraries and resource sharing consortia, continuous structural and functional change resulting from automation, and emergent new forms of organization in university libraries.

I. Introduction

This document is the final report on the project, "The Impact of Automation on Libraries and Information Services." The project was designed to examine a series of alternate policies for the management and funding of university libraries as they adopt and adapt to various information science technologies. The study draws upon the theoretical perspectives promulgated in the social science literature examining the impact of technology upon the structure and functioning of complex organizations, and it is intended to augment that literature by including a heretofore unstudied class of organizations, university libraries. Policy recommendations are addressed to library managers, university administrators, funding agencies, and graduate schools of library and information science.

Case studies have been completed at The University of Chicago, Northwestern University, Stanford University, and University of Washington. The case studies focus specifically on the accomplishment of the four major functions of university libraries: acquisitions, cataloging, circulation, and reference services. Interviews have been conducted with 216 university librarians and administrators during 84 person-days of fieldwork. Interview data have been complemented with materials collected from existing statistical summaries and reports in each of the libraries.

The final product of this project is a book-length research monograph prepared for commercial publication. The monograph is now completed. The Table of Contents for the monograph is as follows:

The Impact of Automation on University Libraries

I. Introduction

II. Structure

III. Fiscal

IV. Information

V. Personnel

VI. Summary and Conclusion

II. Methods

A case study is characterized by the intensive investigation of a selected unit. It is particularly fruitful for stimulating insights,

suggesting hypotheses for future research, and identifying major consequences of social change. The power of the case study is dramatically enhanced when it includes several sites for comparison. The research design used in this project was comparative organizational case studies. In this design, the investigator examines in detail a small number of organizations using a comparable set of data collection techniques including interviews, observations, and the analyses of existing reports and statistical data. Because case studies require intensive study of one unit, they are usually expensive to conduct. Whether a project is limited to one case study or employs the comparative case study design, the generalizability to other organizations is always questionable.

At the most general level, the strategy employed in this project attempted to maximize the comparability of comprehensive objective data collection and analysis in each of the four libraries. This strategy required careful advance planning of all interviews and observations and effective yet flexible adherence to project schedules. Data reduction and analyses followed prespecified rules for verifying the accuracy of all information. Yet careful compliance to this strategy and the many specific guidelines still left the investigators facing the very difficult question of precisely what information to collect in the case studies. By its very nature, the case study implies comprehensive data collection, i.e., get all the information. But this is impossible, for in a very real sense the amount of data that can be collected on any organization is infinite. It was necessary to select certain aspects of the organization for emphasis, and the focus on acquisitions, cataloging, circulation, and reference services provided general guidelines in this selection process.

In this study it was essential that the libraries be chosen carefully to insure variation along the dimension of the degree of automation in each of the four functional areas. In addition, it was decided to select institutions of roughly comparable magnitude with respect to the size of the collection, the number of professional staff, and the size and heterogeneity of the user community. It was also decided that geographical distribution and public and private auspices of the host institution would also be relevant for selection.

Four institutions were initially invited to participate: The University of Chicago, Stanford University, University of Toronto, and University of Washington. Unfortunately, the University of Toronto declided the invitation on the grounds that it was in inopportune time to conduct such a study. After further consideration, Northwestern University was invited to participate and readily accepted.

Much effort was expended in developing rapport with the senior administrators in each institution. Each library director was sent a lengthy letter of introduction describing the goals of the project, proposed on-site research activities, and references who could be employed to assess the investigators' credentials. Subsequent telephone calls were then placed to determine if the library was interested in participating. The letters also allowed the director to consider the invitation thoughtfully. They provided a convenient vehicle

for sharing the invitation with other senior library staff. It was decided that an initial telephone call that was not preceded by a letter could prompt a decision without careful consideration of the implications of the response. The investigators were concerned that they might lose a participant who might have volunteered if given more time to consider the invitation. On the other hand, the investigators were also concerned lest they gain a volunteer who, later realizing the impact of the commitment, decided to terminate the participation, or worse still, might continue participation but at a minimum level of cooperation.

Initial, or pilot, visits of two days were made to all participating institutions. These visits allowed the library administrative staff to meet the investigators and discuss the project. Agreement to the initial visit required a lesser commitment of organizational resources, thus there was less reluctance to agree to such a meeting. The investigators also used the initial visits to learn more about the specific characteristics of each library, information which was crucial in planning subsequent fieldwork activities. During the visits interviews were conducted with senior staff members to gather these data. The visits usually began with a group meeting of the authors, the library director, and other key administrative staff members. During these sessions of one to two hours, the authors summarized the project history, theoretical perspectives, methodology, and anticipated outcomes. They also answered questions posed by the library staff.

The authors stressed that they were interested in collecting information to provide objective descriptions of acquisitions, cataloging, circulation, and reference services in each library. It was emphasized that there was no intention of evaluating the performance of any individual library staff member nor of complimenting or criticizing a single individual or institution. As outsiders to the library profession, the authors believed it was presumptuous to make judgments. Any recommendations forthcoming from the project would be directed generally to the profession of academic librarianship. It was also pointed out, usually to the great relief of all concerned, that no questionnaires would be distributed among the library staff. Furthermore, only already compiled statistical summaries and prepared reports would be requested.

After the group meeting, individual interviews were conducted with the heads of the four relevant units and others identified by the senior staff as particularly good informants on the organization of the library, particularly as it pertained to these four functions. These hour-long interviews focused on two topics. First, each person was asked to describe the organization, the unit or units under his or her direction, including a discussion of the flow of work through the unit and their responsibilities and staffing levels. Second, they were requested to describe the fiscal planning, spending, and reporting during a typical budget cycle.

Planning the fieldwork or second visits to each institution was greatly facilitated by the information gathered during the pilot visits. It is exceedingly difficult if not impossible to identify appropriate informants for interviews and activities for observation without this information.

Furthermore, an investigator naive to many of the complexities of an organization may relinquish control of who is selected for interviewing and what is selected for observation by individuals who step forward to inform him of his ignorance, thus introducing biases and jeopardizing reliability.

Following each visit, the investigators drew up a schedule of interviews specifically naming each library staff member and administrator they wished to interview. The schedule proposed a day, hour, and estimated time required for each interview. A list of topics to be discussed with each interviewee was also prepared so that the library director could both review the topics and forward the list to appropriate interviewees. All materials were sent to the library director with suggested dates for the fieldwork visits. Directors were then asked to make a final decision based on these materials and their reaction to the initial visits as to whether their institution would continue participating in the study. All agreed to do so.

The fieldwork visits to each of the four libraries varied in length from sixteen to twenty person days. In the initial visits, the investigators conducted mostly joint interviews, but in the fieldwork visits almost all interviews were conducted separately, the exceptions being typically interviews with the library director and the staff member primarily responsible for each of the four major functions. Some key informants were interviewed several times.

Interview topics varied from one individual to another, but generally the following areas were covered: job description, overall organization and operation of the unit or department, history of automation projects, plans for future automation activities, effects of automation on work flow, experience with on-line search services, and communication patterns. On the last topic, each interviewee was asked to name in decreasing order of frequency the other individuals with whom they most frequently interacted on work-related matters. Combining these data with information from both the formal organization charts and membership rosters of internal committees and task forces, it has been possible to create sociograms depicting and contrasting formal and informal communication patterns across the four libraries.

In addition to interviews, fieldwork activities included the following: 1) observations of routine operations, 2) observations of staff or special committee meetings, 3) participation in organizational activities, and 4) collection of existing documents produced by the organization. As in most field research, interviews and observations accounted for the largest blocks of time. In addition, the investigators presented a seminar to the library professional staff on their earlier research on collection development policies and practices in academic libraries.

In each institution, at least one interview was conducted with a person in the university administration. This was always someone who was concerned with overall fiscal planning and budgeting for the institution and had particular responsibility for determining the budget for the library. Who this administrator was varied from campus to campus, but always included either the provost or assistant provost or the dean of the faculty or graduate school.

After considering the various options for recording data during interviews, it was decided that notes would be taken during interviews and no audio or visual recording would be attempted. These notes were subsequently used for dictating a condensed version of the interview. An attempt was made to complete these dictations as soon as possible following the interview. Transcriptions were then made of the recordings and copy which could be shared between the investigators was available for the interviews. However, because of the very heavy schedule of fieldwork, most interviews were not dictated until much later.

All data collected in interviews and existing reports were subsequently reviewed and analyzed by the authors with three main purposes in mind. First, the data were synthesized to produce objective descriptions of acquisitions, cataloging, circulation, and reference services in the four university libraries. Second, the data were reviewed and organized to address a number of theoretical issues relevant to university libraries as formal organizations. These issues have been discussed at length in studies of other types of organizations, and their formulation and conceptualization can be significantly expanded when libraries as a new class of organizations are appended to this literature. And third, the data were carefully reviewed to identify possible policy-relevant topics concerning the future organization and operation of university libraries.

III. Results

The four institutions participating in the project provide a rich and diverse array of manual, semi-automated, and automated systems for accomplishing the functions of acquisitions, cataloging, circulation, and reference services. The chart below presents an oversimplified description of systems used in each library.

	Acquisitions	Cataloging	Circulation	Reference
Chicago	LDMS	LDMS	LDMS	LDMS Commercial
Northwestern	NOTIS	NOTIS	NOTIS	NOTIS Commercial
Stanford	RLIN	RLIN	Manual	RLIN Commercial
Washington	Manual	WLN OCLC	Manual	WLN Commercial

The University of Chicago's Library Data Management System, LDMS, is used to aid in accomplishing all of the above functions. LDMS was developed over the past decade with substantial support from outside public and private funding agencies. No financial support has been available for enhancing LDMS for the past year, and the system is now in transition from

a developmental to an operational phase. Hence, it was possible at Chicago to document the use of automated systems in a relatively mature and stable technological setting. The Northwestern On-line Total Integrated System, NOTIS, is also an integrated system developed solely with local resources. Since work on NOTIS started in the mid-1960s, Northwestern also provided a relatively mature technological site for observation. However, additional enhancements such as an on-line authority file, are underway, and the Northwestern environment is more dynamic than Chicago.

Stanford University and the University of Washington have significantly automated one or more library functions, but neither has an integrated system. Stanford, which is now the flagship library for the Research Libraries Information Network, RLIN, has automated acquisitions and cataloging of monographs. Serials control is not yet included. Circulation uses a manual system. All design and development work which will impact the Stanford University Libraries are accomplished by the RLIN staff with collaboration and assistance from the Stanford Computation and Information Center. The RLIN data base is undergoing rapid expansion as more academic libraries join the Research Libraries Group.

The University of Washington has recently become a member of the Washington Library Network, WLN. However, it more frequently employs the Ohio College Library Center, OCLC, data base for cataloging activities. Acquisition and circulation at Washington are accomplished using manual systems.

It must be stressed that the chart and summary statements presented above are gross oversimplications of an exceedingly complex and diverse pattern of task accomplishment in these four libraries and cannot be taken as a complete or definitive report. For example, although the chart indicates that both Chicago and Northwestern use their integrated systems in accomplishing acquisitions and cataloging, NOTIS includes serials control and LDMS does not. Another example of how this chart distorts a very complex set of data is demonstrated by the fact that although the Washington acquisitions system is primarily a manual operation, both the OCLC and WLN data bases are used for preorder searching. Perhaps the greatest oversimplification occurs in the reference column, where all institutions are depicted as having access to both commercial bibliographic search services as well as local or regional holdings information. But in fact, the institutions vary significantly in the amount and sophistication of automated reference services provided. For example, Stanford uses the same hardware for searching the RLIN bibliographic file and the commercial data bases.

IV. Conclusions

Policy implications of the research were drawn out in three areas. The first concerned future governance structures of university libraries, and the discussion focused on both governance within the university as well as organizational mechanisms which will oversee the various networks, utilities, and consortia in which university libraries increasingly participate for

resource sharing. The second topic examined the implications of the finding that automation sets in motion a continuing series of modifications in basic aspects of the structure and functioning of university libraries. These changes do not occur at one particular point in time but set up an organizational structure which then continuously undergoes further modifications. The third topic discussed was the manner in which automated activities in university libraries brings about changes in the traditional distinction between technical and public services. This discussion speculated on the possible outcome of the gradual eradication of this distinction and outlined a type of organizational structure which may emerge in university libraries in the future.