NEW SYSTEMS AND THEIR HUMAN DIMENSIONS
IN AN ACADEMIC LIBRARY (SYSTEMES NOUVEAUX
ET LEURS DIMENSIONS HUMAINES DANS UNE
BIBLIOTHEQUE UNIVERSITAIRE)

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ABSTRACT

This paper briefly describes systems currently operational
at the University of Calgary.   It then examines the impact
of these systems, services and technologies on both users
and librarians.   The paper is based on the experience of
the University of Calgary Library with automated and semi-
automated systems which also provides the basis for the
generalizations which the authors make.   (Ce mémoire est
une courte description des systèmes actuellement en marche
à l'Université de Calgary.   Il examine l'effet de ces
systèmes et ces technologies sur le public aussi bien que
sur les bibliothécaires.   L'étude repose sur l'expérience
qu'a eue la bibliothèque de l'Université de Calgary de
systèmes automatisés en tout ou en partie, expérience qui
sert de base aussi aux généralisations formées par les
auteurs.)

INTRODUCTION

Since 1971 The University of Calgary Library has introduced a number
of automated and semi-automated systems.   These systems are operational in
the areas of administration, acquisitions, cataloguing, collections develop-
ment, periodicals, circulation and information retrieval.   In addition,
the Library now has the capability of accessing some twelve million biblio-
graphic records on-line from outside suppliers.   The implementation of all
these systems has had a considerable impact on the Library organization as a
whole, evidenced by the new and different information activities undertaken
and contemplated, new user services, data bases and participation in national
and regional projects.   From among the several areas affected by these
changes, including costs, internal structures, and external relationships,
the authors have singled out the human element, namely, users and librarians,
to focus on, applying their experience gained at The University of Calgary
as well as their observation of trends traceable elsewhere.

SYSTEMS CURRENTLY OPERATIONAL AT THE UNIVERSITY OF CALGARY LIBRARY

There are six systems currently operational at The University of
Calgary.   These are the EXCON System, an accounting system; the TESA

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System, a shared acquisitions and cataloguing system; the computer-based Collections Policy; the Periodicals/Serials System; the Circulation System; and the Information Retrieval System.

The Accounting System

This system provides reports on the budget as established at the beginning of the financial year and monthly statements showing the status of the budget with the amounts spent and committed.   These reports are referred to as the EXCON Statement, an acronym which stands for EXpenditure CONtrol System.   The accounting system has three codes: a major code to identify whether the item is an expense or an asset; an intermediate code to designate the operating unit (for example, the Library); and a minor code to identify the type, expense or asset.   A memo code provides greater detail in the analysis of money expended and revenue received.   It is used to identify expenses for units within the Library: salary, accounts, office supplies and bindery, in addition to the book budget, by unit or division within the Library.   This system is part of the University Accounting Code System.

The TESA System

The TESA System was acquired from the University of Saskatoon.   The acronym stands for TEchnical Services Automation and the system supports the acquisition and cataloguing functions of the Library.   The mainstay of the system is the on-order and in-process file where the status changes of every order are recorded until the item is catalogued and the order paid. Machine readable data is then deleted from the in-process file and transferred to the Library holdings file.   This system produces multiple copy purchase orders, status change cards, and prints receiving reports of items. It also produces catalogue card sets, cataloguer's listings, accounting reports, claiming notices and other pertinent reports.

The Collections Policy

The University of Calgary Library developed a computer-based management information system in 1973 to assist in the rationalization of collections development for the Library.   This system was described in some detail in a paper presented by the authors at the Second Open Conference on Information Science held in Winnipeg in 1974 (Converse and Standera 1974).

The Periodicals/Serials System

This system is designed to control the 11,000 periodical and serials titles to which The University of Calgary currently subscribes.   Two files are maintained.   The first is a holding file which includes the title, holdings, location and call number.   The second file has the Purchase Order Number and the cost of the subscription.   The cost of the subscription

is updated from the Accounts Payable System at the end of each fiscal year and the EXCON System is then updated with the cost of the continuing subscriptions for the following year. The information from this system requires only a conversion program to transfer the information to the TESA in-process file.

The Circulation System

The automated circulation system was introduced in 1971 (Murch 1971). It is a batch system by means of which the transactions of one day are processed overnight and printouts of the transactions are made available to the users the next day. This enables the Library user to readily determine the status of a particular title by simply consulting the printouts available in the public areas. This system is designed as four sub-systems which interface to provide control over the circulation of books. The four sub-systems and their major functions are as follows: a) The Book-on-Loan Sub-system maintains a record of the books out on loan and is updated daily. It supplies various forms of output, including a daily books-on-loan report, recall notices and hold responses. It also prepares statistics. b) The Reader Identification Sub-system identifies the names, addresses and types of readers. c) The Accounting Sub-system maintains the records of fines and produces fines notices. d) The Book Identification Master file identifies all circulating materials. However, since only books circulate, it cannot provide information about periodicals which do not circulate and books used in the Library. A further limitation is that it is not on-line. Because this system was designed for circulation purposes, only a limited number of characters has been assigned for the title of books. The bibliographic information is too limited for this file to be used for enlarging the TESA file for acquisitions prior to 1974.

The Information Retrieval System

The University of Calgary Library's computerized information retrieval system is a batch system for both current awareness and retrospective searching. This in-house system is used to process COMPENDEX, ERIC, MARC, and CANADIAN MARC tapes. It is conveniently complemented by an indexing system. The Library also has access to four on-line systems, CAN-OLE, SDC, Lockheed and MEDLINE (Standera 1974). These comprise some forty data bases and represent potential access to some twelve million bibliographic records.

THE HUMAN DIMENSIONS

However fascinating or frightening these new systems may appear to different groups of users and librarians, the human dimensions are predominant in determining their final acceptance or rejection. For this reason, these systems must be carefully planned with the human element in mind. We shall now focus on the human dimensions of the new systems.

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Users

In examining the impact of new technologies and library systems on users, there are a few basics to be noted. The first of these is convenience. The potential user is more likely to adopt a new system if it increases convenience. The new system must satisfy the potential user by significantly decreasing the initial effort demanded. If the new system offers completeness and requires little effort to understand and operate, the advantage over competing manual systems will be overwhelming. However, if the system provides incomplete coverage and requires mastery by the user of a thick operating manual, resistance will be strong. This applies to both batch and on-line systems.

The second is that users themselves are generally not concerned about the production costs. The users want their needs met. So far as they are concerned the economic viability of a new system is a matter for administrators and budget officers and merely reflects the priorities set by the institution. The users will become concerned about costs only when a fee for service is introduced.

The third is that users are indifferent to procedures. It is immaterial to them whether the new system is manual or automated or semi-automated. For a new service to be accepted it must be advantageous for the users. The important attribute of any new system must be its user-orientation which should be incorporated in it at the design stage and maintained throughout its operation. It has been established at Birmingham University (Roth 1974) that from among unsuccessful seekers of information 65% of the undergraduate students and 58% of graduate students did not consult catalogues, abstracting-indexing tools or library staff. If an automated computerized catalogue can provide convenient access to library holdings, it will be welcomed as an improvement. If, on the other hand, it provides users with incomplete information and involves a cumbersome procedure, no-one is likely to be impressed by the mere fact that the technology itself is more sophisticated.

The fourth is that users tend to stick to their information gathering patterns. These user patterns were formed in college and high school. To change these deeply ingrained habits the potential users of a new system must perceive that the new system is clearly superior to the old and must be suitably motivated to change. Users will continue to do their searches manually until they are convinced that a computerized search saves them time, ensures completeness, timeliness and offers printed cards for their files. The savings are perceived more often in terms of time and effort than money actually expended or saved.

The fifth is that users are very sensitive to any fees whatsoever. If there is a fee for service and a comparable service is available free, then the choice is obvious for most users even if the service being charged for is superior, more economical and, therefore, more desirable

in the long run.   A new service may first be offered on a free trial
basis.   Then, as the users come to rely on the system, payment for service
becomes increasingly a matter of ability rather than willingness.   The
authors believe that a fee for service provides a real measure of effective-
ness by identifying the kinds of services users really want in terms of
what they are prepared to pay for, rather than continuing to give them a
variety of services they may or may not require and for which they do not
have to pay.

In general, so far as users are concerned, there are several clear
trends to be observed and anticipated due to the introduction of new tech-
nologies and systems in library and information services.   The competition
in supplying information products will appear in a new light after more
on-line services are available from different suppliers and different net-
works.   In order for a user (either the ultimate user or his "information
broker") to take advantage of this market, it is first necessary to know
what the alternatives are.   Access via telecommunications will enable
more users from remote areas to utilize files and holdings.   More than
one user will be able to consult the same file "concurrently" in the time-
sharing mode in the discrete "slices" of time.   New sectors of population
may be able to benefit from certain services, such as telephone enquiries
to computerized files.   However, this does not apply to all new tech-
nologies, and without promotion, "old" users may simply patronize "new"
services.

Librarians

What impact will all these changes have for library personnel?   It
may be safely assumed that the configuration of the library profession will
continue to change.   Libraries now employ professionals with diversified
backgrounds.   These include systems managers, systems analysts and
designers, programmers, information scientists, operation research
specialists, data controllers, key punch operators, terminal operators,
and media specialists.   The ratio of these new professionals to the
traditional librarians is still low.   However, this ratio will change.
Some of the "new-comers" are employed on a professional basis while others
(operators) are employed in the support staff category.   Both may be
employed on either a permanent or a temporary basis.   A new profession of
a library and information consultant has also emerged.

The introduction of these new professionals may at first be viewed
in somewhat negative terms: "They are not librarians".   Not until the
new systems take hold and begin to change the way things have been done
traditionally is the impact felt.   Then the new professionals will have
to be reckoned with and there is always the danger that having been
viewed from the first in somewhat negative terms, they will now come to
be viewed as a positive threat to the status quo.

The situation is further complicated by the fact that as our

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society approaches a post-industrial stage work becomes information
and knowledge work, and the workers become information and knowledge
workers. The role of the librarian and bibliographer begins to merge with
that of the new information professionals.   The need for integration and
the recognition of common objectives and goals is of paramount importance
if the outcome is going to be socially useful and productive.   This calls
for a re-evaluation of goals and objectives as the new technology is intro-
duced.   Users are now becoming rapidly aware of the fact that there are
new and faster ways of getting information.   The mass media, if anything,
have tended to headline the new information technology and to exaggerate
the performance of these new systems.   The effect is one of heightened
expectations on the part of potential users.   The librarian in an academic
library is now in the somewhat invidious position of having to measure up
to these new expectations of performance while also continuing to work
with conventional systems.

Most of the schools of library and information science in Canada
and the United States are now paying serious attention to the new systems
and technology and the new graduates are better equipped to cope with the
fresh problems and challenges they present.   The era has passed when it
was thought that every librarian would have to be retrained as a programmer.
Librarians are required to read computer printouts and understand the basics
of information dissemination, also how to prepare inputs (e.g., profile
coding, catalogue production), and they now use terminals regularly in much
the same way as they have always used manual files.   Retraining is an
item in library budgets and seminars and workshops are held to familiarize
traditional librarians with the new techniques and to equip them with
such basic skills as search editing.

Negative attitudes persist however.   Among these are inertia,
resistance to change, fear of computers and uncertainty about identity
and job.   These can be overcome if librarians are actively involved in
setting new objectives and establishing new systems.   Fear of computers
may be reduced by exposure to and interaction with them.   Computers do
not so much destroy jobs as transform them and, as a result, change roles
and functions.   The new challenges and opportunities they provide call
for openness to change and the ability to adapt to new ways of doing things.
Examples of successful adaptation within academic libraries may be seen in
the case of reference librarians and bibliographers relying increasingly
on IR to produce specialized bibliographies by accessing a number of
computerized data bases.   The time gained in not having to perform these
searches manually by consulting a large number of reference works is time
that can now be spent with users performing additional searches.   The
result is an increase in the number of users served and a reduction in
the unit cost.   Similarly, whereas reference librarians in the past
have assisted users in consulting the card catalogue, reference librarians
in the future will be able to help users access a computer-based catalogue
either by operating the terminal themselves or by teaching users to operate
the terminal.   This should result in more users being served and in a

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further reduction of unit cost. Yet it would be misleading to suggest that the transition from manual to automated systems will always be so smooth. Situations will certainly arise in which the user who has just succeeded in retrieving a highly pertinent citation from one of the data bases accessed will then be unable to retrieve the document from the library. On-line ordering may alleviate this situation somewhat. Then there will be the user who discovers that a search which can be conducted on-line in a matter of seconds has to be delayed by a day because the operator is not available, there is a backlog of requests, the system or computer is down, the file is not available or there are communication difficulties, the channels or ports are busy, the network is overloaded and the telephone lines are engaged. Such delays are extremely frustrating because the scale of expectations has changed with the advent of computerize(systems. Automation of academic libraries proceeds slowly and unevenly. Automated, semi-automated and manual systems continue to operate alongside each other until the manual system is phased out. As the library organization adapts to these changes, the impact of the new systems and technology is gradually absorbed and diffused throughout the organization. Academic libraries find themselves assuming the new roles and functions that are being created for them.

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