

discussion, a lively three-hour meeting produced many ideas for the future development of the retrieval system.

Each month the Institute mails experimental KWIC cumulative indexes to *Textile Technology Digest* to interested representatives. Two members of the Chemstrand Technical Information staff review these indexes regularly, check their effectiveness in uncovering items of interest in *Textile Technology Digest*, and spot-check the thesaurus for accuracy and logic. The feedback of comments from Chemstrand and from other industry representatives furthers the development of the system. Eventually it should be possible for the Institute to perform mechanical searches in the textile-processing field.

Another cooperative effort was made with the North Carolina Science and Technology Research Center, located in the Research Triangle Park. This information center specializes, at present, in NASA information. Since there is some overlapping in subject coverage (high temperature polymers and textiles), this information center is also of interest to Chemstrand.

As an interested user, the literature chemist was able to make direct comments on the relevance of the items found which allowed them to experiment with alternate methods of computer programming and to improve the selectivity process. The joint efforts resulted in benefits to both organizations.

SUMMARY

To make his job in industry more effective, it is suggested that the literature scientist become involved in the development of at least three areas of activity; his own conventional techniques of information transfer, his company's own retrieval system, and the retrieval system of outside information centers which process information of interest to his own company.

REFERENCES

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AN INDUSTRIAL LIBRARIAN LOOKS AT AUTOMATION

By

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A short history of American Enka Corporation is necessary to understand the problem of retrieving technical material requested by the various units of the company.

American Enka Corporation is a subsidiary of Algemene Kunstzijde Unie (AKU), a Dutch textile combine which also has affiliates in Germany, Mexico, Ireland, Italy, and Spain as well as several plants in Holland. In 1929, AKU purchased a tract of land in the vicinity of Asheville, North Carolina, and established American Enka to manufacture rayon. The company prospered, particularly during the war years when tire yarn was in short supply. In 1948, on a site in Lowland, Tennessee, about 40 miles northeast of Knox-

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ville, a plant to manufacture rayon filament yarn went on stream. A rayon staple fiber plant was added at Lowland in 1957.

In step with the times, American Enka entered the nylon field, first with semi-commercial quantities made at Enka, then with the expansion of these facilities, plus additional facilities at Lowland. Company progress has been accelerated by invaluable technical data and assistance from both Holland and Germany, where extensive research has been devoted to nylon and other man-made fibers. In recent years, the manufacture of another fiber, polyester, has been undertaken, at both the Enka site and at Lowland, and expansion of manufacturing facilities is presently under way.

This constant expansion provides many opportunities for the technical personnel. They depend on the library for the latest technical information — information they must have to provide the leadership so vital to company progress. What is now the Business and Technical Library was established in 1951, with a chemist as librarian, and a secretary. Book and periodical purchasing was centralized for the company, and magazine circulation was handled here.

In 1956 the library became a repository for technical reports. These were scattered throughout the company. The rayon chief chemist received most of the literature from overseas and his files were transferred to the library. The files of the Enka director of research were also transferred to the library and memoranda were sent department heads requesting unique reports and the addition of the library to the circulation list for future material. An assistant librarian was hired with responsibility for cataloging and indexing. The classed catalogs were combined to make one dictionary catalog to cover the three types of materials received: books, reports, and vertical file material such as pamphlets, photostats, and reprints. It took four years to get this material organized into usable form, filling forty standard file cabinet drawers. When the job was about finished, a slump in the textile market resulted in elimination of the positions of assistant librarian and secretary. Some library services had to be curtailed, others abrogated, and others farmed out to various departmental secretaries.

With the growth of the company, and the increasing amount of technology coming from overseas in the form of report literature, some means of making indexes available at other company locations was indicated. Tennessee personnel could not come in to consult the card catalog; the librarian did not have the time to answer numerous telephone inquiries and conduct searches. Various means of reproducing the dictionary card catalog were considered. Lithography would be expensive, and a printed, book-type catalog would be difficult to up-date. Typing the cards in the sixty-drawer catalog would be too time-consuming.

It was at this point that the Operations Research Department came to our rescue. They wished to extend the usefulness of the IBM hardware and had studied the IBM pamphlet,

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OF 2700 AND 5300 DENIER	LOFTED ESTRON AND PACKAGE DETAILS		SCOTTR-57-H6T
THIS BULKED YARN WITH	LOFTED ESTRON, SPUN RAYON, AND COTTO		SCOTTR-57-H6V
	LOGIC		FLESRF-51-015
INTRODUCTION TO SYMBOLIC	LOGIC #	AN I	LANGSK-53-U27
— PHILOSOPHY.	LOGIC, SYMBOLIC AND MATHEMATICAL.		STABER-53-25-
	LOGIC, SYMBOLIC AND MATHEMATICAL.		LANGSK-53-U2Z
LM CARRIER — BAUSCH AND	LOGIC, SYMBOLIC AND MATHEMATICAL.		FISHRA-56-006
PROBABILITIES.	LOMB SPECTRUM FILM PROJECTOR #	FI	JOLLEC-51-32U
STRENGTHS. 1. EFFECT OF	LONGER SECOND BATH IMMERSION ON		GODEDJ-57-50
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ERIMENTS TO DETERMINE	LONGITUDINAL FINISH UNIFORMITY. EXP		BREAFB-51-28
RY #	A LOOK AT GRACE IN THE CHEMICAL INDUST		-57-534

Figure 1 — Key Word Index

Data Processing Techniques, Keyword-in-Context (KWIC) Indexing. Preliminary cost studies showed this method to be relatively inexpensive, since the company already had the hardware, which could be used in off-hours. A summer employee was available who had studied data processing at Davidson College, and a keypunch operator could be obtained from Manpower, Inc.

A successful "dry run" was made of the first drawer of the catalog, which contained about 825 cards. Four cards were punched for each main-entry card: author, title, source, and abstract card. The result is a two-volume print-out. The first volume contains the KWIC Index (see Figure 1 below). This is an index in which the key words from each title or subject heading have been arranged alphabetically down the center of the column. Each line has room for approximately sixty characters, including the key word. As much of the title as can be printed in the available space is included, and the end of the title is indicated by the symbol #. The title is sometimes "wrapped" around the key word. At the end of each entry is a reference code, which provides access to the bibliographic reference found in the second volume. The code consists of the first four letters of the author's name, his two initials, the year the report was written, and a three digit sub-code. The sub-code is necessary to avoid having the machine discard successive reports by the same author as duplicates.

The first entry in Figure 1 shows the title wrapped around the key word "LOFT." The reference code is at the right, COBLL-56-V58. (The thirteenth line lacks the author part of the reference code, because corporate authors are not included.) As an example, if one wishes to locate from Figure 1, line 5, an introduction to symbolic logic, he would turn to volume 2, "LANGSK-53-U22," which is shown below as the second item in the left hand column.

The bibliographic volume gives the author, title, location of the material, and subject headings. At the right is the type of material and the year it was written. The first entry in Figure 2 is a report, written by R. Langendijk, entitled "Column Driers." It is filed in the library according to the issuing department, which in this case is AKU-TUBA. The last line gives the subject headings, which are also picked up in the index volume. The next item is a book on permanent loan to our Operations Research Department, and the last two are located in the library, with the call number given.

Several problems were encountered in making the index usable. The first problem was size. The dry run on the index of the first drawer yielded a document $\frac{3}{8}$ of an inch thick. Something the size of *Webster's Unabridged Dictionary* would be decidedly unwieldy. Upon examination of the entries, many could be eliminated, as they are meaning-

LANGR-59-U2X	LANGENDIJK R COLUMN DRIERS AKU - TUBA 119 - 6/10/69 REPT FILE POLYESTER CHIPS - DRYING. DRYING APPARATUS.	RE59
LANGSK-53-U22	LANGER SK AN INTRODUCTION TO SYMBOLIC LOGIC NEW YORK, RONALD PRESS, 1947, 1944 1953 LOANED TO OPERATIONS RESEARCH LOGIC, SYMBOLIC AND MATHEMATICAL.	BK47
LANGT-47-U2V	LANG T COST ACCOUNTANTS HANDBOOK NEW YORK, RONAL PRESS, 1947, 1944 657.4 L26	BK47
LANGWE-34-U3T	LANGLOIS WE SLOW VISCOUS FLOW NEW YORK, MACMILLAN, 1964. 532.5 L26 HYDRODYNAMICS VISCOSITY	BK34

Figure 2 — Bibliographic Index

less. Such words as "according," "acquired," "addresses," and "analyzed" must be programmed out. The list of words in the American Chemical Society's biweekly periodical *Chemical Titles* is not all-inclusive, and the individual library must do its own weeding. There were also some terms that were both meaningless and meaningful; e.g., "report." "Report Writing" is a subject heading that should appear, yet "Report of Trip," or "Report of Visit" gives no information. The solution here is better titling of research reports and the education of personnel as to what is required for this type of indexing.

Another problem was the tendency of the machine to discard additional reports written by the same author. This was solved by programming the computer to identify separate reports by adding a three digit sub-code.

As the problems were solved on the dry-run, and the project met with the approval of the research director, a keypunch was moved into the room next to the library, so that it would be close to the card catalog, and the librarian could be consulted on any entries. One drawer was removed from the catalog at a time, and each main entry card was coded and turned on end, punch cards were made, and the entry card reinserted in the drawer. Thus, there were no lost cards and no misfiling. The cards were proofed as the punching proceeded. The cards were sorted on the computer, taped, and four copies made from one print-out.

The last problem to be solved was the method used to present the index system to others in usable form. The machine print-out is a fan-fold continuous paper fifteen inches wide. The printed material occupied about eight inches horizontally. This fan-fold document was bound at the top in a hard-cover binder with nylon posts. However, in a month's trial use, pages were torn loose and the posts broke due to constant bending. It was decided that the index would be easier to use if it could be bound at the left margin. A "burster" was located in Asheville. This is a machine that rapidly tears the pages and collates them in book form. Then, hard-covered bookkeeping binders with two steel posts at the left side were procured. The sheets were stacked and much unused paper on the right and left margins was removed, holes bored for the posts, and the two-volume index assembled. Each volume is 12" x 11½" x 2½". It opens bookwise, and is printed on one side of the paper. The librarian explained the use of the KWIC to an assembled group at each location when the index was delivered, and there have been few problems.

The KWIC Index is updated annually. A complete revision took place in August, 1965. As material is cataloged in the library throughout the year, a copy of the main entry card is duplicated and sent to Operations Research Section to be coded and punched by company personnel. These cards can be done a few at a time. If the amount of incoming material creates a need for updating more often than once a year, supplements could be issued. However, as accession lists of all additions are issued monthly, a yearly rerun has been satisfactory.

The cost of instituting this system was about \$3,000. This sum includes the salaries of the keypunch operator, the summer student, rental of an IBM keypunch 026, and supplies. One-hundred-thousand IBM cards were used, plus five reels of magnetic tape, and 20 hours use of a 1401 IBM computer at \$18 an hour. To update the index, or should more copies be requested, four copies can be printed by one run of the computer at an estimated cost of \$146.

The index has been in use at three locations and in the library for almost two years. During this time use of library materials has substantially increased from our Lowland plants. The men are able to define what they want and request reports and books by

title, rather than asking to be sent "all you have on . . ." This saves the time of both patron and librarian. The KWIC Index offers the advantage of picking up unique names of finishes or yarns and other technical terms that would not have an entry in the card catalog. It is also a ready-made index to report literature field in a department and duplicated in the library, and tends to decrease the reports received directly by an individual and hoarded in his files.

The chief disadvantage to this index is that the key word tape skipped on occasion, and did not pick up all the reports on a subject. It is impractical to check the tape for omissions. In the 18 months of use, about four omissions have been found. Another disadvantage is the number of meaningless words that the computer picks up in the key word index. Some can be programmed out, but there will always be a few. A third disadvantage is that the language of the report is not given, and many of the reports are written in Dutch or German. This is being corrected, for as new material is added to the KWIC, any language other than English is noted.

American Enka Corporation has found these indexes to be of great value to the company. They are easy to use and their accessibility at various locations has encouraged the technical staff members to take advantage of the available technology in the company. The KWIC Indexes are consulted when a problem arises, and the solution can often be found in the literature generated within the AKU framework.

NORTH STATE NEWS BRIEFS

LIBRARY LEGISLATION TO BE DISCUSSED

"Federal Legislation for Libraries" will be the topic for the 13th annual Allerton Park Institute sponsored jointly by the University of Illinois Graduate School of Library Science and the Division of University Extension. The Institute, scheduled for November 6-9, 1966, will be held at Robert Allerton House, the University's conference center near Monticello, Illinois.

Federal partnership in financing library development, which began modestly with the Library Services Act in 1956, has now reached a level which promises to bring about profound changes in the quality of library service in this country. The purpose of this Institute is to provide an opportunity for a thorough examination, not only of current programs, but of the probable long range implications of present and proposed federal legislation on libraries of all types.

A detailed brochure listing topics and speakers and giving registration information will be available after June 1, 1966, from the Institute Supervisor, 116b Illini Hall, Champaign, Illinois 61822. Registration for the Institute will be limited to 90 persons.

SCHOOL LIBRARIANS PLAN CONFERENCE

The North Carolina Association of School Librarians, in cooperation with the State Department of Public Instruction, will sponsor a work conference on "Innovations in School Library Services" September 29-October 1, 1966. Speakers for the biennial conference will include Dr. Richard L. Darling, President-elect of the American Association of School Librarians and assistant director, Department of Instructional Materials, Montgomery County (Md.) Public Schools; Mrs. Alice Rusk, specialist in library services,