

IMPLEMENTING TECHLIB AT ROCKWELL INTERNATIONAL

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ABSTRACT

The Technical Information Centers (TICs) of the Rockwell International Corporation chose the BASIS Techlib system, produced by Information Dimensions, Inc., to automate their library processing. Techlib was modified to meet the Rockwell TICs' needs, including cataloging, classification, and call number differences among the TICs, handling bibliographic records and thesaurus files converted from an old automated system, and routing printed output at multiple sites. Techlib, renamed the Rockwell Technical Information System (RTIS), has been in use at Rockwell since April 1987.

How does one bring together Technical Information Centers (TICs) from Los Angeles to Dallas to Pittsburgh, specializing in subjects as diverse as aerospace, automotive products, avionics, commercial and defense electronics, and business information? Rockwell International's answer: Techlib, and a lot of cooperation.

Techlib, a set of BASIS program files (profiles) and reports, runs on the BASIS Central System. BASIS is an information management system produced by Information Dimensions, Inc. (IDI), a wholly owned subsidiary of Battelle Memorial Institute (formerly Battelle's Software Products Center). The Techlib

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profiles provide menu-driven search, input, circulation, acquisitions, and reporting functions, as well as the option to use the BASIS Central System outside of the menu structure. BASIS provides many building blocks for creating databases and applications, and it was possible to modify Techlib to Rockwell's requirements in a relatively short period of time and with a minimum of programming knowledge. The Rockwell Information Systems Center (ISC) provided excellent support for the system, including assistance in setting up the Techlib database in the mainframe environment (IBM, on the MVS TSO operating system), and in converting and loading thesaurus and bibliographic data from a previous library system into the database. Rockwell also relied on its IDI site representative, a Techlib staff member, for help in understanding and modifying Techlib.

Rockwell International Corporation has divisions in many states, as well as sites in several other countries, with products and services in aerospace, electronics, and automotive and general industries. There are TICs or technical libraries at 18 sites, whose function is to serve the engineering population and/or provide business research information. Several of these sites are located in the Los Angeles area; others are in the midwest, northeast, and southeast states. The number of staff in each TIC ranges from one to 15, and individual collections from 1,000 to 70,000 items. Some serve several physical locations within the same division.

The TICs operate fairly independently of one another; neither cataloging nor acquisition is centralized. This is not to say that the TICs do not work together. TICs in related divisions often standardize to some extent, and by the early 1980s several cooperative efforts were in place involving several or all TICs. All TICs participate in and contribute to a corporate-wide Union List of Periodicals (ULP). Interlibrary loans are facilitated by sending requests and replies over the CLASS OnTyme electronic mailing system.

From 1964 until Techlib was put into production, six TICs

automated cataloging input, searching, Selective Dissemination of Information (SDI), report production, and vocabulary and corporate source name thesauri using an in-house batch and online system running on the IBM mainframe. By 1987, this system held more than 200,000 bibliographic records. The thesauri contained approximately 20,000 subject terms and 9,000 corporate source names.

Acquiring a Shared Information Retrieval System

The Rockwell library community felt that a single integrated automated library system, which would provide corporate-wide access to all TICs' holdings, was desirable to supplement and eventually replace the variety of automated systems in use. A Technical Panel on Technical Information Services was formed in 1983, comprised of representatives from the TICs, to disseminate and exchange information among all TICs. Its first priority was to work toward a corporate-wide information retrieval system, and a Working Group was established to study available options.

System requirements set up the Working Group included:

- Integrated automated library system
- Menu driven
- Flexible indexing, free text search of title and abstract
- Boolean logic and search term truncation
- Operate on IBM mainframe
- Handle initial 1/2 million records, growth to 3 million
- Interactive or batch input, preferably both options
- Multiple users at decentralized locations
- Accept converted data from old system
- Update at least weekly
- Vendor to provide program maintenance and some modifications
- Flexible report formatting
- Cost accounting (track acquisitions, etc.)

- As little dependence as possible on system programmers
- Interact with PC, particularly for circulation processes

Systems studied were: the in-house shared catalog already used by six TICs; BASIS (Battelle/IDI); FOCUS (Information Builders); INQUIRE (Infodata); STAIRS (IBM); LS/2000 (OCLC); and private files on DIALOG, RLIN, or BRS. BASIS was the final choice, largely because of its Techlib application which integrates menu-driven cataloging, search, circulation, acquisitions, and report production. Only one of the other systems studied at that time, LS/2000, provided a turnkey integrated library system. LS/2000 was not capable of handling the record size and format that Rockwell required and did not run on the IBM mainframe. Although Techlib can be purchased as a stand-alone application the decision was made to acquire the entire BASIS package, so that BASIS would be available to other computing applications within the corporation. The Serials Tracking and Control System (STACS) application of BASIS was purchased along with Techlib.

The implementation of Techlib was accomplished by a group located at the Space Transportation Systems Division (STSD) in Downey, California. This group consists of a Program Administrator and three staff members (including the author). It is responsible for the maintenance and further development of the system, as well as providing documentation and training for TIC staff. An ISC Senior Systems Analyst was assigned half-time to the project and provided invaluable assistance in loading the BASIS modules, setting up test and production Job Control Language (JCL) and TSO command lists (clists), and converting data and thesauri from the old system. In addition, a programmer from a STSD systems group did some of the Techlib profile and report modification during the final phase of implementation.

Implementation Timetable

BASIS, with the Techlib and STACS applications, was

purchased in late 1985 and installed at Rockwell in January 1986. Two employees attended two BASIS training sessions each at the vendor's Columbus, Ohio headquarters. The Techlib Data Definition Language (DDL), a set of statements defining a BASIS database, was modified and compiled as RTIS, the Rockwell Technical Information System in May 1986. A small number of records were input, and four TICs beta tested RTIS during the fall of 1986.

Programs were written in-house to convert the more than 200,000 records in the old catalog shared by six TICs into a format that could be batch loaded into the RTIS database. Both thesaurus files were also converted. A full load of all three files was done in April 1987, when Techlib modifications were complete. During record conversion two records were created for each old record, to make the database compatible with Techlib's shared catalog. Therefore, the number of records in the initial RTIS database was over 436,000. On-site training at the TICs began in April, and was completed at most TICs by October 1987.

From Techlib to RTIS

Techlib was originally written for, and is generally used by, a single corporate library. The Rockwell application is much larger than is typical, not only in the number of records, but in the number of separate TICs that use the system. The TICs required a number of fields not present in Techlib at that time, as well as thesaurus control of subject terms and rather lengthy corporate source names. The greatest challenge was, and still remains, making RTIS useful to all Rockwell TICs.

The number of TICs involved has had a far-reach effect on the implementation of Techlib as RTIS. As has been mentioned, the Rockwell TICS, for the most part, operate independently of one another. Policies for circulation and acquisition differ, a wide variety of catalogs and printed lists for patrons exists, and

different cataloging and classification schemes are used. The six TICs participating in the old automated system used the same subject thesaurus, built on the Engineers' Joint Council Thesaurus, for many years. This was converted into BASIS format for use with RTIS. Other TICs use LCSH or Sears subject headings, which will have to be merged into the current thesaurus. Some TICs assign Dewey Decimal call numbers, others use Library of Congress call numbers. Some use standard catalog cards purchased from a cataloging utility, others do all original cataloging. Even the participants in the old system were not accustomed to truly shared cataloging, since each TIC owning a document would input an entirely separate record. Each division has its own policies for purchasing computer equipment: there is no central site where group purchases of the same hardware can be made. As a result, the number of different terminal or microcomputer configurations used to access RTIS is almost as great as the number of TICs involved. On-site training was slowed because of the travel time required. Even something as simple as providing phone assistance is complicated by the time differences across the country.

In looking back on the implementation period, it is clear that the non-system considerations, such as inter-TIC communication, longer lead time for modifications because of differing or conflicting needs, and physical separation of locations, took at least as much time as did actual system work. The need to make BASIS "at home" in the IBM/MVS environment, and converting data from one system to another, accounted for much of the time involved. Actual Techlib modifications were probably the least difficult of all the challenges faced. RTIS is, in a sense, unfinished; modification continues as users become more experienced and make requests for changes to meet their needs. Following is a discussion of some of the features of Techlib, and modifications that were felt necessary.

Record Types

Techlib provides eight record types: CAT (catalog), CIRC (circulation), BORR (borrower information), PO (purchase order), ACQ (acquisition), REQ (requestor), VEND (vendor information), and INV (invoice). Related record types are linked by control numbers. For example, a unique alphanumeric sequence for each item must be present in both CAT and CIRC records describing that item. General bibliographic data is stored in the CAT record, and information unique to a single copy in the CIRC record. The system links a CAT record with all associated CIRC records (i.e., records describing multiple copies, whether at one or several divisions) by matching the control fields from both record types. This potentially complex process is simplified by the use of profiles and reports, and a special BASIS command which uses field links defined specifically for the database.

Another example of connecting record types is found in the circulation process. When a document is checked out, its identifying number is input along with the borrower's identification number. The borrower ID is added to the item's CIRC record by a Techlib profile, creating a link between that item and the patron's BORR record, which contains data such as the borrower's name, address and phone number.

Fields

Techlib already included fields for the cataloging, circulation, and acquisitions processes, in the eight record types. Rockwell added more than 20 fields, many of them to the CAT record: a second subject field, abstract, input change date, and a division code to identify the holding TIC, and several fields for cataloging government or corporate reports: corporate source code, report numbers, security classification. The LC call number was moved from the CAT to the CIRC record, and fields for Dewey call number, input change date, secret document control number, and

division code were added to the CIRC record.

The decision to move the call number fields to the CIRC record was a difficult one. Leaving it in the CAT record would have simplified some report processes by making the call number immediately available with the rest of the bibliographic information. In Rockwell's situation multiple copies of the same document can have quite different call numbers, if held by different TICs. Therefore call number was considered to be local information to be included in the CIRC record.

A two-character code identifying the owning TIC is part of the unique value present in the control field linking CAT and CIRC records. A separate field containing only the two-character division code was added after the first test load of 50,000 items. It is common for a TIC to want to limit a search to its own holdings; without an indexed field with that specific information, this type of search is time-consuming in a large database. The division code field is also used in processing reports, such as overdue notices and new book lists, which are limited to a single TIC's holdings.

Profiles/Reports

The BASIS Menu Language (BML) used to write profiles, and a similar Report language, are high-level programming languages that are accessible to anyone who has some experience with computer programming. Most of Rockwell's profile and report modifications were made by staff with limited programming backgrounds. Standard Techlib provides a working model, a sound basis on which to build. Although Rockwell modified many of the profiles and reports that make up the Techlib system, the general outlines and menu structure of Techlib remain intact. The new fields were added to the various processes, help screens were changed, and report formats modified. To make reports useful to the many different TICs, programming statements were added that cause an appropriate heading to be printed, depending

on which TIC requests the report.

Using the Menu-Driven System

The Techlib/RTIS menus provide an interface between BASIS and the user for every library process: data input, search and retrieval, circulation, reports, acquisitions. Most TIC staff members are experienced searchers, and find searching at the BASIS Central System faster and more flexible than using the search menus. Other functions are done entirely through the menu interface.

Data Input

BASIS provides three input options: line editor (prompts fields by field), full screen editor, and batch. Batch input was most useful during the database load. For daily data entry, the TIC staff members use one of the two online input options. Both are easily modified, according to various input needs. Techlib provides an additional layer of control for the line editor through a set of profiles that controls not only which fields are entered but also prompts for related record types, automatically inputting data into linking control fields. This helps assure data integrity. After a record has been input it is checked by a validation process, which was modified to meet Rockwell's needs. Any record that does not pass validation can be corrected right away, or left in a HOLD file.

Update

Validated input is held in a Queue File, or transaction file, until an update is done. Although input and validation are interactive, update is a batch process, initiated online or through a batch job. Rockwell updates between 100 and 400 transactions (adds, updates or deletes) each workday; the process normally does not take more than 15 minutes.

Searching

The BASIS search commands would be recognizable by those using a commercial database. FIND searches indexed fields; SCAN does a sequential search of records in a previously defined document set. Document sets are numbered and set numbers can be combined in subsequent searches. Boolean AND, OR, ANDNOT are used. Any term can be truncated, beginning, middle, or end. The LOOK command is used to display a part of the index term with postings. BROWSE is used to access the thesaurus. DISPLAY and PRINT are used to output all or part of the fields in all or part of the records in a document set. A document set of all records in the queue file (update file) can be created and searched. If an old record is edited, the latest version from the queue file is displayed to the user requesting that record during the search process.

Printed Output

Reports can be used to format printed output in many ways. The PRINT command, used from the BASIS Central System, left-justifies field names and data in separate columns. Because RTIS runs on the MVS operating system, the program is executed through a TSO clist that allocates one or more print files and prompts the user to choose where the output is to be printed.

Acquisitions

Acquisitions processing is not currently in use at Rockwell. The obstacle is a familiar one: determining the needs of all the TICs, so that acquisitions processing can be modified to provide the greatest amount of assistance.

Starting With an Existing Database

Starting with a full database and thesaurus was beneficial in several ways. Much data input effort was avoided. Some changes to better handle the large number of records could be made right away, while RTIS was still in test, instead of having to accommodate such changes after years of operation. New users, whose data was not part of the old system, are able to add CIRC records identifying their own copies of an item to CAT records already in the database. But starting with an existing database does put some constraints on database design. Rockwell had to create fields to handle old data, and accept a certain amount of non-standard data input over the years, including duplicate records since the old system did not have shared cataloging. Fortunately, Techlib was flexible enough to allow for the existing data as well as the new fields the TICs required. The purchase of IDI's MARC conversion utility will make it possible to load MARC records available from a cataloging utility used by several TICs. The MARC record conversion and load will present some of the same hurdles as did the original database load, i.e., editing non-standard data, creating both CAT and CIRC records from a single bibliographic record, and possible duplicate records.

Training and Documentation

When Techlib was first purchased, Rockwell planned to hold several centrally located training classes, which the TICs could attend. During training for beta test, it became clear that on-site training was a better approach. All staff members would be trained using equipment and materials they used in their normal activities, and any equipment problems—nonstandard keyboard, wrong printer node—could be caught by a trainer who knew what to expect from the system. Since startup in April 1984, 14 sites have been trained in accessing RTIS, searching, and data input. STSD provided an RTIS reference manual and a

smaller Quick Reference Guide as documentation, and a "help line" for phone assistance.

Plans for the Future

The response to RTIS has been excellent. Since startup, records describing over 8000 items have been added. Searching the RTIS database is becoming routine. In November 1987, for example, system use statistics show that there was an average of 58 RTIS sessions, and over 600 searches, daily. Some thoughtful requests for improvement have been made and implemented. Patron access (read-only) is now available through the local TICs. The number of options for routing printed output has been increased at many sites. Plans for the coming year include the conversion and loading of TIC holdings available on tape in MARC record format, development of reports to produce title, author, report number, and subject indexes on microfiche, printed book shelflist reports, and SDI processing. Tasks planned for the future include implementation of acquisitions processing, serials processing using the STACS module, and shelflist card production. Much time and effort went into the implementation of Techlib as RTIS at the many Rockwell TICs. The plan for a corporate-wide shared catalog and automated library system has been realized, a result of inter-library cooperation and a means for further cooperation.

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