"NOTICE: Contents of this package may prove hazardous to your eyesight. It requires delicate and expensive reading equipment. Do not use without professional advice."

Learn to live with it until something better comes along. Microfiche is not the ultimate system, but I have no doubts that it can be made to work, given sufficient time, money, and goodwill. The chief problem with microfiche is that unlike, say, 16-mm cartridge microfilm for manufacturers' catalogs, sold as a package complete with filing system and reader, microfiche is not a system. It is a more or less random aggregation of loosely standardized but essentially uncontrolled components.

Microfiche production has to take what it gets—anything from European documents hectographed in pale purple ink on foolscap paper to journal reprints with 6 point footnotes and spidery subscripts and superscripts. It must photograph it on a production basis, say at the rate of 1000 documents a week. The fiche they turn out then pass through a variety of hands more or less used to handling photographic surfaces, perhaps going through several generations of duplication. Eventually, they are read on a random assortment of readers in an even more random assortment of states of repair and cleanliness.

I contend that every step in the process is critical, in the sense that if one step breaks down the whole system collapses. If the system can not be made to work at 18 to 1 reduction, it bodes ill for future systems which prate of even greater reductions. The answer must be unremitting quality control, not just in photography, but at every step in the process, from preparation of the original material to be photographed to the final viewing.

And quality control of the original manuscript is one place where members of the Division of Chemical Literature can make positive personal contributions. If you know that a manuscript is to be reproduced and distributed on microfiche, design and lay out the final reproduction copy to be read as microfiche. I offer the following suggestions:

No sideways layouts—design all pages to be read vertically.

No fold-outs. If fold-outs *must* be used, each page should have its own legends.

All tables should be next to the pages in the text referring to them, even if it may be necessary to repeat a table. Conventional paper economics need not apply to fiche.

Figures and tables should appear as close to the place in the text where they are discussed as is possible. Don't relegate them to the appendix, even though it is easier on you.

Reference to figure or table numbers should be accompanied by a frame (or page) designation as well, if these are not on adjacent pages.

If the final fiche which the consumer receives is to be a negative, all artwork and photographs in the original master copy should also be negative, so that the direct viewer will see them as positives. But if printouts are anticipated, perhaps duplicate positives should be included.

BIBLIOGRAPHIC NOTE

This paper is a condensation of the preface and first chapter of my monograph of the same title, AFOSR-69-1847TR.[2] The remainder of the report is composed of excerpts from my correspondents, most of whose prose I prefer to my own, organized into the following chapters: (Microfiche and) Department of Defense libraries; Impact of DDC user charges; (Microfiche and) Government libraries; Industrial libraries; University and nonprofit libraries; Individuals and microfiche: (A) The enthusiasts, (B) The reluctant converts, (C) The agonistics; Fiche quality and format; Microfiche readers and reader-printers.

LITERATURE CITED

(1) Wooster, H., "Towards a Uniform Federal Report Numbering System and a Cuddly Microfiche Reader—Two Modest Proposals," **AD-669204**, Clearinghouse for Federal Scientific and Technical Information, Springfield, Va. 22151. Revised September 1968.

(2) Wooster, H., "Microfiche 1969—A User Survey," **AD-695-049**, Clearinghouse for Federal Scientific and Technical Information, Springfield, Va. 22151. 1969. 205 pages.

Microfilmed Catalog Services*

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For a number of years the library of the Bell Telephone Laboratories at Whippany, N. J., has provided a collection of suppliers catalogs to its users. By 1961 this had grown to about 2000 volumes, and was becoming increasingly difficult to maintain and update. Users of the collection were frustrated daily by having to use out-of-date or incomplete catalogs. We were tempted at that time to reduce the size of the collection to the point where the

available staff could handle its maintenance, but we felt that this would be a disservice to library users.

About this time, the first microfilmed commercial file of catalogs, VSMF, was introduced to the market. On the surface, VSMF seemed to be the answer to our suppliers-catalog problems, although we fully understood that VSMF would never completely solve all of them. We realized that although microfilm is a good substitute for the original copy, most readers would rather look at hard copy when given a choice. We also knew that

At the Bell Telephone Laboratories, maintaining and housing a 2000-volume collection
of trade catalogs was approaching a manpower and space crisis. The installation
of a commercial microfilm service for trade catalogs immediately relieved this situation.
A 16-mm cartridge-loaded format was the medium selected. Through the use of a
cartridge-based microfilm reader-printer, the user can view the image and quickly make
a print for retention. Initial use was low. However, a publicity campaign throughout
the laboratories has increased usage to the point where a second machine has been
purchased. Records indicate that users are from all employee levels, from directors
to draftsmen. This system has provided the technical population with a trade-catalog
system that contains recent data, a subject index, file integrity, and the ability to make
an on-the-spot copy. None of the competing systems are without faults, including
this one. Each one should be looked at closely to determine its merits and how it may
solve a particular problem. Experience indicates that individual needs at a given
location will dictate the system or systems that should be purchased.

the filmed catalogs might be out of date, and that the company searched for might not always be included. Nevertheless, the advantages seemed to outweigh the disadvantages.

Having decided to use a microfilmed trade-catalog service, we next had to determine which of the types of services offered by VSMF would be best suited to the needs of our users.

Because of the extent of the design work at Whippany, we decided the so-called Defense File—now called the Design Engineering File—came closest to matching our requirements. This file covered the defense-industries suppliers, particularly those servicing R&D installations. Furthermore, this file was arranged so as to allow side-by-side product comparisons, a feature particularly useful to an engineer. The other file available was the OEM (Original Equipment Manufacturers) File, but this was aimed more at heavy industry.

In the Design Engineering File, the manufacturer's name is of secondary importance, and the type of component or piece of equipment is the key to the way the material is arranged and retrieved. To create this file, the manufacturers' catalogs are torn apart, and pages describing like items from various catalogs are arranged in alphabetical order by the manufacturer. The material is then filmed on 8-mm or 16-mm film and packaged into cartridges, which are supplied to the subscriber. Like items from different suppliers are now located in one cartridge. Moving the microfilm back and forth enables the searcher to make easy visual comparisons among similar components that are made by many different companies.

In a design environment, subtle differences between individual parts can be of major importance. The designer is concerned with locating the best part he can find for his particular application. In many cases, he is unfamiliar with all of the possible equipment sources and does not take full advantage of the existing hardware. We felt that this side-by-side format would provide great versatility. Another selling point was the cartridge format with the automatic threading feature, which we thought would tend to counteract the users' normally poor regard for microfilm. We also thought that the reader-printer's rapid-print feature would be liked by the user. Our order for the VSMF Design Engineering File was placed later in the year.

Shortly after the system was installed, we were able to discard 1000 hard-copy catalogs that were duplicated by the microfilm files. This not only released valuable shelf space, but also reduced the chore of revision and updating. In a more-recent purge, 450 additional hard-copy catalogs were discarded, leaving only those that are used very heavily, are not in the system, or contain reference data that is not likely to be filmed. New catalogs are added only if they are in great demand or are not in the system.

After the system was installed, notices were displayed in the library and were sent to those groups which were known to be regular users of the collection. Despite this campaign, initial use seemed low. We had provided log sheets on which the user was to record the product or company for which he had been searching. There was also a place for him to indicate whether his search was successful. Log sheets were religiously filled out by the users, or so we thought. According to these log sheets, users were only making an average of 2.3 searches per day. Since this figure seemed low, we conducted some informal surveys which resulted in a new estimate of at least 7 searches per day.

In the summer of 1964, an electrically operated counter/timer was used to record the number of times that a film cartridge was inserted into the microfilm reader-printer and how many minutes this was in use. This device showed us that not only were the log sheets a poor indicator of use, but also that our own estimates were quite low. Instead of 7 searches per day, we were getting more like 11 or 12 searches per day.

In 1968, when another counter/timer test was made, the number of searches was up slightly, to 12.2 per day, with each search taking an average of 6.02 minutes. Based on these figures, the average cost per VSMF search came to $1.63. Assuming that successful searches run in the 70-80% range, we felt that the system was justified on an economical basis.

In May 1969, the counter/timer showed 20 searches per day, with an average of 6.3 minutes for each search. This brings the cost per search down to $0.99. More companies are being added to the VSMF Design Engineering File and more of our people are finding out about the service. This may account for the 65% increase in use.

All is not milk and honey, of course. There is still a time lag between publication of a new catalog and its introduction into the Design Engineering File, and an even greater time lag between a user's request that

a catalog be added and its actual appearance. Another weakness is that catalog pages containing reference on nonproduct information are not filmed. Where these are important, we keep a hard copy of the catalog.

Another obvious criticism of the Design Engineering File is that you cannot look through a complete catalog without going to all of the cartridge locations that contain the products made by that company. Even then, you can never be certain that all the pages have been filmed; as mentioned, pages that do not contain product information are not filmed. We feel, that most of our users are more interested in a particular kind of part than they are in reading a biography of the Acme Co.'s president, or in looking at a picture of its home office.

Any information system is only as effective as its retrieval capabilities. This is even more important when there is almost a random arrangement of information. As mentioned, a manufacturer with a diverse product line will have pages from his catalog in many different cartridges. If this system has any aspect that is outstanding, therefore, it is the index. Through it, the user can enter the system either under the name of a company, to determine which of its products are listed, or under a particular product, to discover the companies that make it. In either case, the user is provided with cartridge numbers and film-location numbers that enable him to find the proper frames.

Although the index is well prepared, it has been cumbersome to use. The initial system had the user looking up the desired item in one index, then going to a conversion index which gave the cartridge number and frame location. If the user was comparing products from several manufacturers, he had to refer back to the conversion index to find the new frame number for the next manufacturer.

VSMF has attempted to mitigate this problem by eliminating the index books and substituting a filmed index in 8-mm format with its own separate reader. The user can now view the index image on the small "Satellite" reader while he concurrently uses the main microfilm reader-printer to read the product file and to make his copies. A 16-mm version of the index is also provided.

In addition to the above-mentioned index, VSMF is offering the Design Engineering File in 8-mm format. The 8-mm format is actually two rows of 8-mm images on 16-mm film housed in a cassette and enlarged on a screen to 8 × 10½ inches through the VSMF Satellite reader. VSMF suggests scattering several of the Satellite units around the company and using the 16-mm film installation to furnish copies from its reader-printer.

The price for the 8-mm version is less than half that for the 16-mm format, but the user cannot make copies and is forced to use an inferior reader. This is operated manually by turning a small knob wheel on the side. The focusing mechanism is full of backlash, and images are often in focus at the top of the page while out of focus at the bottom. It is virtually impossible for more than one person to view the image simultaneously. The uninsulated bulb housing gets hot enough to burn the unwary user.

Over-all, Design Engineering File is providing users with more suppliers-catalog information than was available before its installation. It is also more current, has subject accessibility, and maintains better file integrity.

You have heard the experiences of one library with the VSMF Design Engineering File. I will now briefly describe another form of microfilm catalog system. This study was made as a joint Bell Telephone Laboratories–Western Electric Co. venture in our Columbus, Ohio, laboratory. VSMF also markets a microfilmed catalog service which is different from the Design Engineering File in important respects. It is called the Documentation File and is offered on both 16-mm and 8-mm film. In this file, complete manufacturers' catalogs are filmed from beginning to end, and each catalog is contained in one place on a film reel. The printed subject index is used to locate the names of the companies that make a desired component, and this leads the user to the cartridges housing these companies' catalogs. The system is updated every two months by replacing old cartridges with new.

The VSMF updating scheme involves some fragmentation—i.e., only the new catalog pages issued by a supplier are filmed when the manufacturer updates his catalog. As a result, the VSMF contains little duplication, but the product information for a given manufacturer may be scattered through several cartridges. VSMF still refers to the historical information in its new index, but it dates the listings. VSMF does not date the microfilm frames or identify the cartridge number on the frame.

With each file update VSMF supplies a single vendor/product index. The index tends to be confusing, since some of the individual manufacturers' indexes have been removed from their microfilmed catalogs and are replaced by a VSMF prepared index in the vendor list.

For example, the Acme Electric Co. might have a catalog covering different product lines. If the catalog is a long one, and you are interested only in a.c. motors, you would save a great deal of searching time by having the frame number for a.c. motors instead of the beginning frame number for Acme's catalog.

Several steps are involved. The first step is to find the cartridge and frame number on which the vendor's catalog begins. This is provided in the alphabetical vendor list. The second step is to find the frame number at which the desired component may be found. Under Acme Electric Co. you will find a secondary listing of the products in the catalog and a frame number for these products. In the subject portion of the index the reverse is true. Under A.C. Motors, for instance, you will find the companies that make them—e.g., Acme Electric and the proper frame number with the Acme Catalog.

Once the catalog number has been determined, the exact frame number on the film is found by using an optical coding system consisting of black lines which "move" on the running film and are lined up with a scale mounted on the side of the viewer.

Another system that should be considered along with the VSMF Documentation File is a newcomer to the field called AIM System II (Automated Information Management), a service of Specialized Business Services, Inc. (SBS). This system also films the manufacturers' catalog in its entirety, but it has some features that the others do not have.

One such feature is the Libraphone, a leased-line handset mounted on the side of the reader-printer that allows direct communication with the SBS sales office. If a user finds that the catalog for which he is searching is not

in the system, he can push a button and state his need to a clerk in the SBS office. Not only will SBS order a copy of the catalog for the requester, it will also order a copy for filming.

Another difference in the AIM file is the method used to locate a specific frame on the film. As mentioned, VSMF uses optical coding that matches a line on the film to a scale on the reader. AIM uses an odometer reading to find a desired frame.

Another system that should be mentioned is the Showcase Corp.'s Architectural File. The Showcase file contains catalog information from over 3800 manufacturers of building products and has been on the market since October 1967. It also provides descriptive information from 100 national associations that are allied with the building trades. An interesting feature of this company-oriented file is its tradename index. Showcase supplies updated material in 16-mm cartridges every 90 days.

A few words should be said about two other systems that were recently discontinued. From 1967 to 1970 the Sweets Vendor Catalog File provided direct competition to the VSMF Documentation File. Sweets is part of the F. W. Dodge Co., which is in turn a division of McGraw-Hill. The Sweets file was an excellent file, but McGraw-Hill discontinued it in January 1970. The Thomas Micro-Catalog was in its 7th year and differed from those previously mentioned in that it used microfiche instead of roll film in cartridges. It had over 1200 manufacturers' catalogs in its Basic File and more than 4000 in its Library File. A subscriber could order the Basic File and get a broad-brush, nonselective coverage of product information, or he could order the Library File and structure it to his needs by selecting only those catalogs that were pertinent. VSMF offers supplementary services such as filmed files of Military Specifications, Military Standards, and transistor and semiconductor information. Some of these additional options could be quite valuable to the user. Most are priced separately.

It is difficult, if not impossible, to say that any one system is superior. They each have advantages and disadvantages that have to be understood before an intelligent selection can be made.

Preparation of a Microfilm File of Company Technical Reports*

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At Esso Research and Engineering Co., worldwide sets of technical reports from company divisions and affiliates are periodically microfilmed on 16-mm rolls, in the proper order to permit use in cassettes in company report centers having cassette-type microfilm reader-printers. This format is the latest in a 50-year progression through 35-mm roll microfilm, micro-opaques, and microfiche; reasons for each change are discussed. In-house microfilming is described, with emphasis on procedures that yield a film capable of producing good photoprints. A cost comparison shows that report-file duplication on microfilm is more economical than hard-copy office storage, or even report storage in an off-site archive.

All technical reports that are written on petroleum refining, chemicals, and related subjects by members of the Standard Oil Co. (New Jersey) family are regularly received by Esso Research and Engineering Co.'s Central Reports Room, at Linden, N. J. These reports have been coded at source under Jersey's long-established international system for reports numbering, and they are logged accordingly on arrival. Technical Reports Indexes are then computer-prepared; these consist of a key-word-in-context (KWIC) subject index (to multiple sentences/report), a number-title list of reports, and an author index. The index is published monthly as a current-awareness tool, and semiannual compilations are issued as permanent tools for manual searching. The number-title list in these cumulations then sets the order in which a microfilm file is produced. The cumulated indexes and the corresponding microfilm form the basis for our present information-retrieval system for company technical