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Microfiche 1969—A User Survey*

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Received September 17, 1969

An informal survey of microfiche users was conducted by correspondence with individual users and librarians, resulting in over 300 letters. Industrial libraries led all others in their acceptance of fiche, with a ratio of 2 to 1 in favor. Half of the individual users despised fiche; 25% liked it with some reservations, and 25% were strongly in favor. Half of those who liked fiche had found it useful in handling personal reprint collections, primarily because it saved storage space, but also because it was easy to retrieve and manipulate, and inexpensive. The chief reason for disliking fiche was the unavailability of readers, either on the job or at home; a close second was the poor optical and mechanical quality of the readers currently available. The author offers three alternative strategies for dealing with microfiche: (A) Ignore it and it will go away; (B) Drive it underground, and (C) Learn to live with it until something better comes along. In pursuit of (C), practical suggestions are offered for format of reports to be reproduced on microfiche.

> "The good and bad points of microfilm, microcards, and microfiche are too familiar to require extensive discussion here."
>
> SATCOM Report, June 1969

I am not now, nor have I ever pretended to be, an expert on microfiche. Nevertheless, when I was invited to address the Third Annual Northeastern DDC/Industry Users Conference in Waltham, Mass., in April of 1968, I had the temerity to attempt to describe what I as a user would like to have in a microfiche reader.[1]

My proposed design has been greeted with enthusiasm by users and with massive apathy by manufacturers. It has had two real effects: 1. The adjective "cuddly" has almost become a term of the art. 2. I was asked by Col. Andrew A. Aines, USA (Ret), Chairman of COSATI, the Committee on Scientific and Technical Information of the Federal Council for Science and Technology, in a letter dated 6 June 1968, to "head a small two- or three-month effort . . . to come up with an appraisal (of user acceptance of microfiche) and recommendations for action, if warranted."

A very proper study would have determined as a necessary first step what percentage of the user population had been exposed to microfiche and only then gone on to find out what those who had been exposed thought

*Presented before the Division of Chemical Literature, Microfilm Forum, 158th Meeting, ACS, New York, September 10, 1969.

of it. My time and uncommitted resources—a GS-2 summer hire who was an unexpectedly good typist—did not permit determining this parameter; I thought I might be excused for skipping the first step and concentrating on the second.

For any sort of statistical validity, I had to reach as many people as I could with the resources I had at my disposal—the aforementioned GS-2, and access to a Multilith and a supply of franked envelopes. This meant letters. It also meant that every letter I sent out had to do at least double duty. I needed to reach people who not only had opinions of their own about microfiche, but who could also speak authoritatively about the opinions of one or more others as well.

The one person in any given scientific organization who best knows about the reading habits of its scientists and engineers is the librarian. So, I wrote letters to librarians.

First of all, 120 letters to members of the Military Librarians Association, since these were the people who had most recently, through DDC's imposition of user charges, been forced to learn about microfiche.

Many, if not all, of the librarians in research and engineering establishments tend to be members of the Special Libraries Association. I went through the SLA membership list and wrote to 175 who showed interesting academic or industrial affiliations.

Altogether, I mailed out 327 letters to librarians. I did not check the mailing lists for duplications, either of individuals or of organizations. In one case I know, I managed to send letters to six individuals connected with the same library! In spite of this duplication, I received 170 replies, slightly better than 50%. These were good thoughtful replies, running up to 2 to 3 single-spaced pages. And I'm afraid that some of them hinted wistfully that it was nice to know that there was someone in Washington who cared.

All this, though, without giving a single scientist or engineer an opportunity to express his opinion. Again I sought leverage by adopting a device old in scholarship but apparently untried in user studies—the Letter to the Editor. My letters were printed in the following journals: *Applied Optics, Chemical Week, Communications of the ACM, Datamation, Data Systems, DDC Digest, Information Usage Newsletter* (U. of Leicester, England), *Research/Development, Science and Technology, Space/Aeronautics, STWP/NY Chapter Notes,* and *USAF Stinfo Newsletter.* I received over 136 letters from individuals in response to these "Letters to the Editor."

I now had over 300 information-bearing letters, plus perhaps another 50 from free-loaders ("I don't know from nothing about microfiche, but please send me a copy of the report you promised to send to anyone who answered your letter.")

What to do with them?

My first step was to establish the following *ad hoc* categories:

Libraries. I have used the term to embrace both libraries and "information centers." Letters were put into this class if they were signed by an individual operating an information activity. A number of these letters discussed reactions of users other than the author. These latter comments were included among the user portions of the text.

Individuals. These were people who signed letters giving their own reactions to microfiche.

For. I have reserved the use of this term for those letters which gave an unequivocal endorsement of the use of fiche. This term will be applied only to letters from individuals. I found no library letters which regarded fiche as an unalloyed blessing.

For, with Reservations. This is the most subjective of my categories. It could equally well have had a twin, "Against, with reservations for." Letters placed in this category contained some such phrase as "I like microfiche, but..." All libraries which had extensive microfiche holdings fell into this category.

Against. This classification offered few problems in dealing with individual letters—*e.g.*, "The man who invented microfiche should be drawn and quartered." It became more difficult in dealing with libraries, until I realized that the most operational way for a library to vote against microfiche is not to use it. Accordingly, both those libraries which damned microfiche while using it and those which damned fiche by not using it were placed in the "Against" category.

Corporate Authors. In most cases it was possible to infer the type of employer, even when the letters were hand-printed on postcards. Most types of employer offered no classification problems. I made the arbitrary decision to list the AEC contract research laboratories, such as Oak Ridge National Laboratory and Los Alamos Scientific Laboratory, under AEC as the corporate author, although one of these is more properly industrial and the other university.

SOURCE OF INFORMATION

The information-bearing letters were sorted by source of employment of the author into the categories shown in Table I.

LIBRARIES AND MICROFICHE

Replies from libraries were tabulated as shown in Table II.

Industrial libraries, the bulk of which were in aerospace companies, led all others—with the exception of the captive libraries of AEC and NASA—in the use of microfiche.

Conversely, Department of Defense libraries, of whichever service, and university libraries lagged behind all others in the use of microfiche. For many of the DoD libraries in the "Against" column, the Defense Documentation Center's 1 July 1968 imposition of user charges for hard copy was their first exposure to the use of microfiche. The timing of this action to start at the beginning of a fiscal year created a number of problems for libraries

Table I. Where My Correspondents Worked

Source	Individuals	Libraries
Industry	71	60
Universities	20	19
Department of Defense	30	65
NASA	5	5
Other federal agencies	10	21
	136	170

Table II. Replies from Libraries

Source	For, with Reservations	Against, or Don't Use
Industry	40	20
University and nonprofit	7	12
Department of Defense		
Air Force	8	19
Army	5	14
Navy	5	14
NASA	5	0
Atomic Energy Commission	9	0
Other federal agencies	7	5
	86	84

which had neither microfiche reading equipment nor money programmed in their FY 69 budgets to buy it.

One encouraging note among DoD libraries was from those in service academies and the Air Force Institute of Technology, which said that cadets, midshipmen, and students at AFIT accepted fiche with far less grumbling than their elders. "Apparently they were never told that this was not normal procedure. Further, they were young, adaptable, and less set in their ways."

Industrial libraries reported holdings of up to 300,000 NASA and DoD fiche in a single library. User adoption of fiche seems to be by *force majeure:*

"Since time is a crucial factor in many instances, our engineers are grateful for any form of a report which is available NOW! Therefore, forced by economic and time factors to use reports in microfiche form, most engineers have adapted to the way it is!"

Libraries with successful microfiche installations seemed to share the common characteristics of:

1. Enthusiastic librarians who were able to
2. Get the support of management, especially in providing enough money to
3. Buy adequate numbers of microfiche readers, reader-printers and copiers (and filing boxes for individuals to use!), and
4. Cajole, educate, and seduce their users into giving fiche a fair trial before they condemned it.

INDIVIDUALS AND MICROFICHE

Replies received from the 136 individual users are shown in Table III.

The 41 enthusiasts for microfiche constitute a fairly rigorous counterproof to the statement: "No scientist or engineer can (or will, or should, or be driven at gunpoint to) use microfiche."

Table III. Replies from Individuals

Source	For	For, with Reservations	Against
Industry	17	18	36
University, nonprofit	7	4	9
Department of Defense	9	9	12
NASA	2	...	3
AEC	2	...	3
Other federal agencies	4	...	1
	41	31	64

Reasons for Liking Microfiche. The reasons may be tabulated as follows:

Building personal reprint collections	11
Save storage space	7
Ease of retrieval and manipulation (!)	3
Low cost	3

A personality profile of the typical microfiche fan would closely resemble what we information scientists term, technically and nonpejoratively, a "pack-rat." That is, a heavy literature user with an extensive reprint collection, fairly large expenditure of personal funds on books, journal subscriptions, and society memberships, and, as is the unfortunate lot of pack-rats, an unsympathetic supervisor who can't understand why they must live in that clutter.

These people, may their tribe increase, are obvious markets for:

1. Microfiche editions of books, journals, and reports.
2. Personal, portable (and even "cuddly") microfiche readers.
3. Filing boxes (and systems) for fiche.

And, less obviously,

4. Inexpensive personal, or coin-operated public, step-and-repeat cameras so that they can make their own microfiche, *ad libitum,* of material not on fiche—e.g., income tax files.

They are not, repeat not, a potential market for reader-printers and should be discouraged from acquiring them.

Reasons for Disliking Microfiche. The 47% of individual users who disliked microfiche did so for the following reasons, ranked in descending frequency:

1. Unavailability of, or difficult access to, readers.
2. Inability to make notes on fiche.
3. Poor optical and mechanical quality of readers.
4. Can't read fiche at home, on airplane, etc.
5. Can't flip pages, refer back and forth from appendix to text.
6. True cost of blow-backs is probably greater than 25¢ a page, especially when scientists or engineers must operate the reader-printers themselves, as is frequently the case.
7. Printouts are unwieldy, thick, curl up into Dead Sea scrolls.
8. Personal reading rates are slowed.
9. Can't read and work with graphs, tables, and continuous-tone photographs, especially with negatives, when they're accustomed to reading positives!
10. Can't identify fiche by color and physical location.
11. Can't scan quickly.
12. Poor indexes to what's available on fiche.
13. Hard to store.
14. Can't tear pages out, either for personal files or to buck to friends.
15. Can't read titles without readers.
16. Lack of standardization in fiche size—e.g., COSATI *vs.* industry *vs.* IBM standards.

My casual conversations with scientists where I work and elsewhere had led me to think that the people who objected to microfiche didn't like to read anyway, and that microfiche gave them one more convenient excuse not to read. This is not the impression I gained from these letters. It may be highly subjective, but the impression I now have is of people who are good, almost compulsive readers, who have built up good reading habits—if I may be forgiven for writing like my late librarian father—and who are intensely frustrated by having artificial barriers placed between them and the printed word.

WHAT'S WRONG WITH TODAY'S MICROFICHE EQUIPMENT?

Dissatisfied users vented especial and detailed anathemas on microfiche reading equipment currently available. Their objections included, but were not limited to:

Fixed viewing angles, requiring immobile head position. This is particularly difficult for wearers of bi- and trifocal glasses.

Inability to read sideways layouts without crawling up on desk.

Screen glare.

Focusing problems across entire fiche, a carrier alignment problem.

Poor definition of lenses, compounded by poor-quality fiche.

Need for families of lenses, to cope with varying reduction ratios of fiche.

Tendency for motion sickness, caused by movement of images across screen during search.

Need to keep fussing with focus.

Lack of light shields, so that sufficient contrast is not available unless overhead lights are turned off.

Not easy to flip from text to appendix and find frame you left when you want to come back.

Lack of true portability—putting a handle on it doesn't make it portable.

WHAT'S WRONG WITH MICROFICHE THEMSELVES?

Poor quality control. Readers report missing pages, others out of focus.

Lack of continuous tone emulsions makes photographs—*e.g.*, photomicrographs of metal structures—useless, especially on negative fiche viewed directly.

Fingerprints, splotches, daubs, and mildew on fiche

Subscripts, superscripts, and footnotes set in 6 point type disappear when journal articles are microfiched.

"As for report organization, defense agencies have a significant job to do. When the illustration on page 24 is discussed on page 17; when a citation to number 12 in the bibliography sends one to page 124; when the organization and contents of a chapter are found only by locating the Table of Contents beginning on page iv; when the color-photo illustrations are meaningless blurs in black and white; when the labels on a graph read like engraving on a wedding band, the willing microfiche user is in trouble and tends to revolt."

GENERAL RECOMMENDATIONS

There would seem to be three, and only three, possible strategies for dealing with microfiche.

A. Ignore it and it will go away.
B. Drive it underground.
C. Learn to live with it until something better comes along—and it probably will.

Ignore it and it will go away. A library which has been conscientiously accumulating government reports over the past two decades may well find that it now holds:

AEC microform reports in microcard and microfiche. Two microfiche files to account for the change in size of the forms.

NASA microfiche—two files, the size again.

DoD microfiche. Be grateful that there is only one size.

DoD microfilm, filed by numbered reels and/or tag ends of separates in little cartons. Be grateful that it is only in 35-mm.

Engineering drawings on aperture cards—punch card size, so need separate file boxes.

One or more readers for 16-mm cartridge microfilm, to take care of such useful items as manufacturers' catalogs or American Chemical Society journals. There is at least a strong probability that the 16-mm cartridges will not be interchangeable among the different readers.

The librarian who has watched federal agencies switch from 35-mm roll microfilm to microcards (remember?) to the early NASA 5- × 8-inch microfiche, and now the COSATI standard size (which is not the same internally as the industry standard), buying equipment to read each microform and watching it grow dusty through disuse, who knows that somewhere down the pike are goodies like ultramicrofiche and photochromic fiche, and who has listened to glowing tales of how some day all information will be in a central data bank—either digitalized in a computer or stored as images to be flipped before a video camera—with console access, may well be pardoned for thinking that microfiche is just the latest fad. Perhaps some day a microform will be produced that will prove as useful for scientific and technical reports as aperture cards have for engineering drawings, 35-mm microfilm for scholarly (i.e., archival) documents, and 16-mm cartridge microfilm for journals and catalogs—and most of the work-horse applications of microfilm. But there is ample evidence that microfiche as we know it is not that form.

Drive it underground. There is strong evidence in this report that librarians can learn to live with microfiche, and even grow to like it. Microfiche has many advantages for library operations. It is economical to buy, to mail, and to store. Filing and retrieval are no more difficult, and in many ways easier—at least on the feet—than conventional hard-copy reports. Microfiche enables a library to have available for immediate access copies of several hundred thousand reports without having to take over a disused wing of the plant for storage space. Reading is the main problem with microfiche, but it is rare that a librarian would have to read more than a few pages of fiche—just enough to identify and catalog it.

The major squawks occur when a scientist or engineer is handed a microfiche and is pointed in the direction of the nearest reader. I see no reason why he has to be told that there is such a thing as microfiche. The existence of microfiche could well become a closely guarded secret between the librarian and its federal report-supplying agency. The scientist user has certainly become accustomed over the years to trying to read illegible reproductions of reports made from microfilm at a central agency. There is no reason why he should ever have to know that the illegible document he is handed was locally reproduced from microfiche rather than centrally at DDC or the Clearinghouse.

The individual who insisted upon purchasing microfiche for private consumption might well be issued a warning slip:

"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.

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Microfilmed Catalog Services*

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Received September 17, 1969

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

*Presented before the Division of Chemical Literature, Microfilm Forum, 158th Meeting, ACS, New York, September 10, 1969.