

User's Reaction to Microfiche A Preliminary Study

Recent emphasis placed on the use of microfiche by large government agencies has increased the pressure on libraries supporting government research to make greater use of microfiche. Negative and apathetic user attitudes, expressed by researchers, indicate that expanded use of microfiche will have to be accompanied by concentrated efforts to overcome resistance if the great potential of microfiche is to be realized. Efforts in microphotography, expended on technical achievement in the past, should be directed toward understanding the user and his needs to discover why he avoids microforms and how to overcome his resistance to them.

THE POTENTIAL VALUE offered by photographic technology in the publication, storage, and dissemination of recorded knowledge and information has been recognized for well over a century.

The use of microphotography to compress the bulk of printed material, demonstrated as early as 1853 by Rosling's experiment with microcopies of a newspaper, has made a great impact on information handling activities.¹ It has made great contributions to the advancement of scientific and humanistic studies by making rare, out-of-print, and other difficult to obtain materials available.² It has preserved printed materials during war and has offered countless libraries a way to improve their collections.³

Microfilm, microcards, microprint, and now microfiche offer potential economies in space, in acquisition and bind-

ing costs, costs in distribution of copies of materials, and library circulation costs. There are benefits, both realized and potential, in the extension of interlibrary loan services, in opportunities for individuals to obtain personal libraries of their own at little expense, and in more effective teletransmission of photofacsimiles.⁴

Still, the impact on library operations and exchange of information often prophesied for microphotography has not been realized.⁵ Explanations are many for the failure of this potential to materialize, including deficiencies in the quality of the microfilmed image, difficulties in indexing information stored on microforms, problems with bibliographic description of materials and many other aspects of microphotography. It becomes downright disheartening in reviewing the literature to find that the basic problems foreseen in the earliest trials are still the basic problems cited in our day.⁶

Perhaps the most basic of the problems is the reluctance of users to accept microcopies. This reluctance is caused mostly by inconvenience and

At the time this study was conducted, Mr. Lewis was Director of the Library in the Boulder (Colo.) Research Laboratories of the Environmental Science Services Administration.

deficiencies in the quality of equipment available for reading photoreduced materials. While many of the technical advantages originally anticipated have been realized, the whole of these efforts have failed to realize the total potential partly because the user has not been given sufficient consideration.⁷ Microfiche, despite its real and supposed advantages, might suffer the same fate unless user resistance is dealt with more effectively.

Advantages and disadvantages notwithstanding, the hard fact remains that libraries and other organizations involved in the exchange of information must expect to acquire and provide more and more information in microforms of all varieties.

PURPOSE OF THE STUDY

Changes in the distribution of government technical information will make the use of microfiche increasingly widespread, especially for libraries that support government research. Emphasis placed on microfiche by the four large governmental dispensers of technical information, as a primary medium in their technical distribution programs, began with the DDC change of policy in July 1968.⁸ Many of the technical reports in hard copy format previously available through DDC and NASA at no cost are now distributed through the Clearinghouse for Federal Scientific and Technical Information at \$3.00 per copy. Microfiche copies, however, have continued to be available at no cost. The Boulder Laboratories library has depended heavily on technical report materials for many years from both DDC and NASA, and in both formats.

Policy changes by DDC and NASA impelled the Boulder Laboratories library to make still another significant change in policy: it could no longer pay, because of budget restraints, for technical reports that its laboratories requested. With the new charges, labora-

tories were required to buy with their own funds all those reports that were to become the property of their divisions or sections.

For three reasons, this change precipitated the study on microfiche user attitudes reported here. First, it intended to increase users' awareness of microfiche, since they would come more and more in contact with it.

Second, it intended to stimulate interest in microfiche, partly because of the announced changes, but also because the library had accumulated a little-used collection of more than 70,000 technical reports in microfiche form.

Third, it was expected that the change in library policy would have the initial effect of stimulating interest in microfiche on the part of the laboratory people in order to conserve funds for research activities. Knowledge of how microforms had been received in other libraries in the past and reactions by our own library users led to the belief that original enthusiasm would soon wane unless something was done to overcome negative response from laboratory people. The intent was to poll users to obtain a better idea of how they would accept the change.

The library sent out short questionnaires attached to memos explaining the new policies. The responses provided excellent information which appears to be worth reporting to a wider audience, since an extensive review of the literature produced no direct reports of user reaction to microtext (if one excludes the reports of librarians who report reactions of their own and their library patrons). Although the study concerns users of only one specific library, responses come directly from scientific and technical people working in the laboratories and, by-and-large, confirm and help explain reluctance to use microforms. However, there is a surprising acquiescence on the part of those responding, suggesting that some atten-

tion to their needs could overcome a considerable amount of their resistance.

There was no attempt to get a highly controlled statistical sampling. Rather, forms were sent to all people who might be concerned and everyone was provided with an opportunity to respond. No follow-up was made on unreturned questionnaires; therefore, some valid limitations may exist on the extent to which results can be applied outside this institution. Nevertheless, when results obtained in this study are considered in a broader context, that is, with other reports in the literature of similar nature, and with library experience, they appear to be valid. They may indeed be indicative of the general response to microforms.

The objective was well served, in any case, because the poll drew from those responding an indication of collective interest, as it existed, and some idea of the problems to be overcome. Of even more value were some individual comments received reflecting subjective feelings that were not evident in the checked responses on the questionnaires. Statistical analyses are of little practical value when the library is confronted by a single user. If he likes microfiche he must be served; if he does not, he must still be served.

Two versions of the questionnaire were distributed. The first version was sent to forty people who normally received the NASA STAR (*Scientific and Technical Aerospace Reports*) from which they selected technical reports for review. Fourteen of those, or 35 percent, were returned.

The questionnaire was later expanded by one question and sent to a much wider audience of 681 laboratory people at the Boulder Laboratories and ESSA (Environmental Science Services Administration) Research Laboratories in Boulder, the rest of the United States, and in Peru. Of these fifty, two (or 7.5 percent) were returned. Responses (9.1

percent of all sent out) came from all of the National Bureau of Standards divisions in the Boulder Laboratories and thirteen of the seventeen ESSA Research Laboratories, giving a broad if not a perfect sample.

The results from each version of the questionnaire are differentiated in Tables 1, 2, and 3 because they originated from two different groups. The first group consisted of people whose pattern of use was somewhat known (moderate to heavy users of technical reports). The second group consisted of all "professional" laboratory employees, whose use of the library was less well known.

After the results of the first survey were received, a fourth question was added, because most of those responding thought that microfiche would be fine for the library collection as long as they could be converted to full-size, hard copy before they were used. Since such service could not be provided and because this approach to microfiche use would cost more than the purchase of the item in hard copy to begin with, the library asked how the limitation on copying would affect the general response to the first question.

Questions were structured to provide a kind of opinion scale, with the first one or two possible responses giving positive opinions, the third possible response giving a noncommittal acceptance (perhaps a lack of opinion) and the last two indicating negative opinions. They were also structured to narrow the user's perspective from a broad idea of the value of microfiche to the library's use of microfiche and finally to his own personal feelings about his use of the medium.

Table 1 illustrates the range of opinions given by respondents concerning the suitability of microfiche as a medium for the dissemination of technical information. Their responses set the tone for the rest of the study by an

overwhelming lack of enthusiasm. Positive opinions were outnumbered by almost two to one. Furthermore, many of those who considered microfiche to be acceptable added significant comments that modified their acceptance. For example, many indicated that microfiche would be acceptable for materials that were to be scanned for relevance, but that materials needed for study or use in research were needed in hard copy if they were needed at all. Some acknowledged that microfiche might afford some savings in space and distribution costs, but that the user was not being considered.

For most of those responding, microfiche was merely acceptable at best, but even this opinion was reluctantly given.

TABLE 1
RESPONSES TO ITEM 1 ON VERSION 1 AND 2
QUESTIONNAIRES

Microfiche as a technical information medium is:	1st Version	2nd Version	Total	Percent
excellent	1	0	1	1.5
very good	0	11	11	16.7
acceptable	8	21	29	43.9
poor	2	16	18	27.3
unacceptable	2	1	3	31.8
*Other	1	3	4	6.1
Totals	14	52	66	100.0

* Responses that did not readily fit into any of these categories are represented as "other" at the bottom of each table.

Nevertheless, most thought that the library should have a significant amount of its collection in microfiche, if the microfiche was limited to technical report materials (see Table 2). Fewer than 10 percent of those responding thought that a substantial part of the collection (other than technical reports) should be in microfiche. Almost 37 percent thought that microfiche should be acquired only when materials were not available in hard copy. Only six people were positive toward the library col-

lecting materials in microfiche. The great majority agreed that the library should collect some material in this form, but only items not otherwise available, or technical reports, which are considered by many laboratory people to be inferior to books and journals. Only four

TABLE 2
RESPONSES TO QUESTION 2

The library should:	1st Version	2nd Version	Total	Percent
a. collect a substantial part of its material in microfiche	0	6	6	9.1
b. collect only reports in microfiche	6	22	28	42.4
c. acquire in microfiche only those materials available in no other form	6	18	24	36.4
d. not accept microfiche except in rare instances	1	1	2	3.0
e. not accept or collect microfiche at all	0	2	2	3.0
Other	1	3	4	6.1
Totals	14	52	66	100.0

TABLE 3
RESPONSES TO QUESTION 3

I, personally:	1st Version	2nd Version	Total	Percent
a. prefer microfiche copy	0	0	0	0.0
b. like microfiche very much	0	3	3	4.5
c. will use microfiche	9	21	30	45.5
d. do not like to use microfiche	2	24	26	39.4
e. will not use microfiche	2	2	4	6.1
Other	1	2	3	4.5
Totals	14	52	66	100.0

people, however, were against microfiche being in the library.

The personal preferences expressed in response to question 3 are most revealing, and they indicate the nature of the problem faced in eliciting greater use of microfiche. The pattern of response follows all past trends reported in the literature that account for the "failure" of other microforms to be accepted by the user. Table 3 is self-explanatory as far as the data are concerned, but more was received to interpret than the raw data. In answering the question, one person added to response (c) this comment: "I will use microfiche . . . reluctantly," which sums up the general attitude toward microfiche among those responding. Another added this modification to the same response, "I will use microfiche . . . if hard copy is not available." Ten others added comments indicating that they would use microfiche *if* some condition or other were met or if no alternative were possible.

As stated, data were derived from a sample that may not be statistically ideal. If they can be interpreted to apply only to respondents, and not the whole population of library users (or users of microfiche in general) at the ESSA Research Laboratories, we must at least overcome the negative attitudes of forty-one of our users. This is significant in a local context.

The question involved here is fundamental. Microfiche, or any other microform, is intended mostly as a benefit to a library and to other information handling activities, but not necessarily to the user. The reasons usually given for the use of microforms in these activities involve the technical advantages that accrue to the library or to the distributing agency, such as less cost in distribution, the saving of space, and the preservation of deteriorating materials. Some, such as preservation of materials and making rare materials more generally

available, are intended to benefit the user, too, but again through impersonal, technical advantages. As some respondents indicated, these technical advantages are of value to the user only when no other alternative is available, but users still prefer the hard copy.

If no alternative to microfilm or microfiche is provided, users can be required to use or not use them, but this approach is partly self-defeating when many dislike or refuse to use what is provided. What is desired is to generate a flow of information to individuals with the least hindrance possible. Either information is not as valuable as one is led to believe, or the technical advantages that libraries and distributors of information gain are not enough. User reluctance and antagonism have limited the use of microforms in many libraries where microtexts have proven most valuable with items that have a low probability of use. There appears to be no reason to expect any change in attitude in the case of microfiche unless there is a much greater emphasis on overcoming problems involving user comfort, convenience, personal preference, and research habits.

This assertion is further illustrated by the response received to the fourth question. The intent of agencies disseminating microfiche is that the microfiche be used without reproducing the material in hard copy. When it was explained that the library had no facilities to provide hard copies for users, their general opinions of microfiche were drastically altered, again toward the negative (see Table 4).

Within the same group of people responding to the second version of the questionnaire, the number who considered microfiche a very good medium dropped from eleven to one. The number who thought it acceptable dropped from twenty-one to nineteen. The number who considered microfiche unacceptable rose from one to seven. Nega-

tive responses increased by eleven, and none of the fifty-two respondents considered microfiche to be an excellent medium under either circumstance.

TABLE 4
RESPONSES TO QUESTION 4

There are no facilities at the Boulder Laboratories for large scale reproduction of microfiche to hard copy. Only a limited number of pages from any report can be reproduced. Under these circumstances, microfiche as a medium of dissemination of scientific and technical information is:

	Total	Percent
excellent	0	0.0
very good	1	1.9
acceptable	19	36.6
poor	21	40.4
unacceptable	7	13.2
Other	4	7.7
Totals	52	100.0

Lack of facilities to reproduce microfiche in hard copy mysteriously improved the prospects for two. Eighteen responded in the same manner as they had on the first question, while twenty-four considered this condition an added detraction (see Table 5).

TABLE 5
EFFECT ON ACCEPTABILITY OF MICROFICHE
OF LIMITED COPYING FACILITIES

	Number of Responses*		Change
	Item 1	Item 4	
Excellent	0	0	0
Very good	11	1	-10
Acceptable	21	19	- 2
Poor	16	21	+ 5
Unacceptable	1	7	+ 6

* Responses represented in this table are limited to those taken from the second version of the questionnaire.

SUMMARY OF RESPONSES

In general, the results of the survey lean toward the negative. (Perhaps "lurch" would be a better term.) More than half of the responses indicated acceptance of microfiche, but with reser-

vations. More than 85 percent indicated acceptance only, or a negative attitude toward use of microfiche. Fewer than 9 percent of the answers were unmistakably positive in tone, while one-third were clearly negative (Table 6). Only five of the comments were positive in tone; twenty-four were unmistakably negative. Thirteen comments so altered the sense of the possible responses on the form questionnaire that they could not be fitted into the patterns intended.

The complaints registered in these comments are the same complaints librarians have always heard about materials in microform. The preferences indicated are no different than preferences of other scholars. The problems that have plagued the use of microforms are still very real.

TABLE 6
TOTAL RESPONSES EVALUATED

	Number of Responses	Percent
Positive	22	8.8
Acquiescent	130	52.0
Negative	83	33.2
Other	15	6.0
Totals	250	100.0

There is some indication that the problems are not overriding, however, even in our study. The positive comments, although few, cite two instances where microfiche has been accepted without difficulty. One respondent explained that when microfiche can be checked out of the library for use, it is acceptable. Another person reported, "we spend 8 to 24 hours per week reading (microfiche)." There are other examples of successful use of other microforms in the Boulder Laboratories. The most notable of these has been the use of microfilm produced directly from the computer by means of the DD 280 Microfilmer. A number of high quality microfilm reader-printers have been made

available in the computer laboratory so that the computer-produced microfilm can be read at the convenience of the user and portions taken off the microfilm in hard copy at the discretion of the user. These two conveniences seem to have overcome the resistance evident in so many other situations. This last example may be somewhat misleading, however, because the materials that are filmed in this manner are very often compilations of data in the forms of tables, charts, or graphs that are not read in the same manner as narrative reports or articles.

TABLE 7

FACTORS DETRACTING FROM MICROFICHE FROM COMMENTS ON QUESTIONNAIRES

Factor	No. of Comments
Preference for hard copy	18
Use of materials restricted to location of readers and printers	7
Quality and number of readers available	5
Comfort lacking with equipment available	4
Light reflected from reader screen	2
Eyestrain	2
Lack of standardization in films and equipment	1
Quality of photographic copy	1

APPLICATION OF STUDY RESULTS

Since this study was completed, the Boulder Laboratories library has initiated a plan to make more extensive use of microfiche in its activities, including the filming of a substantial portion of its technical reports collection. In planning for this project, attempts have been made to meet as many objections to microfiche as possible. Foremost in these plans will be the liberal scattering of readers throughout the Research Laboratories with the goal of providing a reader for each small group of researchers and providing readily available reader-printers (on each floor of each building

where possible) so that some of the inconveniences mentioned by respondents will be overcome. While the intent is still to promote the use of microfiche as microfiche, liberal copying privileges on readily available equipment will allow researchers to copy charts, graphs, drawings, photographs, formulae and other data that are more usable in hard copy.

The one factor that is beyond the library's control is the quality and convenience in the design of machinery available for reading microfiche, especially equipment that is inexpensive enough for purchase in large quantities. Statements abound in the literature insisting that quality viewing and copying equipment must be available in order to make effective use of microforms. They also show that such simple problems as inserting the filmed item into the viewer is an extremely important factor in acceptance by users. Even though there has been a proliferation of models available, there has been relatively little progress in the design of readers and reader-printers that are economical enough to allow most organizations to scatter them liberally where the materials will have to be used and that are of good enough quality to assure their acceptance and steady use. After the data reported here were gathered, the library arranged a display and demonstration of microfiche equipment. Machines from six manufacturers were available for viewing and use. The comments received were almost uniform: the inexpensive viewers were not acceptable. Those in the \$300 to \$400 range were. It is evident that the extensive use of microfiche will require considerable effort and expense.

It is difficult to understand why those engaged in the distribution of microforms and the sale of equipment for its use have not been able to overcome problems envisioned long before microphotography was extensively used in in-

formation distribution. Past experiences clearly show that the user has rejected these media when other alternatives exist, mostly because of discomfort and inconvenience. To a large extent, we are still at the point where all this began. The technical potential of microforms is still under-exploited, as much because of failure to come to grips with the needs, the desires, and the idiosyncracies of the user as of any other factor.

Whether the limitations of reader quality, user preference for hard copy, standardization needs, and deficiencies in quality of photography and reproduction can be overcome to reach full exploitation of microfiche may be doubtful for the moment at least.

CONCLUSIONS

Use of other microforms has increased greatly since the late 1930s, but it is still confined mostly to preservation of materials (newspapers and manuscripts), to distribution of materials that are available in no other form, and for storage of older materials that have comparatively little probability of use. The reluctance exhibited by users has had much to do with this limited utilization of microforms and thus could also seriously limit the use of microfiche despite the great pressures being exerted. The man who must use the material may ultimately decide the extent of the value of microfiche in research activi-

ties, the same as he has in effect determined it for microfilm and microcards. It seems logical that the needs of the user should be the next area of major concern for librarians, for the increasing number of commercial firms providing materials in microfiche, and for manufacturing firms that market reader and reader-printer equipment. Technical advancement has not completely overcome all problems in microphotography, but it has outstripped knowledge of how to get people to take advantage of microtext materials. The acquiescence exhibited in this study could possibly be directed toward acceptance and some of the negative responses could hopefully be improved.

Those who work in the information professions should do extensive market research on how services and products are received. More comprehensive studies providing closer controls and more statistically reliable data should be undertaken to determine, at first hand, what the advantages, limitations, and potentials of microforms really are. The weaknesses in available equipment should be identified and design of better ones sought, so that users will accept them. We should work on ways to introduce and acquaint users with microforms, for they will undoubtedly be a greater part of our future than they have been of our past. The great technical potential needs only to be matched by use.

REFERENCES

1. Frederic Luther, "The Earliest Experiments with Microphotography," *American Documentation* 2:167-70 (August 1951).
2. Tonnes Kleberg, "Some Uses of Microfilm in the Library at the University of Uppsala," *Journal of Documentation* 7: 244-51 (December 1951).
3. L. Moholy, "ASLIB Microfilm Service; the Story of Its Wartime Activities," *Journal of Documentation* 2:23-31 (June 1946).
4. Charles G. LaHood, "Microfilm as Used in Reproduction and Transmission Systems," *Library Trends* 8:338-457 (January 1960).
5. Fremont Rider, *The Scholar and the Future of the Library; a Problem and Its Solution* (New York: Hadham Press, 1944); R. R. Dickison, "The

- Scholar and the Future of Microfilm," *American Documentation* 17:178-79 (October 1966); K. D. Metcalf, "Implications of Microfilm and Microscript for Libraries," *Library Journal* 70:718-23 (1 Sept. 1945).
6. Charles Bishop, "Problems in the Production and Utilization of Microfiche," *American Documentation* 12:53-55 (January 1961); Hubbard W. Ballou, "The Microfiche," *Library Resources & Technical Services* 8:81-85 (Winter 1964); William G. Harkins, Fred L. Dimock, and Mary Elizabeth Hanson, "Microfilm in University Libraries: a Report," *College & Research Libraries* 14:307-16 (July 1963); David C. Weber, "Specifications for a Superior Microtext Reading Machine," *American Documentation* 17:178-79 (October 1966); Jerry McDonald, "The Case Against Microfilming," *American Archivist* 20:345-56 (October 1950); Maurice F. Tauber, "Problems in the Use of Microfilms, Microprint and Microcards in Research Libraries," *Industrial and Engineering Chemistry* 42:1476-78 (August 1950); Jerome Wilcox, "The Point of View of the Librarian," *American Documentation* 2:162-66 (August 1951).
 7. Alan B. Pritsker and J. William Sadler, "An Evaluation of Microfilm as a Method of Book Storage," *College & Research Libraries* 18:290-96 (July 1957).
 8. "Requests for Most 'Hard Copies' Subject to \$3 Charge in July," *Defense Documentation Digest*, No. 31 (6 May, 1968).