2005

Microforms: Marriages, Mergers, and Migrations

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“Migration” is a term used to describe the reformatting of materials or the moving of information from one format to a different format. The conversion of printed and original documents to microformats was a migration from paper, which was regarded as impermanent, to film, which was regarded as permanent. Today the term “migration” is most often used to denote the conversion of print or microform texts to electronic format to another. This paper begins with a brief history of the development of microforms as a storage and preservation medium with emphasis on the last two decades of the twentieth century in the United States. Recent issues in access and preservation are examined. Finally, the future of microforms is considered in light of migration to electronic formats for preservation.

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Microforms: Marriages, Mergers, and Migrations
by
Anna H. Perrault

History

The production of microforms can be traced to an invention by John Dancer of Manchester, England, who in 1839 had the idea of “marrying” two devices with lenses to fashion a camera which would produce the magnification of a microscope. Thus, microphotography was invented. At first, the invention was utilized to incorporate portraits into jewelry. The technique migrated across the Channel to France and an industry grew through demand for the microphotographic novelties. Rene Dragon is reported to have had over one hundred and fifty workmen turning out the popular jewelry. A more significant and utilitarian use emerged when the city of Paris was surrounded by Prussian troops for five months during the Franco-Prussian War in 1870. There were no satisfactory communications media for correspondence and news into or out of the city during the siege. Dragon was employed to fly out of the city in a balloon with his microphotographic equipment and photograph letters and official dispatches to be sent back to Paris via carrier pigeon. Thus the second major use for microphotography became the reduction of correspondence to make it more easily transportable for governmental work and espionage. Dragon had shown that large volumes of information could be reduced to minuscule amounts of space.¹

In 1906, Robert Goldschmidt and Paul Otlet published an article in the Bulletin of the International Institute of Bibliography in which they suggested that books could be reproduced onto small sheets of film, a forerunner of microfiche. The paper received little attention and was re-published in 1925.² Around that time, George McCarthy sold the idea for a new system of microfilm processing to the Eastman Kodak Company. The process was named Recordak for a new division of Eastman which McCarthy headed. The process utilized a new microfilm camera and included a machine for viewing the microfilm. Microfilming was adopted by business and industry for records management, e.g. banks for cancelled checks, insurance companies for policies.³ We can see that microfilming was not first utilized in education, but in government and business.

By the 1930s, several large research libraries-- Harvard, Yale, and the Library of Congress-- had begun building microform collections and also selling copies of works the libraries owned. American researchers saw the advantages of using microcopying for manuscripts and archival materials from Europe.⁴

By the mid 1930s, Eugene Power had founded University Microfilms and the U.S. Government had begun filming copies of paper documents for wider distribution. Power began filming English books printed prior to 1550 and also initiated Dissertation Abstracts and the filming of
the dissertations indexed in DA. The primary applications of microfilming as described by Power are:

- a means of protecting books, manuscripts, and document against low and unnecessary use
- securing permanent copies of ephemeral material
- obtaining copies of material in distant depositories
- reducing the space occupied by a collection of materials in traditional formats
- original publications of scholarly and technical material
- republishing material in short supply or out of print

During the years after World War II in the United States, new colleges and universities were built to accommodate the large number of war veterans going to college. These new institutions’ libraries had funding to buy entire collections and an industry sprang up to produce collections of out-of-print and rare books and periodical and newspaper backfiles. In the 1950s a number of different microformats were employed: microfilm, microprint, microcard, and microfiche. (The term “microfiche” is derived from the French “fiche,” a sheet or card and is one of the oldest microformats.) The growth period for the library microforms market was the 1950s and 1960s. In 1970, the Association of Research Libraries reported that the proportion of microforms to printed books in research libraries was nearing 25 percent with an average of half a million microform units per library.

By the early 1970s the development of microphotography and microcopying had matured as an industry made up of a number of large corporations plus smaller “cottage” industry type companies. Whether or not these for-profit companies should remunerate libraries for being given permission to microfilm original materials was controversial. There were also copyright issues. Although the production of COM (computer output microfilm) had been introduced in the 1960s COM was mainly used in the production of library catalogs and other technical and records producing operations. Thus, COM did not threaten the micropublishing industry, but was an addition to it. There would be little change until the technological revolution which began in the 1980s. Microforms had become a major component of managing library collections and a number of issues had emerged.

In a review of the literature from 1975-1984, Farrington summarized the developments during those ten years:

For individuals who held the euphoric view that microforms were a panacea for all library preservation ills and collection shortcomings, this was a time of coming to terms with reality. For those who dreaded that microforms had met their demise, there was new excitement about the format with the introduction of COM, the availability of new reference tools on microfiche such as Phonefiche and college catalogs, the adoption of standards for archival quality film, and the beginnings of true bibliographic control of microforms.\six

During the period from 1974-1985 there was a preoccupation with user resistance to microforms and in the latter years, articles promoting the education of users in the benefits of microforms. Introduced in the 1970s, ultrafiche did not gain acceptance. In this same time frame, the bibliographic control of microforms was advanced by the major bibliographic databases, OCLC and RLIN.\x Even in the decades that micropublishing was flourishing, with regard to collection development Yerburgh observed that microforms were most often not acquired on a systematic basis as were books and serials. Furthermore, “Until such time as microforms are acquired in the same systematic manner that books are, the medium will always remain something of a bibliographic wild card.” \sixi With the exception of periodical backfiles and a few microform series placed on standing order, microforms remained an on demand acquisition or a last minute purchase when a sudden windfall provided large sums of funds to be expended on short notice.

The last editions of Microform Research Collections: A Guide and An Index to Microform Collections (Meckler) in 1984 may be considered a turning point in the history of the microform marketplace. Articles on the death of microforms began to appear: “Will the Optical Disk Kill Microfilm?\xxvi Micrographics at the Crossroads,”\xiii and “The Microform: A Solution in Search of a Problem?”\xiv among a few of them. Some, however, did not participate in the eulogizing. Sir Charles Chadwyck-Healey\xv and Allen Veaner,\xvi two well known figures in the microform world, and William Saffady, with expertise in both microforms and computer technology, all envisioned a future for microforms and emphasized the unproven nature of electronic media. In the latter 20th century, electronic storage came under increasing scrutiny and disillusionment by the library and archival communities.

In the 1980s the profile of microforms reached an historic low according to Yerbrugh\xvii After 1980, the prominence of microforms began to wane as library budgets did not experience the increases needed to keep the same rate of collection building as the halcyon days of the past thirty years. The terms “resource sharing,” and “cooperative collection development” were employed with increasing frequency. The market for microform collections was changing with the beginnings of the computer revolution which first affected the compilation of indexing and abstracting tools, although digital technology did not seriously challenge the production of microform products until the 1990s.

Merger-mania in the publishing industry began to accelerate in the 1980s. By the end of the
1990s, many of the older, established micropublishing companies had been acquired and merged into larger publishing conglomerates. Congressional Information Service (CIS) acquired another micropublisher of government publications, Carrollton Press. CIS was, in turn, acquired by Lexis-Nexis, merging the old -- microforms-- with the new -- electronic databases. Lexis-Nexis was later acquired by Reed-Elsevier. Readex became part of Newsbank, Inc. Chadwyck-Healey, Norman Ross, and Research Publications were all acquired by University Microfilms which in turn began a division of Proquest-Information Learning.

This brief history has concentrated upon the U.S. library market in the latter half of the 20th century. Norman Ross has been in the microforms business for over 30 Years. His paper is entitled......

Issues

Access

There are several different kinds of access with regard to microformats. One type of access is physical, the actual reading of the film product. Another type of access is bibliographic access, the description, cataloging, and indexing of microform titles to provide information for researchers to find out the existence of a title in microform. Within bibliographic access there are standards for cataloging and description as well as indexing of the contents of collections.

Microforms are simple and relatively uncomplicated in terms of physical access. Although librarians liked microforms for their compactness and relative affordability, readers only tolerated microforms because they could generally not obtain the materials they sought in printed or original formats. There has not been a large body of research devoted to user attitudes toward the usability of microforms. James H. Sweetland conducted a study of access times comparing access to periodical articles in print and in microform. In the literature review of his report he points out that the “literature shows strong user resistance, with acceptance primarily by researchers who accept the need to use copies of rare materials not available in any other form” and that historians and archivists “continue to rely heavily on microform collections of documents, collections which are unlikely to be recopied into any digital format anytime soon.”

Sweetland recommends that “user’s cost-benefit and cost-value analysis” be included in any consideration of an information system. “No theoretical system, no matter how perfect, will be acceptable in the long run if the user has any options, and if the user finds other options of less cost and or more benefit.”

Sweetland’s comments reflect the increased emphasis on service in libraries.

Beginning in the 1980s, there were many studies and opinion articles on the advantages and disadvantages of microforms versus digital formats. At first the articles focused on which format was the most efficient and cost effective storage medium, microforms or electronic formats. It was not until the 1990s that research was conducted upon the differences between the two media for the user. These studies used CD-ROM as it was the prevalent digital format at the time, although the World Wide Web became the dominant electronic venue in the mid-1990s.
Smith compared the researcher’s ability to navigate various formats using four different formats of the *Times of London*. The digital format was compact disc which was “not a replication of the paper.” The study results are divided into “Physical Access” and “Intellectual Access.” Smith observes that “Because the microfilm is a photograph of a newspaper placed in sequence, page by page on a copy stand, the navigation aids of the film are nearly the same as those of the paper and also because the microform is a photograph of the original paper and …microform produced to archival standards is ‘permanent,’ …the photograph of the original paper is available for hundreds of years.” If a print out is made from film, the physical layout of the paper is reproduced. Smith mentions the differences in reproducing the physical format and all of the contents which microfilm allows, but digital versions only contain the text without many graphic features such as advertising. The tendency at that point in time was to digitize the “hard news” but not more popular or ephemeral elements. Navigation aids for microfilm were the printed, paper edition of the *Times* index and an online index. For the compact disc version there was indexing software on the disc accompanied by a 24 page printed user guide. The printed indexes were compiled by human indexers. The microfilm could be searched by using the indexes or by searching through the film. Smith concludes:

The *Times of London* provides an interesting example of dissimilarities in access that can result from publishing the information in different formats and the contrasts in results using different tools to gain intellectual access to the information. The information that is contained on the microfilm photograph of the *Times* is not the same information that is on the compact disc. It takes three different procedures to navigate through the three indexing systems, and a fourth procedure to navigate the full-text on microfilm.

Changes have since made electronic access easier as the full text is available and searched through the same software. A report from the Commission on Preservation and Access included differences in access between media.

Besides the physical inconvenience of using a machine to read microforms, another obstacle or type of access was bibliographic access—finding out what titles existed in what collections. We are fortunate to have a paper on bibliographic access by a noted authority, Professor Robert Holley from the School at Wayne State University.

**Preservation**

In the history of microforms, two main reasons for micropublication were the shrinking of vast amounts of mostly low-use materials and the preservation of scarce and/or fragile materials. While the major role of microforms at first was compressing information on paper for space saving, microforms were later regarded as a preservation medium as well. Perhaps, the most outstanding preservation feat for microforms is that of the microfilming of newspapers. Long considered by librarians and researchers to be the best, if not perfect or convenient, method of
preserving newspapers, the microfilming of newspapers came under attack at the end of the 20th century by Nicholson Baker, novelist, writer, and researcher. xxvi Baker’s allegations that the library and archival professions had destroyed countless original newspapers needlessly and his attack on microfilming instead of preserving originals were answered in the library/archival press and electronic discussion forums. xxvi The issue served to draw attention to the preservation of newspapers and sparked discussion about the role of libraries, archives, and museums in preservation of the cultural heritage. Collaboration between these institutions was suggested as a means of preventing the de-accessioning and trashing of original materials that Baker deplored. xxvii

Baker’s attack came during the 1990s when microforms were no longer being regarded as the perfect preservation medium and electronic formats had risen to the fore. It was not long, however, until the shortcomings of electronic formats were also seen. Swan outlines the differences between microforms and electronic media in “Micropermanence and Electronic Evanescence.” xxviii We are all familiar with the reasons advanced for microforms as the most permanent preservation media yet available. Swan outlines the issues with electronic media as a preservation medium: computer viruses, electrical storms and other electrical field disruptions, the ability to alter or destroy documents, centralization or concentration of storage and distribution capacity whereas the “micro environment is highly individualized, and there are countless separate pieces of hard and software spread abroad, just as in the worlds of paper publication.” Swan goes on to say, “We have to recognize that managing the information we need and must control entirely by putting it online is a dangerously one-sided approach. It denies values other than those of speed and access—among which are the values of durability, reliability and the patience that the past itself teaches. .. The urge to shift all of our documentary eggs into one computer basket must in itself be questioned.” xxix Some advocate CD-ROM as a more permanent medium for electronic storage not having the disadvantages of files stored on servers. Nonetheless, the obvious superiority of the electronic medium in terms of storage capacity and accessibility has led in recent years to an impatience with microforms.

Yet, libraries have invested heavily in microforms over a long period of time. Large quantities of printed materials were re-formatted to film media. Many millions of dollars worth of machinery and materials are in place and in use. (Recordak machines still in use.)

It is not possible to compile statistics on the universe of titles existing in microform. There are statistics of library holdings; figures from large micropublishers; bibliographic utilities; and government datasets. A few examples of very large collections in microform will serve to suggest the enormity of that universe.

· In 1988 British Library Document Supply Centre had 3,010,000 holdings in microform and microfiche other than reports comprised 300,000 items. xxx In 2004, the BLDSC held 4,400,000 reports in microform. xxxi
· OCLC National Newspaper Project Union list; OCLC microform records
· ERIC in 2004 has over 475,000 titles in the database excluding the journal article
citations. In early 21st century, ERIC began holding texts only in digital format.

NTIS added over 400,000 titles in the 1990s, the majority of these technical reports in microformat.

Academic and research library holdings constitute another source of data. The Association of Research Libraries (ARL) membership is U.S. and Canadian research libraries. In 2002, the median number of microform titles held by ARL libraries was 4,121,418. Collectively, the ARL libraries held 494,551,803 microform titles, but this figure of course includes overlap of the same titles held by multiple institutions. xxxii

The Association of College and Research Libraries compiles statistics for academic four-year institutions which are not members of the Association of Research Libraries. ACRL figures for 2001 are shown in Table I below.

It can be seen in Table I that the holdings for doctoral granting institutions far outnumber the holdings of institutions which do not grant doctoral degrees. This is hardly surprising. It can also be seen that of the non-ARL doctoral granting institutions in the ACRL data, the median for number of microform units is one-fourth the median of the ARL libraries, 1,042,156 to the ARL 4,121,418 median. While again, these figures represent multiple institutions holding the same titles, the figures do serve to illustrate the ubiquity of microform holdings and somewhat indicate the size of the universe of those existing materials. That microforms are also mainly used for research materials can be seen in the much higher number of holdings in the research libraries.

This universe of microform materials represents an historical commitment. And, of the vast wealth of sources available on microforms, many are available only in that format. Yerburgh has observed that “Unlike the new technologies, microforms have enjoyed a long history—one which has enabled a responsible level of standardization to evolve.” xxxiii In spite of being problematic, however, digitization projects for preservation and access continue to be inaugurated.

Migrations

Migration is a term used to describe the reformatting of materials or moving information from one format to a different format. The conversion of printed and original documents to microformats was a “migration” from paper, which was regarded as impermanent, to film which was regarded as permanent. Today the term migration is most often used to denote the conversion of print or microform texts to electronic files—the digitization of analog information files. Migration is usually for the purpose of making information available in a more convenient or permanent format. Digitization is touted as making information more available through the ability to key word search full text and preserving the information in electronic format.

The Association of Research Libraries (ARL) defines digitizing for preservation purposes as:

a) making duplicate copies that replaced deteriorated originals (e.g. by digitizing texts and
storing them permanently in electronic form and/or print them on alkaline paper.); b) making preservation master copies and thus guarding against irretrieval loss of unique originals (e.g. by making high-resolution electronic copies of photographs and storing them permanently and/or printing them; or c) making surrogate copies that can be retrieved and distributed easily, thereby improving access to information resources without exposing original materials to excessive handling.

ARL Statistics report that microfilming activity from 1988-89 through 2001-02 ranged from 60,502 volumes in 1988-89 to 88,170 in 2001-02. In between the rate of microfilming was up and down. There was an increase in 1995-96 to 173,646, then back to 155,805 the following year, another peak in 1998-99 of 191,348 and then back down to 87,531 (1999-2000) 62,039 the following year and then 88,170 in 2001-02. Although, preservation re-formatting by digitization has been an option for reporting in the ARL Preservation Statistics since 1996, there are as yet few institutions reporting. The microfilming statistics do show that although, microfilming may have diminished somewhat, it is still being utilized as a preservation option.

Migration of both print and microform texts to electronic files accelerated toward the end of the 20th century. Examples of recent migrations:

- JSTOR began as an effort to ease the increasing problems faced by libraries seeking to provide adequate stack space for the long runs of backfiles of scholarly journals. It was sponsored by the Andrew W. Mellon foundation in its pilot phases and was established as an independent not-for-profit organization in August 1995. The basic idea was to convert the back issues of paper journals into electronic formats that would allow savings in space while simultaneously improving access to journal content. When the contents of the journals are scanned, the images are linked as a searchable text file to the entire published record of a journal offering a level of access not possible with print or microform. JSTOR is becoming an indispensable resource for historical research, especially for those not located near research libraries likely to have the original runs of the journals.

- The Canadian institute for Historical Microreproductions (CIHM) had over 90,000 titles on more than 270,000 microfiche in the later 1990s in the Early Canadiana Research Collection. In 1999, a new project to move the project onto the Internet began with 3,000 titles. By 2003, the ECO had doubled in size and had usage of 15,000 pages read daily with over 2 million hits a month. Through this project, a comprehensive historical collection of original government publications, English and French, from the first colonial governments through Confederation and up to 1900 will be located, preserved and made available over the Internet, a total of 1.25 million pages!

- Lexis-Nexis acquired Congressional Information Service and University Publications in the mid 1990s. History Universe is a suite of electronic products which contain indexing and primary-source materials including the CIS indexing and microfiche editions of U.S.
government documents. The electronic *Guide to Microforms* indexes all of the CIS microform collections and the other collections acquired. Full-text of new sources are now electronic. Conversion of the entire U.S. Serial Set backfile, some 300,000 documents, was completed and the product is now only in digital format.

- Dissertations are now scanned and available as electronic files through UMI. Over 100,000 dissertations are available full-text. Other UMI microform series have been converted to electronic files. *Periodicals Contents Index* is an electronic database with more than 200 years of fully indexed articles from journals in the arts, humanities, and social sciences providing access to more than 10 million citations. It provides abstracting and indexing for 3,035 journals—from their inception to 1991. The overall dates of coverage are 1770-1991 with separate records for over 10 million journal articles. More than one million records are added each year. For many of the citations in the PCI, UMI’s *American Periodicals Series Online, 1741-1900* provides the full text. The American Periodicals series were microfilm projects begun in the 1970s: *American Periodicals I, 1741-1800*, and *American Periodicals II, 1800-1850*. The titles are now available full text in the APS Online which contains 89 journals published between 1740 and 1800 and 118 periodical published during the Civil War and Reconstruction. Many women’s and children’s magazines are contained in the collection. Because the database contains digitized images of the magazine pages, researchers can see the original typography, drawings, and layouts.

- The indexing of archival depository finding aids with the text of the finding aids in microfiche which was begun by Chadwyck-Healey for the United States and Great Britain was turned into an electronic project, *ArchivesUSA* by UMI/Proquest. In addition, the database also contains all the records from the Library of Congress *National Union Catalog of Manuscript Collections* discontinued in 1995 and several other archival directories.

- *Biography and Genealogy Master Index* and the Marquis *Who’s Who* titles have become electronic databases under the Gale Group *Biography Resource Center* effectively migrating over one million entries to electronic format.

In terms of reader acceptance, both microforms and electronic databases have one thing in common—they must both be read with a machine that has a screen display. And printing out the text is favored over reading long texts on the screen. There is an analogy here with printed books and e-books. Although the sale of e-books is increasing, the figures are increasing very slowly.xxxvii

There has been steady resistance to reading from machines or devices other than the handy format of the printed page. Bob Nardini’s description of resistance to e-books echoes some of the objections to microforms: “Librarians learned a lot about eBooks. Some things they learned were, that there weren’t very many of them, that the use model was restrictive, that they were not a bargain, that there were preservation questions, and above all that their patrons’ degree of
urgency about the need for eBooks was well below that of people in the industry.\textsuperscript{xxxviii} It seems that information professionals were more enthusiastic about e-books than their clientele. Unlike microforms, in which users could seldom obtain the materials in original format, e-books have largely been an additional format and not the only format materials in which materials are available.

Migration from microformats to electronic media is just one category of re-formatting. Software has been developed to scan microfilm and convert the text to electronic files. In fact, ironically, migration to microform is now being suggested as a preservation alternative for information which is born electronic.

The first three papers have presented aspects of the history of microforms with some attention to the future. Our last paper concerns the future of microforms in the digital age.

**References:**


iii. Ibid., p. 3-4.

iv. Ibid., p. 4.

v. Ibid., p. 4-5.


x. Ibid., p.198.


xix. Ibid., p. 133.

xx. Ibid., p. 136.


xxii. Ibid., p.33.

xxiii. Ibid., p.35.


xxix. Ibid., p.82.


xxxv. Ibid., p.12.


xxxvii. OeB, the Open eBook Forum reported the total number of eBooks published in Q3, 2003 was 2,159, a 74% increase over the same period in 2002 which was 1,241. Compared to printed books these are very low figures.<http://www.openebook.org/pressroom/pressrelease/q303stats.htm> (9 September 2004)


Table 1

**ACRL Library Data 2001**
**Survey Question #8 Microform Collections**
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