https://doi.org/10.2352/issn.2168-3204.2018.1.0.6

Digital vs. Analogous Long Term Preservation Microfilm still alive…?

Michael Luetgen; Sales Director Software, Zeutschel, Tuebingen, Germany

About this paper

The microfilm as a medium for long term preservation is still alive. Especially in the archives the microfilm is part of their strategies. But also libraries are using microfilm until today - although it's not a user friendly media type and access to information is very limited and uncomfortable.

The goal of this paper is to give an overview about the current status of analogous technology and analogous Long Term Preservation (examples, standards and tendencies), current status of digital Long Term Preservation, analogous equipment, risk management, cost comparison digital vs. analogous, resume and practical hints.

This paper will use experiences mostly from German examples but also international experiences from point of view of a vendor.

Current status of analogous Long Term Preservation

Microfilm is still in usage and part of the long term preservation in many countries. Although it's not a medium for modern information government and institution's strategies are still using analogous technology.

In Germany the State Archives and the National Archive supporting photo studios for their microfilming. Every State Archive has microfilm cameras and producing analogous images to deliver them for the long term preservation to the "Barbara-Stollen" in Southwest Germany. This is an old silver mine in a mountain which is managed by the German Government Office: Federal Office of Civil Protection and Disaster Assistance (BBK).

Also Libraries (State Libraries and National Libraries) are delivering microfilm to the "Barbara Stollen". The procedures in the libraries for the production of images changed in the last years and the digital long term preservation became more important.

This situation we find in many countries. Switzerland has very similar procedures and is using an old mine for the long term preservation of microfilm too.

Over all the microfilming is still a daily business in the culture heritage for the long term preservation.

Microfilming we see in the private industry also – especially in Pharmacy and Chemistry it's necessary because of Patent laws procedures and legal evidence.

Current status of analogous Long Term Preservation - Standards

International Microfilm standards are well established. On the ISO pages "https://www.iso.org/obp/ui/#home" it's simple to find all relevant standards. There is another nice compilation of standards by Laurie Varendorff on "http://www.microfilm.net.au/useful-info/microfilm-standards/".

Also national standards and guidelines are well established. In most countries in the archives and libraries these standards are supported and well accepted.

The standards are helping the industry to develop and produce the appropriated cameras, films, archive writers and reader devices.

These kinds of standards are still less in the digital environment.

Analogous Equipment

a) Pure Analogous Equipment

What is the situation with the needed tools for analogous preservation?

Production of Microfilm Cameras today is a decreasing business. The market offers are really thin. A look in the Internet shows us that there are not many suppliers. For Zeutschel I can say we are producing, every year, a small number of devices. But comparison of products becomes more difficult every year.

For Microfilm we still have vendors: Kodak/Agfa and Fuji. But only b/w film. The color microfilm died some years ago.

Reader Printers or similar Reading Devices are not available any longer. Support of the old devices has more or less stopped.

Processors and Chemistry is still available. But in some cases it becomes problematic because of pollution. We learned from Service Bureaus that disposal of the used chemistry became more difficult and that disposal cost becomes more expensive.

b) Analogous/Digital combined Equipment

Archive Writers had become more popular then cameras the last 15 years. Today in many places institutions do scanning and bring the scanned images back on a microfilm. This procedure enables archives and libraries to use the images combined with metadata to give public or limited direct access to the information.

Microfilm Scanners are used in the archives in two ways:

-> Self-service scanners for users to replace reader printer and others

-> Professional devices for the mass digitization.

Bits on Film is a way to record a digital object both as image (readable to the human eye) and as bit-stream (bits-on-film, computer-readable). For this method special scan equipment is needed.

Analogous Equipment – market tendencies

What can we see by our Zeutschel experiences from the different markets around the world?

Zeutschel sells Microfilm Cameras mostly to Russia and Eastern Europe. In other regions we have additionally replacement

business. But all in all these are not significant numbers of devices and revenues.

The number 1 market for Archive Writers is China. Also in Scandinavia we can find a significant number of devices. Many Service Bureaus are having Archive Writers and offering this service.

Microfilm Scanners we find today all around the world in archives and libraries. This is a settled procedure. Institutions are using these machines for the fast scanning in mass digitization – especially for newspaper scanning from microfilm.

Experiences from other companies are similar.

Current status of analogous Long Term Preservation - tendencies, strategies

Why are institutions still investing in the analogous technology?

The German example:

Germany preserves all cultural goods in the old mine - Barbara Stollen – on microfilm. All State- and National Archives and State- and National Libraries are producing and delivering. Today the source to produce is not only microfilm cameras but also scanners. Scanned material will be produced on microfilm (Archive Writer).

An extended strategy we can see in China.

The production of images is mostly with scanners (only a small number of cameras are in use). So the microfilm comes from Archive Writers. The result is to have the digital images for the information access and the microfilm for the long term preservation. In that sense the microfilm is like an insurance. Scanning from microfilm is much cheaper as from the original. In case of a digital collapse re-scanning is an alternative. This strategy puts the digital production on the highest priority to fulfill the users' needs and requirements.

Risk Management - Where are the risks in the analogous technology?

The big risk today is the needed equipment for analogous production.

Microfilm cameras are a shrinking market. The vendors are revenue and profit driven. As long as they can sell devices they produce. But the worldwide total numbers of needed analogous devices per year decreases. So an end of its production can be seen at the horizon.

With the production of microfilm it's the same situation. As I said color microfilm production stopped already. No vendor will give a guarantee for delivering film for the next generations.

Another problem is that we are losing the knowledge and experience by photographers and other experts in the analogous environment. Today the focus is digital.

Pollution becomes more and more a problem. Chemistry removal is more controlled and expensive.

Finally never forget the users. Access to information is the most important thing. The microfilm is definitely not a media type for users!

Cost Comparison

To find numbers and comparisons of cost for digital and analogous long term preservation is difficult. We all know that digital long term preservation is more expensive. NARA has on their homepage a nice summary:

"In an era of digitization, NARA continues to microfilm records because microfilm is a low-cost, reliable, long-term, **standardized** image storage medium. The equipment needed to view microfilm images is simple, consisting of light and magnification. The medium has a life-expectancy of hundreds of years. Digital images, on the other hand, consist of a wide variety of machine codes that require computer hardware and software to be made visible. To avoid the obsolescence of changing computer technology, digital images must be reformatted periodically. The **cost of maintaining microfilm is small** compared with that of digital images. Microfilm only needs shelving in a cool, dry place for a very long period of time." End of citation: https://www.archives.gov/preservation/formats/microfilming.html

An interesting comparison from 2010 I found from Jan Ferrari, Director of State and Local Records Management and State Records Administrator of the Texas State Library and Archives Commission:

Table: Cost Comparisons of 1,000,000 Images Kept for 50 Years

Media	Equivalent	Unit price monthly	Annual Storage	Filming/ Scanning	Total storage for 50 years	Grand Total
Microfilm	400 reels	$.04/reel	$192.00	$42,379.50	$9,600.00	$51,979.50
Paper	500 cubic feet	$.198/cf	$1,188.00	none	$59,440.00	$59,440.00
Digital 1	50 gigabytes	$24.00/GB	$1,200.00	$87,000.00	$60,000.00	$147,000.00
Digital 2	1,000,000 images	$.00064/each	$7,680.00	$87,000.00	$384,000.00	$471,000.00

These equivalents were calculated based on: 2,000 single-sided 8.5"x11" sheets per cubic foot; 2,500 images per microfilm reel (16mm -100' – 24X); 2,000 pages = 100 megabytes; Microfilm storage box = 3.75"x3.75"x1" = .003742 cubic feet each; 400 microfilm storage boxes = 1.5 cubic feet

Assumptions: Paper storage, microfilm storage, and microfilming with silver duplicate at State Records Center prices; Digital 1 and Digital 2 is imaging only at $.087/each at 600 dpi (does not include custom setup, indexing, document preparation, OCR, and other items that may be needed for a full imaging project); Digital 1 storage on state contract (does not include backup copies, future migration, media refresh); Digital 2 storage on state contract for image repository hosting

Texas Record / October 25, 2010

By Jan Ferrari, Director of State and Local Records Management and State Records Administrator

(https://www.tsl.texas.gov/slrm/blog/2010/10/why-do-we-still-need-microfilm/)

Jan Ferrari summarized: "The reason microfilm was important in the first place was as a *preservation* tool for recorded history. A microfilm image of a newspaper or an historic map, for example, preserves that image for estimates of over 500 years, and is therefore quite stable and enduring. It is a simple, usable tool for future generations that can be used in tandem with other media. Microfilm can be digitized for ease of access, and digitized images can also be microfilmed. It is truly the best format to protect our history."

It would be important to have more and new comparisons and cost analysis like this. It is not a vote against digitization and simple access to information. But it's important to understand the cost in a realistic way and to find the right strategy for long term preservation.

Practical hints…

Microfilm is not a suitable users' medium! People today expect access to information from their PCs. I remember a student I explained the usage of a microfilm. His resume was: "Am I in a library or a museum?"

For the strategy the goals are important. If information access is your highest priority no alternative to digitization! BUT: the microfilm can be your insurance.

Provocation: Maybe new scanning from microfilm – in case of a digital crash – is cheaper than supporting a complete digital long term preservation environment…

If long term preservation is your highest priority and access is unimportant (what I cannot imagine) microfilm could be an alternative still today. Scanning from microfilm can be done on demand…

Don't underestimate the equipment risk and the dependency to vendors. A strategy without digital options doesn't make sense. In digital environments the private industry will develop and invest – in analogous it's a big question mark.

Finally I like to give a political statement. Political aspects I didn't reflect. This is a wide field but we are all related to government will to invest the needed budgets. So of course it's important to take political argumentation into consideration.

I like to finish with a sentence Dr. Michael Hollmann the Director of the German National Archive said in a podium discussion 2016 in Berlin: "Inheriting always involves two: one who has something to inherit and one who wants to inherit something."

Author Biography

Michael Luetgen received his Diploma in Librarianship in 1980 from the Hamburg University. He worked for 10 years in Public Libraries. In the 90th he moved to the private industry. He was Managing Director of Ex Libris Germany (Software Company specialized for libraries) and Herrmann und Kraemer (Service Bureau). Today he is responsible for the Software Solution Sales in Zeutschel. .He is active in the IFLA News Media Group and a member of Kitodo Association Board.