

Preservation roles of reformatting: today, tomorrow, and the next day

Colin Webb, Director of Preservation Services, National Library of Australia

Greetings. What a pleasure it is to be here this afternoon. I am very grateful for the invitation to be part of this meeting, and to have the opportunity to meet with so many preservation colleagues from so many places. I wish to express my congratulations and thanks to the staff of the National Diet Library for their welcome and hospitality. This is the second time I have visited your country and your wonderful National Library. Unfortunately this will be a very short visit before many of us travel to Seoul for the IFLA World information Congress, but as with my previous visit in 1998, I will take many vivid and pleasant memories away with me.

And so to my paper: *Preservation roles of reformatting: today, tomorrow, and the next day*. Why this title? I chose it for two reasons. Firstly, because time is such a critical factor in preservation reformatting programs – if the copies we make will not survive, and be useful, over time their preservation role is limited.

Secondly, the title of my paper is meant to suggest something about the timing of our decisions regarding the reformatting option we want to choose. As I want to suggest to you, we may make one decision today, and a different decision later. Or we may decide today to do something different in the near future, without necessarily having to make the change right now.

So, today, tomorrow, or the next day.

In this presentation, I will probably say many things you already know, some of which may have already been discussed here; I will probably say some things that you might not agree with; you might even think what I am talking about is unimportant. If so, I apologise. However, what I am going to talk about is of great topical interest in Australia, where we are increasingly asking ourselves about the preservation roles of microfilming and digitisation as reformatting options. In the past, this questioning has been confined to what we might call the preservation community, who have generally decided that the only preservation reformatting option they could accept was microfilming. Over the past couple of years, however, this discussion has moved out of our preservation departments, and into our corporate board rooms; even into our Ministerial and Cabinet offices, as governments are being asked to consider proposals to allocate funds to large digitisation programs. Will this preserve your collections, they ask, as well as making them more widely accessible? What are we to say when they ask this question?

There are voices that say: “No! Digitisation is not a preservation measure. It is too unreliable for long term preservation.” At the same time, there are voices that say: “If you give us this funding for digitisation, it will meet all of our preservation needs.” And there are voices that say: “This is not the only thing we need to do to preserve our collections, but it will be an important part of our preservation strategy.”

As a preservation professional, where should my voice be? As a manager responsible for policy decisions in a major public institution, what advice and direction should I give?

As I have already said, I apologise if this is of no interest to you. However, if you are thinking about similar questions, I hope that what follows may contain something of interest, even if it is only some of the thought processes we are going through in my country, and amongst some of our neighbours.

Background

Reformatting information has a long history, ever since humans realised that copying was some kind of hedge against the ravages of time. Not infallible, not immune from errors and distortions, not forever – but a chance of continuity against the certainty of loss.

By the middle of the 20th century, the technology and the idea of using microfilm were well in place. By filming in certain ways, we believed we could capture enough information to satisfy the needs of users, and by rigorously and consistently applying certain controls and standards, we believed we could make the copies last for a very long time.

This is a great model. It has served us well, especially when we think about the threats to the survival of information in so many places in our world. So, please do not assume that I wish to take a critical stance towards microfilming because of some of the things I will be saying. I think preservation microfilming programs have often done a wonderful job for vast amounts of documentary materials that might otherwise have been lost.

But it is obvious that at least two developments are leading to a very serious challenge to the previously unquestioned role that was held by microfilming for the past 30, or 40, or 50 years.

1. Very obviously, we have the development of increasingly sophisticated digital technology for capturing, organising and presenting content rapidly and almost universally, so there is an attractive alternative to microfilm; and
2. Perhaps less obviously, the increasing cost and difficulties of relying on microfilming as a wholly adequate preservation and access medium are causing people to look at the alternative.

These developments may, or may not, add up to good reasons to dump microfilming in favour of digital reformatting, but they do suggest it is time to consider trends and where they might be leading us – if not today, then perhaps tomorrow; if not tomorrow, then the day after.

I want to tell you how we are thinking about these issues in Australia.

Some issues

1. Preservation support roles

I need to start by clarifying one issue: I am not talking about the potential of digitisation or microfilming to divert the wear and tear of use away from ‘original’ collection materials. I don’t think there is any debate on this subject. However, I see this as a ‘preservation support’ role. I want to focus on what I see as the core preservation role of reformatting, which is to provide an adequate copy that will ensure the survival of information even if the original

format should not survive. And, of course, this is where the debate about microfilming and digitisation lies.

2. Preservation potential of digital copies

Can digital copies play an adequate preservation surrogacy role similar to that currently expected of microfilm?

From long, global experience with preservation reformatting, it seems reasonable to postulate criteria for “preservation copies”. To be considered suitable, all of the following must be achieved:

- Copies must have “integrity” or “fidelity”: they must adequately capture the significant properties or key valued characteristics of the source material; **and**
- Copying processes must not present an unacceptable risk of damage to the source materials; **and**
- Copies must be long lasting; **and**
- Copies themselves must be capable of being used to generate further copies in the same or other formats.

Digital copies can surely meet all of these criteria, at least at a theoretical level:

- Digital copies can capture at least as much significant detail as microfilm, whether the comparison is based on bitonal, greyscale, or full colour capture;
- Digital copying can be done efficiently from either paper copies or microfilm at a very low level of risk, or at least similar levels of risk as for microfilming;
- Digital copies can be long lasting. Unlike microfilm, the longevity of digital copies depends on repeated archival data management practices aimed at preserving accessibility, rather than on archival storage of a stable object as with microfilm. At a theoretical level, there is no reason why the information content of digital copies, so managed, cannot have as long a life as a high quality microfilm copy;
- Digital copies that are being managed for preservation should be useable for generating derivative copies using current digital technology, and also for migrating to new copy formats as they are required over time.

Most objections to the use of digital copies as preservation masters refer to the difficulty of maintaining access over time. However, I believe preserving access to digital copies should not present great complexity. Program managers who specify well-standardised, widely-used losslessly-compressed image formats, with good metadata, should have a large but reasonably straightforward task to maintain reliable access through format migration, or some other available approach, applicable for batch processing.

Without trivialising the challenges of providing secure long-term data storage and management, maintaining large collections of well documented image files should be at the easier end of the digital preservation challenges that collecting institutions will have to manage over the coming decades and centuries.

This discussion suggests that, at least in theory, there is no reason why digital copies should not serve perfectly well as preservation master copies, if we want them to and are willing to commit the resources to looking after them.

However, a number of practical considerations may constrain this potential – considerations relevant to those of us concerned with real investments and real responsibilities. Three practical challenges in particular stand out:

1. The cost of high fidelity capture may be greater for digital copies than for microfilm. Scanning in colour is expensive because of the increased scan times and the file sizes that must be processed, transmitted, stored, etc. On the other hand, preservation managers have long accepted greyscale microfilm images as an adequate reproduction of much information content, so we are already used to some compromises in fidelity.
2. High resolution digital images tend to be large files. While we are used to hearing that computer storage is inexpensive, the cost of storing hundreds of thousands or millions of large, uncompressed digital files is significant - significant enough to lead to consideration of more compressed formats for archival storage. Some of us would probably reject such a compromise at the present time. On the other hand, it is quite possible that further development will make us more willing to use formats such as JPEG 2000 for preservation masters.
3. Committing to long term preservation of very large digital collections may be beyond the realistic capacity of some collecting institutions for the foreseeable future. Without being too precious about it, digital copies will only work as preservation masters if long term requirements can be met by some means or other.

This suggests that a decision to shift to digital copies as preservation masters must be accompanied by a commitment to establish an appropriate digital preservation plan.

3. For how long can microfilm be considered to be an adequate preservation copy?

If we look now at microfilming, we must ask ourselves; for how long can microfilm continue to work as a preservation copy?

There is no current question about the preservation usefulness of well produced and well maintained microfilm. However, putting aside the issue of poorly made microfilm - which cannot serve any adequate preservation role - are there circumstances in which microfilm might cease to be a viable preservation reformatting medium?

Microfilm is potentially subject to a number of scenarios that would seriously threaten its continued viability. For example:

- Withdrawal of suitable microfilming bureau services from the market place would impact on programs that rely on outsourced service providers.
- Withdrawal of suitable film stock from the market would impact on filming everywhere.
- Greatly increased costs of microfilming would have an impact on most programs.
- Withdrawal of industry support for access technologies such as film readers and printers, or greatly increased costs for replacing or maintaining such equipment, would impact on the use of microfilm for access and ultimately on its viability for preservation.
- Withdrawal of suitable microfilm storage facilities would impact on the preservation role of existing microfilm.

In Australia it seems likely that existing storage facilities for microfilm masters will continue to be available. However, we are unlikely to see any significant expansion of archival microfilm storage space because of the costs involved and the competition for resources.

It is very difficult to predict when industry support for future microfilming will disappear. The timing and impact of industry withdrawal is likely to be experienced differently in different places. For example, in-house operations may be able to continue until film stocks are no longer available, whereas commercial bureaux may make a much earlier commercially-driven decision to get out of the market.

The access end of the equation may strike microfilming down sooner, as the costs of providing and maintaining readers and printers continue to rise. A future in which we are dependent on a few difficult-to-maintain machines for access is just as frightening as the prospect of having to manage digital preservation programs. Personally, I have always considered the argument that “all we need is a magnifying glass” to be unconvincing if we are thinking about real access, or real future copying of information from microfilm. Possible, but not necessarily practical.

This discussion suggests that, at some time in the future, it is likely microfilm will cease to be an effective preservation medium. However, it is still completely unclear whether this situation will arise in the next 5, 10, 20, or 50 years, and we must consider the likelihood that it will happen in stages, at different times in different places.

What is certain, is that over similar timeframes more and more information content will be captured and delivered digitally, to service a growing demand for digital access, whether it has already been microfilmed or not.

So far we have been looking at the current and prospective adequacy of digital copying and microfilming to produce preservation masters. Between these two alternatives, we need to consider the question of:

4. When might digital copies become not just an acceptable, but the preferred preservation medium for capturing and retaining information content?

There are likely to be two ways of approaching this question:

- i. At a theoretical level, it seems likely the answer will be determined by economic and workflow factors, and by a demonstration of feasible and affordable preservation arrangements for digital copies. Looking at the economic argument, it still seems to be less expensive to microfilm collections than to make digital copies, although this partly relates to the significant costs of the value-added elements that make digital copies so attractive for users.
- ii. At a practical level, it is hard to avoid the conclusion that digitisation is almost certainly going to happen anyway, so microfilming becomes an added cost, which suggests it will not be long before the need for microfilming is vigorously challenged. At the same time, because the cost of digitisation remains relatively high, some collection materials will remain at risk of loss while they wait to be captured. Furthermore, this situation is exacerbated by the fact that many digitisation programs focus initially on materials in high demand, which are likely

to have already been microfilmed. So in the short term, a decision to put aside microfilming often means that no preservation-driven reformatting will happen for some years, while digitisation is catching up with what are seen as short-term access priorities.

This discussion suggests that institutions could decide to continue microfilming at-risk materials, while remaining open minded about the longer term preservation prospects of a digitisation program that goes beyond short-term access priorities.

However, it is possible to propose an alternative view that digitisation is already such an attractive reformatting option even for preservation purposes that it should replace microfilming now. In order to ensure highly at-risk materials are not allowed to deteriorate further before capture, current microfilming budgets could be re-directed towards digitisation, and consideration could be given to directing some digitisation resources to capturing preservation-needy collections rather than already microfilmed materials in high demand.

Some case studies

I now want to look at how these various considerations are being played out in four different contexts in Australia and the Pacific. (I must say that I have fictionalised some of these case studies slightly!)

A. National Library of Australia

The National Library of Australia has been microfilming for preservation purposes since the 1950s, but most of our microfilming effort has been since the late 1980s. All of our microfilm is produced by external bureaux to specifications prepared and checked by our Preservation staff. On the other hand, the Library has been digitising collection materials since the mid-1990s, but large scale digitisation only began as a continuous program in about 2000.

How does this program stand up against the criteria for preservation masters? We have a Digitisation Policy which commits us to capturing full details, and capturing once only. There are some internal arguments about cropping, but for highly significant items there is no dispute – they are captured in full.

Our copies will be long lasting – we use “archival” file formats, we record good preservation metadata, we store digital files as preservation masters and produce derivative copies for manipulation and use; we store our preservation masters as business critical collections receiving best practice data storage and backup, and we will migrate them to new archival file formats when we need to.

Managed this way, I also have no doubt that we will be able to generate further copies as needed for a wide range of uses, and as needs change over time.

All of this means that for the NLA there is good reason to believe digitisation can achieve our preservation reformatting objectives, and do it as well as, or better than, microfilming does. Like all preservation reformatting programs, we do need to make sure the Library's policy is consistently implemented, but this applies whether we are microfilming or digitising.

Will we continue to microfilm? In general, I would expect that within the next 12 months to two years, we will virtually stop microfilming - not because we think it is already a dead technology, but because everything we want to microfilm we also want to digitise. Given that we believe we can manage the long term maintenance of our digital copies, it is hard to justify the costs of microfilming and managing microfilm in addition to the costs of digitisation. We will continue to store and look after the microfilm we already have, but I would be surprised if we will add substantially to our stock of new filming.

B. Small State Library in Australia

The second scenario I want to put before you, for comparative purposes, is a middle-sized State Library in Australia, which is about half the size of the National Library. This Library has its own in-house microfilming unit, for which they have made large investments in equipment for filming, and in staff training. The small amount of digitisation they have undertaken is mainly aimed at showcasing some of their most treasured items. This State Library is a strong advocate of the need to continue microfilming for preservation purposes, and is unwilling to consider digital copying as a preservation reformatting strategy, unless it is also supported by parallel microfilming.

I think this is a sensible conclusion for them to have reached, at least for the present time. Their collection is large, but their Information Technology infrastructure has little capacity to build a reliable digital repository or to put in place the kind of digital preservation program that could guarantee ongoing maintenance of their digital files. This organisation will probably reconsider their position when it comes time to replace their expensive microfilming equipment, or if someone else, such as the National Library, is able to offer a trustworthy centralised repository for their digital collections.

C. Remote historical society in regional Australia

The third scenario for comparison is a very small historical society in a remote country town in regional Australia. This group holds an interesting collection of local memorabilia, including locally produced newspapers from the 19th century that are sources of great local interest and pride. The historical society consists of no more than 20 volunteers, stores its collection in one old stone building with no air conditioning, and owns a single PC. The society is very anxious to preserve their local newspapers and to make them available to the local community.

There is no way such an organisation can organise their own microfilming **or** digitisation program, but a copy centre in a town 50 kilometres away does offer to put the newspapers onto a flat bed scanner and load the digital images onto CDs for them, if the National Library will provide funding.

The funding requested is relatively small. The local interest is great. The chances of the newspapers surviving are poor if they are not copied soon. Should we include the newspapers in our own microfilming program? There are three problems with doing this: firstly, we have many, many other more important newspapers to copy before these, so it would take some years before we could copy them. Secondly, supplying the historical society with a microfilm copy will hardly help them at all, as they cannot afford to buy a microfilm reader. And thirdly, I have just noted that we intend to discontinue microfilming ourselves!

In these circumstances, there seem to be two sensible paths. One option would be to provide the funding to have the newspapers copied digitally, but also to provide detailed guidelines on handling and preparation of the material, along with specifications for file formats and resolution levels, and templates for setting up a database of files and a user interface. We should also help the historical society in finding a safe repository to manage the digital files on their behalf.

The other sensible option would be to provide funding for microfilming by a reputable bureau, and digitisation from the microfilm to provide access copies that the historical society and its patrons can use. This would cost us more but provide them with greater security.

A third option, and in fact what is likely to happen, is for the historical society to give up waiting for us to help them, and simply go ahead and have the scanning done using their own resources. They will make one copy of each file, burn it to CD and make a few spare copies for local sale. In the process, some of the newspapers will suffer minor damage and some of the scanning will be done poorly – but they will have copies they can use for a few years until their cheap CD-Rs become fail or they buy a new PC with a different operating system and find their CDs no longer work.

Is this a disaster? Probably not, but it will be a loss. A loss of some information; a waste of some money; perhaps a lost opportunity. But much of the paper copy will survive and be able to be scanned again at a later date, at a time when hopefully, we may have a better organised way of helping such organisations.

D. Pacific Manuscripts Bureau

Finally, I want to consider the situation of small island states in the Pacific, many of whom rely on an organisation called the Pacific Manuscripts Bureau to copy records relating to the Pacific, including records of business organisations with operations in the region. These records are critically important in documenting land ownership, as well as family and community histories.

The Pacific Manuscripts Bureau is a consortium of nine libraries in Australia, the United States and the Pacific which has been microfilming Pacific records and manuscripts for the past 40 years. In most cases, filming is carried out by Australian staff of the Bureau in conjunction with local operators trained to use the field cameras carried by the Bureau staff.

The microfilm masters are stored by the National Library of Australia, but they do not always comply with international standards.

The PMB has recently considered the question of moving to digitisation in place of microfilm. There is strong partner interest in making this move but also strong resistance. Partner libraries in Australia and the US, and in some Pacific states have invested in microfilm reader technology and are keen to keep using it. On the other hand, microfilm readers and printers are becoming too expensive for many Pacific organisations to maintain or replace, whereas most have ready access to computers. Many Pacific partners and information owners are also keen to move to digitisation because they believe it would put more control back into their own hands.

I have a lot of sympathy with these views, especially in an environment where it is possible to back up their local digital files with mirror copies stored elsewhere under formal agreements which protect both the privacy of the people involved and the security of their information.

Such arrangements do not currently exist for digital preservation masters, but we have been able to negotiate similar arrangements for microfilm, so it should be possible to strike something suitable and reliable for digital copies.

In this context, I believe the future prospects of digital copying in this region are good, even though most Pacific states do not have the necessary IT infrastructure for long-term digital management. However, for the present microfilming is likely to continue, despite the difficulties of storing film without adequate climate control, and difficulties in maintaining access through aging microfilm readers.

From these case studies, it appears that one of the best things we could be doing, rather than arguing about the future of microfilming, would be to get on with the job of building reliable digital repositories and what is needed to preserve what they store,

5. Going beyond “either/or” perspectives

This discussion suggests that libraries are likely to live with a mix of preservation approaches for the foreseeable future, possibly including:

- Some who may be willing to rely on their digital preservation arrangements to ensure that digital copies can serve as preservation masters. These libraries are still likely to maintain their existing microfilm copies for some time, and may continue to produce small amounts of new film because their digitisation programs cannot address all of their preservation imperatives quickly enough.
- Some libraries who may continue to rely on microfilming for their preservation reformatting needs, whilst also supporting digitisation for its access benefits.
- Some libraries who may continue to rely totally on microfilming because they have insufficient capacity to manage digital capture or digital preservation programs.
- Some libraries who decide to keep on exploring all possibilities.

Some leading/ leaving questions

I began with a thanks and an apology. I feel I should also end the same way. I have not offered you any firm answers or conclusions about whether we should chose microfilming or digitisation as the preferred preservation reformatting strategy. I assume we will continue to ponder this, and I assume people will make pragmatic decisions about what they can afford, what they feel competent to manage, and what their clients want. I suspect we will each find our own answer by deeply thinking about two questions, which I will leave you with:

- Why would we abandon microfilming while ever we can do it?
- and
- Why would we pay to continue producing and storing microfilm when we are also paying to make digital copies and paying to keep them usable?

Thank you once again.