Information Overload

Issue 61, September 2007

Welcome:

Welcome to the September edition of Information Overload. A small piece in the July/August issue of Image and Data Manager (IDM) on the problems conservators and archivists are having with Iron Gall Ink prompted me to take a good look at the mediums we use to store our vital information on. Why the concern over Iron Gall Ink? Well the document that Australia's constitution was created used this popular ink of the time. The problem is that the ink is eating through the parchment.

We would like to thank you in advance for forwarding this edition onto friends, colleagues and other interested readers. Please note that all back issues of this edition, as well as our registrant resources edition can be read and/or downloaded from our web site – http://www.iea.com.au/web/Publications should any of the topics be of interest and use.

Lorraine Bradshaw
Marketing Coordinator and Projects Officer

In this Issue we will be looking at:

- Physical Mediums
  - Paper, paper everywhere
  - Thermal paper
  - Photocopies and printers
  - Ink
  - Sellotape, glue and other mediums for mending damaged items
- The Digital Side of Things
  - CD's as archival storage
  - DVD's, Blu Ray and the next generation
  - Thumb drives
- Mis-filing: Poor classification and indexing
- A Thought to ponder

Physical mediums:

When looking at the physical medium of information storage there are two distinct types we need to look at. The first of course is paper based, be it books, journals, scraps of envelopes and the typical A4 sheets bought in reams of 500 pieces from virtually any supermarket and general store.

The second type of physical medium we will be looking at are the (for want of a better word) cases that contain digital information, for example CD's, DVD's Thumb drives, Hard drives etc.

© IEA 2007. All rights reserved. You are free to use material from the Information Overload newsletter in whole or in part, as long as you include acknowledgement of source.

Information Enterprises Australia Pty Ltd
Unit 4, Upper Level, 201 High Street, FREMANTLE WA 6160
Tel: 08 9335 2533 Fax: 08 9335 2544 e-mail: training@iea.com.au

And of course the problems we have as information professionals in trying to maintain the container(s) so that the words, ideas and information that are stored within the container can be preserved.

Paper, paper everywhere:
The paper we use today is made by crushing wood pulp. This makes quite short fibres as opposed to the longer fibres created in the past by using cotton. Short fibres are more prone to breakage as the paper ages, and as you know this can occur quite rapidly if exposed to heat and light. Newspaper and mass produced paperback books are particularly prone to this kind of damage.

However, it is the chemicals that are added during the manufacturing process that can cause the biggest damage. Bleach is added to pulp to make the paper white, however, the primary source of acid in modern paper is the alum-rosin sizing agent introduced in the manufacturing process to prevent the ink and dyes from feathering. In the presence of moisture, the alum in the sizing agent generates sulfuric acid.

Thankfully there is an alternative to acid based papers, namely alkaline paper -- that is, paper that contains an alkaline reserve. This alkaline reserve, (most frequently chalk), neutralizes acids and also makes the paper look whiter. Like cotton papers, alkaline papers can last indefinitely. Acids formed within the papers or those absorbed from the environment are neutralized before they have a chance to degrade the cellulose chains. http://www.loc.gov/preserv/deterioratebrochure.html

Thermal paper:
Thermal paper is the kind used in cash registers, credit card terminals and parking ticket machines. The paper is impregnated with a chemical that changes colour when exposed to heat for example, when it is printed and you are given a copy "for your records.'

Which is all very well, but the chemicals within the paper are extremely unstable, especially if the paper is subjected to additional heat or light exposure, and deterioration can be exacerbated by close proximity of plastic coatings, or say for example you use a highlighter pen to mark the item on the receipt for the item you are claiming.

Sometimes it is hard to read these after 12 months – imagine having to produce them 5 years down the track if requested by the tax department. Yes we could always photocopy them – but then how do you prove that the now blank piece of paper that you attached to the photocopy actually says what you say it does.

Photocopies and printers:
Perhaps it is an obvious thing to state, but when looking at the issue of storing paper, it is not just the physical paper we need to take into consideration; rather it is what is imprinted onto the medium that makes a document important.

The physical durability of a printed copy depends largely on the quality of the paper used, and how well the toner adheres to it. Time, temperature, humidity and pressure appear to be the most important factors, but adhesion may also be affected by the surface finish and porosity of the paper. It is more difficult for dry toners to penetrate coated papers and papers with small pore sizes. Moisture content of the paper can be critical for the toner-to-paper transfer process and may also affect the fixing process.

© IEA 2007. All rights reserved. You are free to use material from the Information Overload newsletter in whole or in part, as long as you include acknowledgement of source.
Information Enterprises Australia Pty Ltd
Unit 4, Upper Level, 201 High Street, FREMANTLE WA 6160
Tel: 08 9335 2533 Fax: 08 9335 2544 e-mail: training@iea.com.au

Full-colour images are thicker than black toner images because they are composed of four layers of toner. Consequently, they do not fully adhere to the paper and are more prone to flaking during flexing or folding.

As with all things mechanical, it makes sense to ensure that regular maintenance occurs. This ensures that the optimum temperature for fusion is maintained. As far as archival quality is concerned, I have not found anything to suggest that a specific archival quality toner is available; rather the quality of the paper seems to be the important factor as to whether the document will last for however long it is required. However, as with all things there are the usual caveats.

Light, heat, rodents, bugs and air borne pollutants all damage paper based documents, as does chemicals and water and subsequent moulds should the document get wet. It is also wise not to place them in direct contact with PVC based materials due to the possibility that heat can transfer the images (inc words etc). But we will be looking at these in more detail further on.

Inks

The item of interest that started this paper was that of the iron gall ink that was used from the late Middle Ages through to the middle of the twentieth century. Iron gall ink is primarily made from tannin (most often extracted from galls), vitriol (iron sulfate), gum, and water. It was easily made, and the ingredients were inexpensive and readily available. Which is why the range of objects that contain iron gall ink is enormous. For example it can be found on manuscripts, music scores, drawings, letters, maps, and official documents such as wills, bookkeeping records, logs, real estate transactions, etc. More from http://www.knaw.nl/ecpa/ink/ink.html.

Iron-gall ink was very useful because it did not rub off documents. Unlike paper, parchment was not absorbent, so carbon-based ink easily rubbed away. Iron-gall ink ate into the parchment by reacting with collagen in the parchment, and with the cellulose in paper or papyrus. As time has passed, some of the early documents (including drawings, music scores etc) are now slowly being eaten away by the ink.
http://realscience.breckschool.org/upper/fruen/files/Enrichmentarticles/files/IronGallInk/IronGallInk.html

Sellotape, glue and other mediums for mending damaged items:

We can do more harm than good when we try and mend damaged books and paper. The biggest culprits are tapes and glues usually from cheap "sticky" tape. The chemicals within the tape react with the page and turn the page yellow. This yellowing is caused by the fibres within the paper breaking down. If you have ever used one of the old sticky photo albums you will know first-hand what we mean.

In removing the tape, you are usually left with a sticky residue which acts like fly paper, attracting air borne pollutants to the already damaged paper fibres. And if you want to clean up the pollutants and the residue you usually have to use solvents, which of course are usually toxic. More on the problems caused by tapes here - http://www.ashmolean.org/departments/conservation/deterioration/#paper

© IEA 2007. All rights reserved. You are free to use material from the Information Overload newsletter in whole or in part, as long as you include acknowledgement of source.

Information Enterprises Australia Pty Ltd
Unit 4, Upper Level, 201 High Street, FREMANTLE WA 6160
Tel: 08 9335 2533 Fax: 08 9335 2544 e-mail: training@iea.com.au

The Digital Side of Things:

At the New England Library Association conference in 2004, Steve Dalton, Director of Field Services, Northeast Document Conservation Center. He stated that from 1999, approximately 93% of new information produced is created in digital form. http://www.nelib.org/netsl/pastprograms/paperanddigitalpres.htm. Of course that figure is likely to be much higher now as the speed to technology increases.

As Margaret Hedstrom stated way back in 1998 "Digital information improves access to the material. BUT there is a big investment in software tools, and the cost of converting the material is largely based on the complexity of the transfer rather than the volume being converted. The more human intervention there is means there will be more costs involved."
Margaret Hedstrom: Rising to the Challenges of Digital Preservation
Free lecture given by Dr Margaret Hedstrom, Associate Professor at the School of Information, University of Michigan. 11th August 1998.

Whilst we have looked at the issue of digital archiving in previous editions, it is still worth noting that most (all?) digital material needs some form of carrier on which to view/listen to it.

The average lifespan of a website is just 44 days (see issue 19 of Information Overload) – and the content on those websites that do survive, changes constantly. With Web 2.0 and the social interaction websites such as Twitter, Facebook and Blogger, even sites such as Wikipedia and Yahoo Anzwers changes occur on what seems like a second-by-second basis.

Whilst these applications exist in cyberspace, and therefore not OUR problem as to whether or not the information will be lost, misplaced or deleted by accident or malicious intent, these are still records of our "business transactions" and it could be argued, treated as such, although most organisations are still trying to come to terms with the amount of emails that are generated in-house, let alone through outside carriers such as Yahoo and Gmail.

Rather we have to deal with the hardware and software that sits in our offices and homes, upgrades of either can be a nightmare, and please don't talk to me about system crashes. I've recently been upgraded at work – hmm – shades of cybermen spring to mind – but my new computer does not have a floppy drive in it any more. It has instead a DVD drive and burner capability and space for not one but two USB devices – be they sticks or external hard drives. I use both, it saves carrying my MP3 player around if I can simply upload my hard drive and play using a free version of a media player that doesn't convert files. Can you imagine taking your record player into work so you could listen to your vinyl collection? Amazing how fast the technology has changed. As it happened I had one of the very early discman's – I've still got it as a matter of fact, and whilst it cannot cope with MP3 formats it can still play most CD's and CD-R's. Gosh how I love to write jargon and expect you all to understand what I'm talking about. But I know that if I want to get a part for that early player I am going to have to look to the enthusiasts and the techies to solve my problem.

So what am I saying? Well the words, sounds and images that we want to preserve for prosperity (or to prove to someone that we did do what we say we did and when) have to be captured on to some kind of medium. Just like you cannot write on thin air, unless we preserve the medium we are not going to be able to view the message. Gone are the days when we could pass down our heritage through word of mouth – no-one sits still long

© IEA 2007. All rights reserved. You are free to use material from the Information Overload newsletter in whole or in part, as long as you include acknowledgement of source.
Information Enterprises Australia Pty Ltd
Unit 4, Upper Level, 201 High Street, FREMANTLE WA 6160
Tel: 08 9335 2533 Fax: 08 9335 2544 e-mail: training@iea.com.au

enough to listen, let alone learn and absorb. So we need to ensure that the medium we have chosen to preserve our thoughts, feelings, images, music, transactions etc can stand both the test of time and the test of progress. And whilst we as records and information managers, librarians and archivists know and understand the problems that come with making information (in whatever form) our business, it is trying to make others understand they have an important part to play in this game of capture that's the hardest part.

Unless people can see a need to preserve, they will willingly digitise the physical, and not concern themselves when after several upgrades they can no longer find or access the material.

In fact a rather interesting case in point came through the email list serv this morning – a person asked a question regarding what to do with the following:

- Private Company (PLC) has a backup of emails on Lotus Notes up until 2002.
- Over 75% are encrypted
- Encryption keys not available (lost/not handed over during de-merger of company)

Oops.

CD's as archival storage:

Developed by Philips and Sony in 1979, the Compact Disk has proven to be one of the most versatile, popular and enduring data storage mediums ever created. After years in development, the first disc (ABBA's The Visitors) rolled off the line at Phillips' factory just outside Hannover, Germany in 1982.

In 1980 Sony worked out the music CD specifications (Red Book), this was followed a few years later with its "Yellow Book" specification for computer data CD's.

Phillips claims that some 200 billion CD's have been sold to date (http://www.idm.net.au/storypages/storysearch.asp?id=8737). The question is as always, will the digital revolution and in particular peer-to-peer file sharing sound the final death knell for CD's as a medium on which music etc is recorded? And how will we cope with the huge amounts of data that has been recorded and retained on its metallic coated sides?

Perhaps one of the more interesting uses to which CD's have found a niche, is that of archiving vast quantities of data. With 25 years of history and development under its belt, the CD has the kind of longevity usually afforded to both tape and paper, although it does have a long way to catch up with both, as well as the more traditional long-term archival medium of microforms (fiche and film).

The problems with CD as an archival medium however are many, not least of which:

- The medium requires some form of viewer on which to read the contents. Namely a computer with some form of suitable software to read the variety of formats that we can generate on today's technology.
- There are no guarantees that the medium will stand long – term storage, even assuming the CD's are kept in climate controlled storage environments. Quite simply the technology has not been around long enough to test long-term longevity in a real-world environment. Tests carried out in laboratory conditions however, do seem to indicate that there will be a good chance that the discs will last as long as purported – however, I am not sure I would trust an accelerated aging process just

© IEA 2007. All rights reserved. You are free to use material from the Information Overload newsletter in whole or in part, as long as you include acknowledgement of source.

yet to preserve my vital records, so I shall still be migrating my information every few years – just in case.

- Where heat and humidity form a part of normal everyday environmental conditions, the protective layers can be breached – especially if the quality control through the manufacturing process is a little shoddy. Where the protective coatings fail CD-ROT eats away at the disc structure leaving the information stored nowhere to go!!
- Once damaged – it is very unlikely that you will be able to retrieve the data stored on the disc, especially if the damage involves breaking or cracking the disc. We asked a contact at Kodak after one of our own archival discs slipped out of the case, hit the safe wall and cracked. Lasers within the CD machines are simply not capable of reading "breaches".
- Not all CD's are created equal. There are many disc manufacturers who purport to manufacture Archival quality discs, however, numerous tests have indicated that even the gold layered discs are not manufactured to the same standard.
- The speed of writing/burning can and does have an effect on the eventual outcome.

DVD's, Blu Ray and the next generation:
And whilst we are on the subject of Discs. DVD's have become embroiled in the same developmental argument that hit the tape world. Which format of player do you opt for? Blu Ray or HD? In the tape world of course, VHS won the war over Betamax. With DVD's it is not quite so simple, as major money is being poured into both camps. However, with the arrival of cheaper external hard drives (mine is 60GB and is smaller than a piece of bread) why would I want to spend good money on a new burner when I can simply carry around an external hard drive? Of course that's just a personal decision, and with all things digital, the choice is yours whether to go with a disc that can be damaged, or a HDD that can crash and burn along with the best of them?

Thumb drives:
I was interested to find out that those useful little thumb drives that have virtually replaced the "floppy disc" almost overnight and without much of a whimper, have a limited number of "writes" before the memory is corrupted completely. You can re-format the drive once or twice, but even that (but correct me if I am wrong) does not extend the life of the driver for very long.

What is interesting to note is that the processing power contained in one of those little "do dads" is far bigger than my very first desktop computer. But all that aside, if you are relying on one of those little processors to store vital information, be prepared for its inevitable failure and instigate a backup and migration policy as you would with any other digital medium.

Mis-filing – poor classification and indexing:
One of the problems associated with both the "hard copy" document as well as its digital counterpart is what happens after the document (for want of a better word) has been created. Where do you file it, and what happens when you don't use a controlled format for doing so. For example, a document that is mis-filed is essentially lost. If you don't use some form of controlled vocabulary when you are assigning metadata to the item, you will struggle to find all the documents on a particular subject.

Ok, a for example: HR, Human Resources, Employees, Contractors, Personnel – which do you use? What may seem logical to you may not occur to someone else. So if you don't have a controlled vocabulary for your organisation I would strongly recommend that you use one.

© IEA 2007. All rights reserved. You are free to use material from the Information Overload newsletter in whole or in part, as long as you include acknowledgement of source.

The other thing I would strongly recommend that you do, is mirror your hardcopy filing with that of your digital files, that way you can be consistent with your filing and of course retrieval. Very important if you have a legal case pending that depends on it.

A Thought to Ponder:

"The Art of progress is to preserve order amid change."

Alfred North Whitehead, 1861-1947

Your comments and suggestions on the subject of this newsletter are most welcome. Or if you would like to see other issues covered in future editions, please email me at training@iea.com.au. Please feel free to pass on this newsletter to your colleagues' friends and associates. To subscribe they should send an e-mail to training@iea.com.au with "subscribe newsletter" in the subject line.

If you have any suggestions as to what should be included in future editions, then please send an email to training@iea..com.au. If you would prefer not to receive this newsletter, please send an email to training@iea.com.au with "unsubscribe newsletter" in the subject line.

© IEA 2007. All rights reserved. You are free to use material from the Information Overload newsletter in whole or in part, as long as you include acknowledgement of source.

Information Enterprises Australia Pty Ltd
Unit 4, Upper Level, 201 High Street, FREMANTLE WA 6160
Tel: 08 9335 2533 Fax: 08 9335 2544 e-mail: training@iea.com.au