

The Digitisation Centre:

**Monash University Library's digitisation service,
integration of e-reserve and access to digitised images.**

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Abstract:

This paper will describe the implementation of the Digitisation Centre within the Monash University Library. The Digitisation Centre purpose is to provide a centralised digitisation service creating digital copies of copyright protected works for educational purposes. The paper will discuss the operational and management issues involved in providing a centralized digitisation service in a university library environment.

1 Introduction

For several years Monash University Library has been providing a small electronic reserve collection at the Berwick campus library (Groenewegen, 1997). The copyright owners permission was always sought before the document was digitally copied. Identifying the copyright owner and then seeking written permission, negotiating fees and managing the records was a significant overhead that capped the growth of this electronic reserve collection. With the signing of the agreement between the Australian Vice Chancellors Committee (AVCC) and Copyright Agency Limited (CAL) in March 2000, allowing licensed digital reproduction in compliance with Part VB of the Australian Copyright of Act 1968, the library was in a position to significantly increase the size of the digital collection.

Library management realised that the nature of the new AVCC-CAL agreement allowed widespread digital copying throughout the various units of the university. If this were to happen it would become impossible to ensure that the university was in compliance with the agreement. To avoid this situation a strategy to recast the university library's electronic reserve scanning operations into a centralised digitisation service for the whole university was developed jointly with the Centre for Teaching and Learning Support (CeLTS). This strategy was approved by university management and became policy.

An overview of the operations and management of the digitisation service, the Digitisation Centre, is outlined in this paper. It covers the equipment used and the procedures developed to promptly process digitisation requests. The centre's operations are geared towards a fast processing time while still ensuring copyright compliance and reasonable quality output. Copyright management and access to the digital documents is provided by the library's cataloguing system, neatly reducing the records management overhead. The variety of material digitised, the problems encountered and their solutions are described. The Digitisation Centre shares resources with CeLTS' Print and Web Publishing Unit, allowing flexible learning and distance education material to go online in a format that is readily accessible to the students.

Overall the Digitisation Centre has successfully achieved the objective of supplying licensed digital reproductions to the university, and that the library is the appropriate organisation within the university to undertake this activity.

2 Overview

2.1 Reserve collections

The reserve collection is widely established practice in university libraries. Such collections consist of student texts and photocopies of articles from journals and chapters of books that have been recommended by teaching staff as undergraduate course reading materials. The reasons for setting up reserve collections were to ensure equitable access for all students to these important resources and to protect these materials from theft or vandalism (Groenewegen, 1998, p.1).

2.2 Copyright law and educational copying

Under Part VB of the Australian Copyright Act of 1968, universities can be granted statutory licences to reproduce copyright materials for educational purposes. These licences are subject to payment of remuneration to the copyright owners. The rate is determined by agreement between the universities and the Copyright Agency Limited, which is recognised by the Government as the representative of the copyright owners and is authorised to collect remuneration on their behalf. The amount payable by each university may be in part determined by counting and recording actual number of copies made, or may be arrived at by sampling. Failing agreement on a rate of remuneration between the universities and CAL, the rate will be set by the Copyright Tribunal.

The Copyright Act limits the amount of material that may be copied from any one work. For example for a monograph, there is a limit of one chapter or 10% of the total text, whichever is the greater. For a periodical, the limit is one article, unless all the articles copied relate to the same specific subject matter.

2.3 New CAL agreement for educational copying

In March 2000 the Australian Vice Chancellors Committee (AVCC) signed a new remuneration agreement with CAL on behalf of 29 universities, including Monash.

Key elements of the agreement are:

- The agreement will remain in force until 31 December 2002.
- For the first time the agreement covers digitisation as well as photocopying of copyright materials.
- The remuneration payable to CAL by universities is fixed for the duration of the agreement, i.e. the period 2000-2002.
- All participating universities agree that for the duration of the agreement they will operate under a sampling regime and not a record-keeping regime.

2.4 Issues raised by the new agreement

Although the new AVCC-CAL agreement represents a breakthrough on the legal position of digital reproductions, there are several issues that have to be considered:

- There is a risk of costly duplication of effort and resources if all areas of the university were to set up and operate their own digitisation facilities.
- AVCC has warned that open slather copying over the next three years will result in CAL requesting the Copyright Tribunal for substantially higher payments in the future years.
- There continues to be a risk of infringement, because of legal limits on the portion of works that may be photocopied or digitised. It will be necessary to demonstrate that any one person copying on the behalf of the university did not exceed these limits. In the case where several articles were copied from a single monograph or periodical, then it must be shown that these copies were made for different groups of students, undertaking different courses.

2.5 Centralised scanning service

After consultation between the library and CeLTS, the library proposed to the university administration that the following model should be set up to resolve these problems:

- Two digitisation centres would be established, one in the library at Clayton campus and one at the CeLTS Print and Web publication Unit at the Gippsland campus. These centres would handle the bulk of the digitisation work required for the university.
- Digital copies made in the university under the CAL agreement would be archived on a single server. Each would have a unique web address.
- All archived copies would be indexed in Voyager (the library's catalogue system) for retrieval under several index points.
- Teaching staff who wish to refer students to any document that had been archived simply include the appropriate hypertext link in their course material. Students would be able to access the document by clicking the link. Equally, students who were searching Voyager directly, perhaps with the Reserve module, can click on the hypertext link to retrieve the full text.
- Appropriate records would be kept of the use of these documents.

University management and the Committee of Deans agreed to the model and the Digitisation Centre was established. CeLTS management decided not to develop a digitisation centre at the Gippsland campus. They did not have the resources to establish their own digitisation centre and continue on with their core activities of supporting off campus flexible teaching. It was agreed that CeLTS and the university library would share digital resources.

3 Operations

3.1 The Centre

The Digitisation Centre is located on the second floor of the Sir Louis Matheson Library at the Clayton campus of Monash University.

3.2 Core Services

The Digitisation Centre processes the following categories of items:

1. Reasonable portions of copyrighted works copied and communicated under the remuneration agreement signed between CAL and the AVCC - **93% of all items processed in 2001.**
2. Lecture notes, slides and other teaching resources for which Monash University holds copyright - **5% of all items processed.**
3. Monash exam papers - **1% of all items processed.**
4. Copyrighted works where the copyright owner has granted permission for Monash to digitally reproduce and communicate their works - **1% of all items processed.**

From time to time the Digitisation Centre scans or converts internal library documents and publications into digital format.

3.3 Resources

3.3.1 Staffing

The Digitisation Centre has been managed by a full time Project Officer (HEW 7) responsible for developing and promoting the centre, and supervising the other staff. There are the equivalent of two full time assistants (HEW 3) processing the requests. One full time and a combination of 0.4 and 0.6 employees staff these positions. An additional 0.5 casual (HEW 3) has been employed since June 2001 to help with the quality control checking. This level of staffing has proved to be marginal and additional staff has been requested for 2002.

3.3.2 Software & Equipment

2 HP 6350c flatbed scanners and one HP 7450 flatbed scanner perform scanning of the documents. All scanners are fitted with Automatic Document Feeders (ADF) with 50-page capacity. These HP scanners have an average scanning speed of 24 seconds per page (the newer HP 7450 is almost twice as fast) when creating black and white 1-bit images. While this speed is not the fastest available, the fact that the scanning process is less than 15% of the total time spent processing (discussed below) indicates that there is little to gain in buying more expensive equipment that scans more quickly. The two HP 6350c scanners have scanned around 30,000 pages each without any significant faults.

The ADF simplifies the scanning task because the operator needs only to load the ADF and start the scanning process. No further manual handling of the scanner lid or the pages is required. While the scanner is working through the document the operator can focus on other tasks, such as data entry. To take advantage of the ADF, all books and journals are photocopied on a Konica 7033 digital photocopier. Experience has shown that it is easier and safer for staff to photocopy a tightly bound book or journal than to scan it directly.

The scanning software used is Adobe Acrobat 5.0 plus the HP Precision Pro scanner software. Acrobat 5.0 has its problems, discussed in section 4.1, but it has produced image files that are 10 to 20% smaller than equivalent files in Acrobat 4.0. Acrobat 5.0 is resource hungry, and to successfully scan large documents all day, Windows 2000 workstations with at least 256 MB ram are recommended.

All digitised images are saved on central Digital Unix server. Access to this service is protected by password, and only Monash staff and students are allowed to access the PDF images.

3.3.3 Scanning and modifying the Images

The requested articles or chapters are scanned as black and white 1 bit images at a resolution of 300dpi. These settings were chosen as they represent the best compromise between a good quality image, a small file size and a quick scanning and saving time. Because the Acrobat software starts the scanning process the scanned images are converted directly into a multi-page PDF file.

Using the crop and the rotate tools in the Acrobat software the scanned images were modified to remove black borders and correct the orientation. Cropping the image masks an area to be removed from the image and is useful to remove the black borders that accompany most photocopied pages from books and journal issues.

Rotating the image is necessary because of a long-standing practice in reserve collections of photocopying two pages onto a single A4 sheet. This halves the printing costs for the students. Unfortunately it also means that these pages are scanned in sideways and cannot be easily read unless they are rotated by 90 degrees first. It was the practice of staff to rotate these images by 90 degrees to the correct orientation before saving the image to the server. Because of problems discussed in section 4.1 rotating of the images has been stopped.

It is important to note that the pages in PDF file are images of a page of text and not text document, like a Word file. This fact has two implications:

- The file size for an image is considerably larger than the equivalent text file.
- Other software cannot edit the text in the image.

3.4 Receiving digitisation requests

Academic staff obtain a digitisation request form from the Digitisation Centre's website. They can then submit the request to the Digitisation Centre by four methods:

1. Contact the library's reserve officers and ask them to organise a digital copy.
2. Email the Digitisation Centre with the completed request form attached. Library staff will retrieve the original documents from the collection or through inter library loan. This method does increase the time it takes to complete the request.
3. Mail the request form with the original document to the Digitisation Centre. Original documents are returned via internal mail. Supplied photocopies are recycled.
4. Drop the request form and original documents at the nearest Monash University library site.

Supplying a copy of the journal issue or the book to be copied is preferred, since the digitisation staff can obtain the best quality image from the original document. Clean photocopies are also acceptable. Poor quality photocopies produce very poor images and there may be a significant delay in completing request if a better quality copy of the document has to be located.

Any request, which is deemed to infringe copyright, is rejected and returned to the requestor.

3.5 Process

The centre's operations are geared towards achieving the fastest possible processing time consistent with ensuring copyright compliance and reasonable quality output. When considering how to achieve this objective it is important to remember that the actual scanning of the pages is not the most significant portion of the entire digitisation process. During 2001, the Digitisation Centre took, on average, 46 minutes to process a single 15-page request. Of this time only 6 minutes would be devoted scanning the actual document, i.e. 13% of the total time. The rest of the time is spent checking copyright compliance, manipulating the image and creating a copyright and access record.

3.5.1 Streamlining

To keep the processing time to a minimum, the digitisation process had to be simple and straightforward. To achieve this, several design decisions were made:

- Combining the copyright management record with the library's catalogue record reducing data entry to a single instance.
- Creating only a basic catalogue record, using a standard template, with the bare minimum of data for both copyright compliance and access.
- Scanning the image using the minimum settings appropriate for text (see section 3.3.3)
- Scanning the documents using the Acrobat software.
- Using Windows 2000 operating system, allows the operator to start creating the bibliographic records while the scanner is digitising the document through the ADF.
- Using barcodes as file names for the images, thus allowing a unique name for each file without the headache of creating a consistent naming scheme.
- Encouraging academic staff to submit the original documents with their requests, especially if the document is not held in the local collection.

3.5.2 A brief summary of the digitisation process –

1. Receive digitisation request. Check Copyright compliance of the request.
2. Photocopy request (if not already photocopied).
3. Scan photocopies.
4. Add copyright notice to front of the scanned image.
5. Save scanned image to server.
6. Create a basic catalogue record for the scanned image.
7. Notify requestor by email that the image is now available online and provide URL of the image file.

For reasons of simplicity Digitisation Centre staff do not link these images to Reserve lists for the subject in the Voyager circulation module. If the request has not come from a Reserve staff member then a copy of the email is also sent to the appropriate library reserve staff member to make them aware of the digitisation. It is then their responsibility to decide if the article needs to be linked to a course reserve list on Voyager.

3.5.3 Integration of Copyright Records into the Voyager Catalogue.

Creation of accurate copyright management records is an important goal for the Digitisation Centre. These records are crucial to ensuring copyright compliance and for managing the expanding collection of digital resources. Naturally it was also considered important that the digitised images be accessible through the Monash Library's Voyager catalogue. Rather than create a separate copyright management database it was decided to incorporate the copyright management data into the catalogue record and by this means minimise the amount of data entry in the digitisation process. The decision was easily made because the majority of the data required for copyright management was identical to the information usually included in brief catalogue records for reserve material. e.g. author, title, publisher, date of publication, etc.

The new information required for the copyright records are the name of the lecturer and the course code for which the copy is being made and also the date on which the copy was made.

The Digitised item's bibliographic record is a basic catalogue record, recording just the author, title and publication details. Just enough information is added to the record to allow the record to be both searchable from a citation given by the lecturer and to fulfil the record keeping demands of CAL. A typical bibliographic record for a journal article is shown in Figures 1 and 2. A holdings record is created so that an item record can be added to the bibliographic record. The item record is necessary because only item records can be linked to course reserve lists. The holdings record is suppressed so that it doesn't display on the OPAC.

Figure 1. Public display of digitised journal article.

The screenshot shows a web interface for a digitised journal article. At the top, there are three buttons: "Brief Record", "Show Detailed Record", and "Show MARC Record". Below these, the article details are listed:

- Author: [Balle, M](#)
- Title: Organizations are systems, not just structures [computer file]
- Material type: [computer file]
- Linked resources: [Click here for full text document](#)
- Source: Career development international v1 n7 1996 p18-23

At the bottom, there is a section titled "Save, print and email options" with a table:




Save, print and email options	
Format	Save or print
<input checked="" type="radio"/> Text	 
<input type="radio"/> MARC	
	Email address: <input type="text"/>

Figure 2. Marc record for title shown in figure 1.

000	00649nam 22001215i 450
001	1409752
005	20010309102223.0
008	010309 xx 000 0 eng
100	1_ a Balle, M
245	10 a Organizations are systems, not just structures h [computer file]
524	_ a Career development international v1 n7 1996 p18-23
533	_ d 09/03/2001 n Copied for course <i>mgc1020</i> on behalf of G Hanley. 6 p. copied n Copied under part VB of the Copyright Act (1968) and the Remuneration (Sampling) Agreement between Copyright Agency Ltd. and the AV-CC (March 2000).
856	7_ u http://images.lib.monash.edu.au/mgc1020/04101739.pdf z Click here for full text document

Summary of the Main MARC fields.

000 – 008 Standard fixed fields.

100 Main entry: Author of journal article or book chapter.

245 Title statement: Journal article title or chapter title.

524 Citation note: Journal title, volume and issue number, year of publication and pages copied. Or book title, editors/authors names, place of publication, publisher, year of publication and pages copied.

533 Reproduction note: This note has been co-opted to store copyright management data. Information recorded – date of reproduction, unit code and lecturers name and total pages copied (total pages in the book). Finally a standard copyright note indicating the exemption used to legally copy.

856 Electronic location and access: Web address of the PDF file and a public display note (see figure 1). For large PDF files that were split into multiple parts, multiple 856 fields were recorded.

Additional fields, such as the 700 added author and the 740 added title are added to the record as necessary.

3.6 Statistics

The following figures are a summary of the statistical data collected during 2001.

3.6.1 Digitisation centre output 2001

Jan to Nov:	4931 items	73022 pages
Monthly average:	341 items	4987 pages

Note: Average item size is 15 pages.

3.6.3 Server log file 2001

The log file data from the Gilbert server counts all log entries, whether or not they represent successful attempts to access PDF files. Therefore the figures should be treated as indicative of activity on the server rather than actual instances of documents delivered. It is planned to alter the software analysing the log files to screen for successful data retrieval. Investigation of the log files has shown that the majority of unknown users were failed authorizations.

All users:	706215
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Monash IP address:	279434	60% of all users
Non-Monash IP address:	426781	40% of all users

Student:	425313	60%
Staff:	65494	9%
Unknown:	215408	31%

Month	Jan	Feb	Mar	Apr	May	June	July	Aug
Log entries	0	8835	68417	63689	104639	246010	59003	155622

3.6.2 Voyager OPAC usage logs

Month	Scanned	Database links	Web links
July	114717	2140	830
August	18028	3430	792
Collection size	4078 records	905 records	58 records

Note: Collection of this data started July 2001

The Voyager OPAC usage logs count the number of times bibliographic records were accessed through the Voyager catalogue. When comparing the Voyager figures with the server log file figures it should be remembered that many lecturers encourage their students to access their readings via direct links from the subject web page to the server, bypassing the OPAC entirely.

3.6.4 Figure 3.

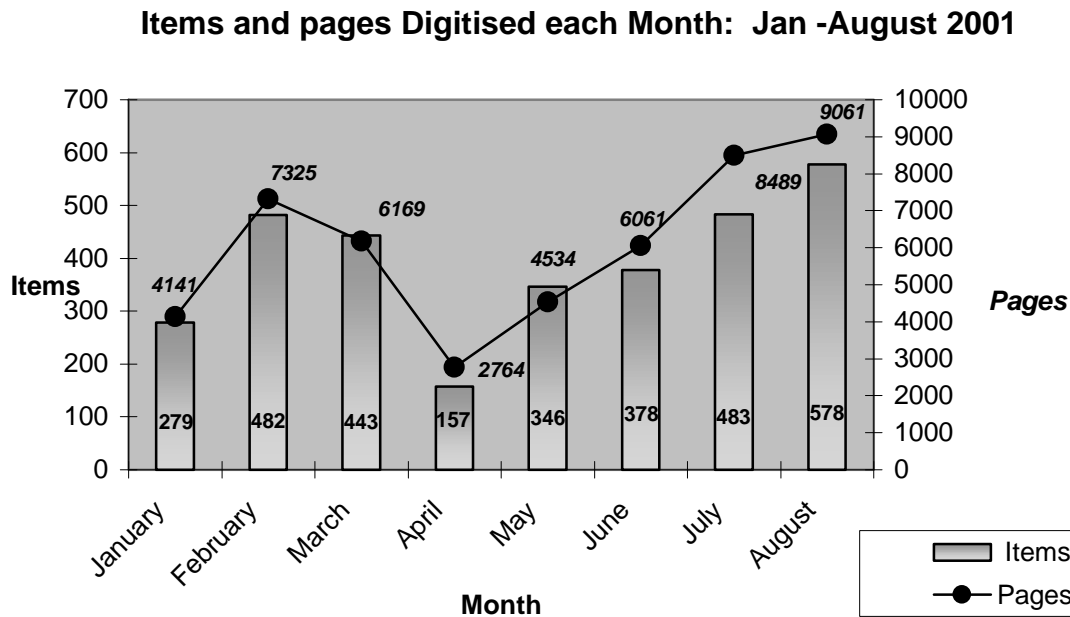


Figure 3 shows the total items and pages processed by the Digitisation Centre for each month from January to August 2001. The graph clearly shows that peak activity is during February, March, July and August, which are the months just before and after the start of each semester.

Activity in April is abnormally low because the retrospective conversion of existing records to include the copyright notice began in April as well as the addition of a file compression technique in the normal processing of items. Both these tasks had a negative impact on productivity (see Figure 4 for further discussion). Therefore the low number of items completed in April represents the growth of a backlog as well as a decline in demand. This backlog was cleared in May when the retrospective activities were completed and file compression standards were relaxed.

3.6.5 Figure 4.

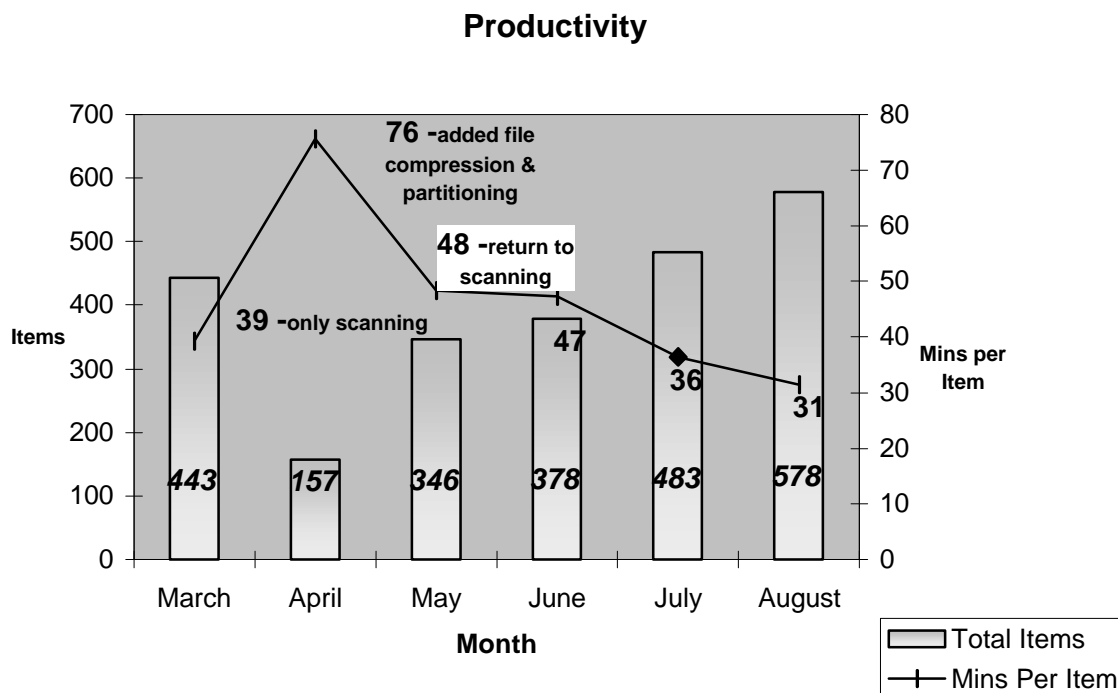


Figure 4 shows the productivity of the Digitisation Centre expressed as the average number of minutes to digitise an item (or request) e.g. it took 31 minutes to process an item in August 2001. The average item has 15 pages. The graph also includes the number of items processed each month to demonstrate the relationship between the high levels of demand and increased levels of efficiency. The productivity is derived by the simple measure of dividing total staff time worked (annual and sick leave are deducted) by the total number of items processed each month.

Productivity is not simply dependent on the amount of work to be done – procedural activities also have a significant impact. As discussed above in Figure 3 and indicated on the graph in Figure 4 the introduction of retrospective conversion and file compression in April had a significant impact on the productivity of the centre. The average processing time per item rose to one hour and a quarter. This figure was deemed unacceptable and led to the decision to relax the standards applied to the image file sizes (see section 4.2 for further discussion on file sizes). The retrospective addition of the copyright notice was mandated by a recent amendment to the copyright act and so this task had to be completed. Fortunately only 1000 records required the notice to be added, so the task was finished by May.

Figures during June are skewed by the absence of one skilled staff member due to prolonged illness and the requirement to train replacements. July figures show the increased effectiveness of the new staff as they settled into the job.

3.6.6 Time taken to process requests

No statistics are kept on turn around times for requests, as this is difficult to track easily. Ignoring delays incurred by document delivery and copyright compliance problems with the request it has been observed that most requests can be processed within a week and priority requests, of less than 15 separate articles, within the day received. Occasional backlogs have built up during peak periods and because of extended, unplanned staff absences. These backlogs have generally meant that some reserve requests may be a couple of days late during peak periods. These backlogs have not lasted and are rapidly cleared.

4 Service Issues

4.1 “Mirror images” - PDF printing problems

Information desk staff in March 2001 reported that several digitised items were printing as mirror images or as blank pages. This was a wholly unexpected development that was not documented in other library’s electronic reserve projects. Consultation with Acrobat’s support services recommended the following solutions:

1. That the file is printed using the “print as image” option in the Acrobat print window.
2. The file is printed on a printer using Postscript printer drivers.
3. The image is rescanned.

Unfortunately “print as image” is not the ideal solution to this problem as it slows down printing on network printers to an almost unacceptable crawl. The postscript printer drivers were found not to work with the network printers installed in the library. The rescanning of the image didn’t always fix the problem and is also a duplication of effort.

This problem was eventually attributed to the practice of scanning every second page upside down and then rotating the digital image to the correct orientation. This practice allowed the document to be cropped as a whole, which is faster than cropping page by page. Once the practice was stopped in May 2001, the reports of mirror images being printed declined.

The problem reappeared again in late July 2001 after the replacement of Acrobat version 4.0 with version 5.0. After a long investigation to identify the new cause of the problem it was eventually determined that the corrupted prints occurred because the image files had been rotated. The solution adopted has been to cease rotating all of the scanned images. Because the older versions of Acrobat Reader don’t include a rotate tool and because this tool is not obvious in the latest version of the Reader, the practice of photocopying two pages to an A4 sheet has been abandoned too, although any photocopies supplied to the Digitisation Centre in this format will be scanned as is.

This decision will not affect the several hundred records that have been cropped and rotated between June and July 2001. For these images the student must still select the “print as image” option in the Acrobat print window and wait for the file to be printed. To alert the students to this, a bright yellow note has been added to the copyright notice and the first page of the document image, warning the student to select this option before printing.

4.2 File sizes

Students have raised concerns about size of the PDF files, in particular the inability for most files to fit on a standard 1.44 MB floppy disk. PDF files average between 1 to 2MB, but can be much larger. In comparison to an equivalent text document the PDF file is larger because it is a black and white image of the page.

Compressing all the scanned images to less than 1.44 MB was tried using Acrobat Distiller software during April 2001. The results were good, but as the graph in Figure 2 testifies the impact on the centre's productivity was marked. Standards had to be relaxed so that only files greater than 5MB are now compressed and partitioned.

Fortunately the size of the PDF files has reduced with the introduction of Adobe Acrobat version 5.0. An example of the performance improvement gained:

Acrobat **4.0** – **80** page document – **21.0 MB**

Acrobat **5.0** – **100** page document – **4.73 MB**

Note: there is no exact correlation between the number of pages and the file size, as other factors such as text density, margins and illustrations affect the final output size.

4.3 Colour images

Digitisation of colour PDF files has never been seriously considered because a colour image file is ten to twenty times larger than the equivalent black and white image, and a file this size is impractical for a student to download on a 56k modem.

While colour PDF files may never be generally acceptable there may be special circumstances in which their use is justifiable. For example, in visual arts colour is important to the integrity of the document as a learning material. Tests are currently being conducted with colour images for visual arts articles to assess the acceptability of these large files.

Some testing has been done with scanning to colour JPEG files, which usually are less than 500 KB per page. Because the JPEG format is a compressed file format there is a price to be paid for the small file size, in that the image's quality is degraded. Further testing will be needed to determine if this is acceptable to the students.

Initially the JPEG files could only be scanned as one image per page, unlike multi-page PDF files. This meant that a 20-page colour document required 20 individual web links on the bibliographic record or web page. This is time consuming to enter and cumbersome for the student to access.

Recently it was discovered that the JPEGs could be converted into PDF image files without any significant increase in the overall file size. Once converted into PDF the images of single pages could be appended together into a multi-page digital document. The resulting file is still larger than the black and white image normally used but the size increase is modest when compared to direct scanning of colour into PDF. For example, 5 MB vs. 50MB.

This process is more time consuming than the normal scanning process described in section 3.3.3 and tests will have to be conducted to see if creating colour PDF files from individually scanned JPEG files is cost effective. The most likely the approach will be to reserve colour digitisation for learning materials where the colour is critical to understanding the document.

4.4 Optical character recognition

Tests with Adobe Acrobat's Capture and Xerox's Onmipage Pro have demonstrated that the use of Optical Character Recognition (OCR) to convert images into editable text in normal scanning processes is too time consuming to be of any value. Furthermore an image file is the best way to preserve the copyright integrity of the digital copy.

Nevertheless the use of OCR is occasionally necessary to provide access to the documents by sight-impaired students. This is because the software that converts text to speech cannot work with images of documents. The university's Disability Liaison Office has the necessary software and the staffing resources to provide OCR conversions of the documents needed by sight-impaired students.

4.5 Copyright compliance

A very successful practice has been to use the Voyager catalogue as the copyright management database. Using basic keyword searches on citation details the Digitisation Centre staff have been able to identify potential breaches in most requests. In light of the problems with quality control, as discussed above, there will still be cases of unintentional breaches because of human error. There is no question that Monash University is taking reasonable steps to ensure copyright compliance.

4.6 Quality Control

Originally the Supervising Project Officer was responsible for checking all work produced by the Digitisation Centre assistants for copyright compliance and typographical errors in the bibliographical records. Practice has shown that it is impractical for the Project Officer to check the output from two full time staff and attend to his other duties managing the centre, developing and promoting the service. As a consequence a large backlog of checking has slowly grown throughout the year.

Because quality control is important in establishing confidence in the copyright compliance of the library's image collection the quality control procedures are being reviewed. To remedy the situation the following changes are proposed:

- Reduce the level of checking to sampling for experienced staff who have demonstrated certain levels of competence and accuracy. New staff will still require close supervision.
- Develop Voyager system reports that will list all scanned item records by their citations. These reports will be reviewed semi-annually during the quieter months for potential compliance breaches.
- Employ a Digitisation Centre coordinator with at least a 0.5 of their time devoted to quality control.

4.7 Digitisation of distance education learning materials

As part of the policy to centralise digitisation, the university library agreed to begin processing Centre for Learning and Teaching Services (CeLTS) Learning materials for distance education and flexible learning courses in May 2001.

These learning materials are collections of various articles and book chapters that are required reading for a course. These collections are published together as a booklet, which is often called the course reader. CeLTS then mails these materials to the students taking the course.

CeLTS' Print and Web Publication Unit already digitises these readers at the Gippsland campus for publication on their Xerox print system. It was agreed that CeLTS staff would convert the Xerox format files into PDF and transfer the files to the library's image server. The Digitisation Centre would then process and record the individual articles and book extracts as per normal practice.

In practice the readers were not as straightforward to process as first planned:

- Dismembering the complete reader PDF file into individual articles files sounds like a simple task, but in practice it is a complex, time consuming and multi-step process. It takes almost a day to completely dismember the average reader file and this is not much quicker than scanning the print copy of the reader in the first place.
- Despite copyright compliance checks having been performed by CeLTS staff, experience has shown that it is still prudent to double-check every article.
- Citation details are usually incomplete and require library staff to search for remaining details.

Furthermore the readers became available for processing at the same time that the reserve requests were increasing in June (See Appendix A). For this reason the Digitisation Centre found it difficult to process the readers in a systematic fashion and still meet its commitments to process incoming reserve requests. As most of the CeLTS readers are not specifically required to be available online the decision to accord them a lower priority was made. This decision was communicated to the manager of the CeLTS Print and Web Publication Centre, who understood the necessity of the decision. Discussions are underway with CeLTS staff to find solutions to improve the level of service for 2002.

To address this issue either additional staff resources must be made available to the Digitisation Centre or some pre-processing at Gippsland campus must be undertaken.

5 Management Issues

Crucial to the success of the digitisation service was the management of the Digitisation Centre. Because the Digitisation Centre provides an important service to the University a fulltime project officer was employed to help ensure that the centralisation strategy was successfully implemented. Monash University Library has had considerable success with previous projects, developing new Information Technology services for the library, by assigning staff to manage the development of the project. Importantly, the project is not just added on top of their current duties, but rather their jobs are redesigned to incorporate the project as a major focus of their work. The management responsibilities of the project officer were:

- Plan and execute the development of the centre.
- Recruit, train and supervise staff.
- Develop operational procedures.
- Promote the service to the academic staff.
- Monitor the performance of the centre.

The planning decisions that were made and operational issues that arose have been discussed elsewhere in this paper, but there are two management issues, that arose during the first year of operations, that should be summarised and discussed.

1. **Training and motivation of the Digitisation Centre's staff.** Because the Digitisation Centre was a new organisational unit it was important to develop good habits, work practices and attitudes right at the beginning. Appropriate training in all the software tools and equipment used in the digitisation process. Understanding of the licensed copying limits and how to put that into practice when assessing requests for compliance with those limits. A further consideration when developing procedures was the level of boredom present in the job. Boredom naturally leads to mistakes and inaccuracies with the data entry. To compensate the procedures are designed so the staff process batches of requests from start to finish, rather being a component in an assembly line. This has the advantage of ensuring that all staff are competent in all the procedures and can fill in for absent colleagues.
2. **Promotion of the digitisation service.** Because the Digitisation Centre's primary purpose is to centralize licensed digital copying of copyright material it is important that all academic staff that wish to obtain digital copies are aware of the existence of the centre. In a very large and geographically diverse organization like Monash University achieving this level of awareness can be a challenge. Awareness was raised by numerous presentations to the faculties, global emails announcing the service and the digitisation policy, as well as a Digitisation Centre website. Various handouts and leaflets were distributed and all library publicity publications included a mention of the centre. Finally, library staff with liaison roles to the faculties were briefed on the Digitisation Centre and encouraged to promote the new service with all academic staff that they had contact with.

The management of the Digitisation Centre is currently transitioning from the project management style to the classic operational management of an ongoing service. While further enhancements of the service are planned and future changes in copyright legislation and digitisation technology have to be allowed for, the core activities of the Centre are now well established.

6 The Future

The main developments of the Digitisation Centre for the future are:

- Closer integration with reserve sections at the different library sites to offer a more seamless service to academic staff.
- Ongoing promotion and raising of awareness of the Centre's services.
- Development of some capacity to process colour images.
- Where technology permits, reduction of the digitised file's size.
- Digitisation of new theses.
- Watching brief on developments in Australian copyright law and the remuneration agreement.
- Ongoing management and eventual preservation of the growing collection of PDF images.

7 Conclusion

The Digitisation Centre has successfully demonstrated that a centralised service is a practical answer to the challenges presented by licensed educational copying in a large decentralised university. Not only are there savings in having just a single scanning operation, but also the centralised record keeping ensures that the university is in compliance with copyright law and is making best use of the license granted by the AVCC-CAL agreement.

The library is uniquely positioned in the university to provide this service. Its experience with records management and service delivery, allows the library to offer a digitisation service which is timely, accurate and complementary to other library services and resources.

Notes

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