

Thesis submitted for the Degree of Master of Applied  
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**AN INVESTIGATION INTO THE USE OF DIGITAL  
TECHNOLOGY TO MANAGE DETERIORATING  
CELLULOSE ACETATE NEGATIVES**

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## ABSTRACT

This thesis aims to examine the issues involved in utilising digital images and assess whether image processing techniques can be used as a cost-effective method of reconstructing the image found in a deteriorated cellulose acetate negative.

Negatives affected by the *vinegar syndrome* are found in large numbers within Australian institutions. This was confirmed by a survey (using a questionnaire) undertaken at the National Library of Australia in 2000. The survey also found that although these collections are large, and hence the level of deterioration variable, little could be done to restore any of the negatives once deterioration had begun.

Storing negatives at low temperature and low relative humidity slows down the breakdown of cellulose acetate; however, it cannot reverse the process once it has commenced. Although removing the gelatine pellicular from the deteriorated cellulose acetate support (making the image easier to view) a possible method of restoration, this becomes unfeasible when dealing with a large collection. As a result, how to manage cellulose acetate negatives once they have deteriorated becomes problematic.

Image-processing techniques used to digitally *restore* these negatives were examined via a series of case studies. These examinations were undertaken using two software packages—the Image Processing Tool kit (IPTK) and OPTIMAS. Deteriorated cellulose acetate negatives were scanned, then a number of program filters were applied to the digital image to determine whether disfiguring elements (referred to as *channelling* elements) resulting from the deteriorated support could be digitally removed.

IPTK and OPTIMAS were not completely successful in removing the deteriorated elements from the digital version. The results highlighted that a number of issues relating to the use of digital technology needed to be addressed. These issues included knowledge of basic technical terms, an understanding of *digital*

language, and how to include the use of digital technology into a long-term strategy for archiving a digitised collection.

This thesis showed that issues relating to utilising digital systems could be addressed by implementing a preservation management plan. A *preservation management plan* can be used to incorporate the goals of digitising, the long-term issues of retaining digital files, ongoing access relating to the digital file, hardware and software, and the importance of having the relevant expertise when undertaking such a project.

Due to the limitations of the printed hardcopy displaying features in a number of the images (figures) outlined in this thesis, a compact disk (CD) has been included with this submission and can be found at the end of this document.

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