ABSTRACT
        Supervision of library digitization is the focus of this
paper. First outlined are the definition, formalization, implementation, and
completion phases of project management. Descriptions of management decisions
involved in digitization projects follow on matters such as: collection
analysis, resourcing, project personnel, production, access and
metainformation, and intellectual property. These procedures to be formalized
and implemented in digitization projects are then highlighted: selection for
digital conversion, plan approach, produce digital collection and access aid,
store in digital archive, create framework, assemble digital collection, test
and refine, and release. Projects in Australian public, academic, and special
libraries are then noted. The paper provides the following pointers for
libraries embarking upon digitisation programs: policy framework, training,
standards, application, and monitoring. (Contains 16 references.) (AEF)

LIBRARY DIGITISATION PROJECT MANAGEMENT

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1. Introduction

Digital libraries are defined in many ways. A common understanding is that they are data repositories that are being newly created in digital form in databases, on Web sites, or from file servers in a variety of combined text and image formats. Such digital libraries may be achieved without recourse to pre-existing forms on legacy media such as paper or film. Conversion is not an issue in this environment.

However, conversion to digital form from existing media, is of particular concern to established libraries keen to fulfil their responsibilities in the areas of collection management, storage, preservation, and access.

A significant issue for library management is to balance access to print-based and electronic resources in a hybrid library environment. Many librarians feel a responsibility to provide an integrated environment that combines catalogue access to print and film material, with provision of direct pathways from reference databases such as catalogues and indexes through to digital source material.

Projects to produce digital libraries have been carried out in a wide variety of contexts. These range from the large scale that assume the creation of a wholly digital collection supported by a seamless digital metainformation framework, to small projects that involve selective digitisation of individual media. These smaller projects may involve simultaneous creation of finding aids that are independent from existing metadata.

Ranging between these extremes, is a variety of applications that in many cases are termed hybrid libraries, since they reflect attempts to provide digital search assistance for collections that are a combination of computer-based, print, film and other media.

Many of the applications lend themselves to a structured project management approach to implementation. Commissioning of many legacy automated library housekeeping systems has long since been carried out by information technology staff trained in project management techniques. However, digitisation project supervision in more recent times has often been carried out by professional staff who have had no project management training, and have adopted relatively *ad hoc* approaches.

2. Library project management

Recently there has been increasing recognition of the role that formalised project management can play in library processes. For example, Black (1996) and MacLachlan (1996) have described project management in the library context. Typically, project management can be organised into definition, formalisation, implementation and completion phases as follows:

> Definition
>> Identification of the project, and individuals and teams to be involved; relationship to institutional objectives; briefing participants and stakeholders on origins; preliminary costing;

establishment of a business case.

Formalisation

Reviewing of objectives, specification of outcomes and identification of sub-tasks; matching of people with tasks; revision of costing, establishment of sequencing and reporting processes; risk assessment.

Implementation

Scheduling; sub-task accomplishment; coordination; testing; monitoring and modification.

Completion

Deliverable production; evaluation; reporting; maintenance and training.

The flexibility required of staff in today's workplace, means that utilising such a framework is often advantageous in the library context.

2.1 Digitisation applications

Digitisation projects necessarily involve management decisions on matters such as:

Collection analysis

Choice of that part of the collection to be processed; criteria for selection; consideration of current physical condition; extent of handling required; present physical storage alternatives; extent of development of finding aids, and how this access may be incorporated into the project; extent of resolution required in full text or image.

Resourcing

Estimation of size and extent of material; preservation methods during handling; database administration contingencies such as file naming, file storage and finding aid requirements; costing of test and production phases; consideration of outsourcing.

Project personnel

Project manager appointment; specialist library staff involvement; reskilling; employment of contractors.

Production

Preparation for scanning; digital formats capture and conversion from print, audio and video; compression choices; quality control through resolution, text error correction and review, sampling rates; working copy handling and backup; storage media; cost establishment through test runs through the digitisation chain.

Access and metainformation

Conversion of existing finding aids; creation of description and indexing at time of conversion; utilisation of standard metainformation formats and content description using authority files and thesauri; database and information retrieval software; integration with existing catalogues; Internet access through page development and macro-level description.

Intellectual property

Management, including determination of restrictions and obtaining clearances; mechanism for recording these within metainformation.

Identification of the procedures that are to be formalised and implemented, has been documented for

general attention in digitisation projects (Kenney & Chapman, 1996; U.S. Library of Congress, National Digital Library Program, 1997). These can be paraphrased using U.S. NDLP headings, and assuming a hypertext style document as:

Selection for digital conversion
>Analyze for scope; determine access aid status; establish custodianship, format for conversion, physical condition and access restrictions.

Plan approach
>Develop methods for preparation & digitisation including preservation treatment plan, evaluation of physical condition; determine capture procedures and repository requirements in relation to files, finding aids and access restrictions; produce a workplan.

Produce digital collection and access aid
>Image and text audio video capture; modification of an existing finding aid or creation of a new one.

Store in digital archive
>Deposit items in digital repository with organised directories.

Create Framework
>Produce mockup and establish links.

Assemble digital collection
>Deposit document-style access aids in digital repository and generate indexes and assemble.

Test and refine
>Review assembled collection for accuracy and completeness and test links.

Release

There is growing interest in the effectiveness of the project management framework. Accumulated reports of digital initiatives such as those of the Association of Research Libraries (1999), Digitisation Forum Online (1999), University of Arizona Library (1999), and IFLA (1999), provide case study material. Software to support project management scheduling has been investigated by Chambers & Perrow (1998) in the UK academic library environment.

3. Australian projects
Some early Australian developments have been reported by Ianella (1996) within the broader framework of digital library initiatives including metadata development. Projects have been carried out principally by individual institutions. However, there have been collaborative projects such as the Australian cooperative digitisation project for which the National Library of Australia, the State Library of New South Wales, and Sydney University's Fisher Library have combined to digitise early Australian novels.

3.1 Public libraries
The larger public libraries, by virtue of the cultural heritage material in their collections, have in many cases embarked upon a range of intitiatives These institutions are more likely to support project management within a policy framework. So for example the National Library of Australia, in addition to its collaborative work has been developing access to its pictorial collection per medium of the *IMAGES 1* project that makes available digital surrogates of an increasing amount of its pictorial collection. Access to this material is available directly through the retrieval software, or indirectly through the Web-based

general catalogue.

The State Library of New South Wales has embarked on a number of projects over recent years including conversion of an indexed analogue videodisc collection of 300,000 photographic images (now available through the Web), the scanning and transcription of Sir Joseph Banks *Endeavour Journal*, and the scanning of Utzon's Sydney Opera House plans These and other projects are carried out under a strategic digital library plan (Thomas, 1998).. This plan embodies principles such as a client focus, providing a mix of enhanced and unmediated electronic access, an orientation on unique and significant resources, and building upon intellectual assets. This has led to the identification of priorities concerning which resources to make available.

Planning documents that provide for digital material within overall collection management approach, constitute a similar framework for projects at other libraries. The State Library of South Australia has digitised its Mortlock pictorial collection (State Library of South Australia, 1999) with reference to an electronic data collections policy. Although projects have been primarily at the National and State level, more proposals are being considered for more modest endeavours such as the libraries such as the Norwood, Payneham and St Peters service in South Australia where a Website dealing with local history is planned.

Of course, public cultural collections are not confined to established libraries. A number of the larger museums and art galleries are investigating or undertaking projects to digitise images for Web-based delivery. These include object photographs at the Powerhouse Museum in Sydney, photographic material at the Australian War Memorial in Canberra. Such work has been given impetus by the pioneering work of ANU in art.

3.2 Academic libraries
There has been some collaborative work between University and public libraries, but usually the universities have worked independently on specific projects.

There have been many such projects, usually conducted on discrete identifiable collections of material. Many have embarked upon making examination papers available through web sites, and such projects have evolved into ongoing standard procedures. Some projects have tackled unique collections of material that is deteriorating and can benefit from Internet access. For example the University of Melbourne is working with old issues of its student newspaper *Farrago*.

Some have made use of external models of project management. For example, the University Sydney University's SETIS project (Cole, 1997), models itself upon the SGML framework and operation of the *Text Encoding Initiative*. It provides a concerted approach to versions of its own archives and rare books that are progressively being digitised, coupled with access to external electronic text publishers.

3.3 Special libraries
A number of university libraries in Australia have an administrative framework that encompasses special libraries. The nature of collections in these libraries is such that they provide good candidates for digitisation.

For example, The Queensland College of the Art Library at Griffith University under the project title Library Image Database Art (LIDA) is producing high resolution images of Australian art converted from 32,000 transparencies. Metadata for access in addition to creator, title and subject keywords includes art style, genre and period. The digitisation policy was developed for information services at the University to meet the needs of the electronic classroom

At Curtin University, the John Curtin Prime Ministerial Library produces an electronic archive of material relating to the former prime minister. The JCPML has developed an archive management framework document that establishes the principles and best practices to be applied and addresses the areas of cooperation, selection of material for digitisation, integrity, access, technology and systems, storage and back-up, networking, migration, and budget (Williamson & Henderson, 1998).

Special libraries more than most, are in a position to supplant legacy material with predominantly digital collections. In some cases host organisations with large publications outputs are actively creating digital material, and becoming a digital library in their own right. For example, the Australian Bureau of Statistics are moving towards complete provision of their source information digitally.

An interesting case is the Parliamentary Library in Queensland, which has a large copyright deposit collection of legacy material, but for much of its incoming material is endeavouring to provide seamless access through its *Concord* online catalogue to material such as digitised newspaper clippings, and digitised off-air videotapes. (parliamentary libraries do not have the same copyright strictures as other libraries in Australia). This is not so much a project, but integration of digitisation processes into all areas of the library housekeeping so that print and digital material together are described in a single networked hybrid catalogue which also links to the source material on request.

4. Looking ahead
Libraries that are seriously embarking upon digitisation programs in Australia, pay attention to a number of matters that support effective project management, and provide pointers to other enterprises wishing to enter into such projects. These include:

Policy framework
> A policy for operation within a collection management framework that embraces:
> - Attention to migration (the retrospective conversion of source materials), with an emphasis on intellectual content of material rather than concerns about elements of the digitisation chain.
>
> - Attention to integration of metadata within evolving catalogues of legacy materials to provide a 'one-stop' interface to all aspects of the collection.

Training
> Identification of continuing professional training requirements for staff, and differentiation between library technician and librarian roles.

Standards
> Attempts to adhere to such principles as espoused by the National Preservation Office, or to use of Web-base metadata standards such as the Australian Government Locator Service's 17 tags.

Application
> Utilisation of best practice in such a way that attention is paid to:
> - Identification of digital resolution that is at least able to reproduce quality of original, for example by loss-less compression.
>
> - Inclusion of backup provisions as expressed in the enterprise's disaster management program, and quality control provisions within the enterprise's adherence to quality control principles.

<u>Monitoring</u>
>Performance evaluation through use studies with attempts to develop cost benefit metrics in comparison with established materials.

The choice of materials for projects and identification of training needs should be done on the basis of clearly formulated conditions (Grygierczyk, 1997; Hedstrom & Montgomery, 1998). The digitisation must be accompanied by adding value through the seamless delivery of materials via metainformation developed from its origins to support library housekeeping function.

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