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Project management

As we saw in Chapter 2, the development of a digital collection can be broken down into a number of distinct phases:

1. Define goals and scope of the collection (covered in Chapter 2).
2. Evaluate and select source material (Chapter 2).
3. Clear permission to use the source material (Chapter 3).
4. Define project objectives and preliminary milestones (this chapter).
5. Determine technical specifications (Chapters 4–7).
6. Develop workflows (Chapter 10).
7. Develop budget (this chapter).
8. Execute the project (this chapter, Chapter 9).
9. Evaluate the project (this chapter).
10. Evaluate the collection (this chapter).

So far, I have covered in detail a number of these phases, such as defining the goals and scope of the collection, evaluating source material, dealing with copyright issues, deciding what types of metadata to use, determining how users of the collection should find and display items in the collection, determining what file formats to use, and selecting a CMS. This chapter introduces a number of topics not reflected in the high-level outline of phases provided above that deal specifically with project management, including planning the implementation of a project, writing funding proposals, staffing, vendor relations and project evaluation. The following two chapters, 'Project operations' and 'Developing workflows', focus on the operational aspects of project management.

The term 'project' can be misleading, as it implies a period of activity with a defined start and end. In many cases, particularly with collections that are intended to grow over time, there is no specific end to the

work – it continues indefinitely. In other cases, the work stops when either the goals defined for the collection have been met or the money allocated to the work has been spent. In this chapter (and in others throughout the book), 'project' is used primarily to describe the work required to create and maintain a collection of digital content. 'Project' also refers to the entire set of activities surrounding development of a digital collection, including promotion, user education and ongoing evaluation, but in general this chapter focuses on the narrower meaning of the word. 'Project management' includes overall planning of this work, overseeing of project operations, project staff and project funding. Whether or not the actual work stops at a specific point in time or whether it continues as the collection grows is not important because both types of projects need to be managed.

Typically one person (a project manager) or a small group of people (a management committee) is responsible for the planning and execution of a defined project. Depending on the size of the library or the number of staff involved in the development of locally created digital collections, this person may or may not be the same one who is responsible for other aspects of the collection, such as advocating for its development, gaining financial commitment from their library, or defining the collection's goals and scope. The production of content and the related work required to make the content available to users frequently occur quickly, with firm deadlines and limited resources, and it is important that libraries creating collections take the role of project manager seriously, as managing any project is usually a time-consuming and intense activity.

Sequence and timing

Not surprisingly, the above list of phases hides a good deal of complexity. To begin with, the fifth phase, 'Determine technical specifications', is really a catch-all that involves defining the metadata that the collection will use, determining the search and display functionality, determining the file formats that will be used, and selecting a CMS. As we have seen, all of these tasks are themselves fairly complex, and ideally should be completed before actual production of content begins, given that each has implications for tools, workflows and procedures. For example, during this phase, desired search and display functionality may influence file formats, which may in turn determine the tools that are used during the creation of the files.

Likewise, search and display requirements and the functionality of the CMS will determine what types of structural metadata need to be created.

Second, even though it is convenient to view the phases as a sequential list, in practice it is not always possible to complete one and move on to the next sequentially. Two examples:

- The original goals for a collection may need to be revised later because of technical or budget issues that arise.
- Securing the rights to include a large amount of material could take more time than initially anticipated, resulting in delayed digitisation and the need to alter workflows in order to finish the work on time.

In addition, some of the activity that is defined early in our list of phases may continue past the beginning of later phases. The best example of this is the clearance of permission to include material in the collection. Depending on national copyright laws, material should not be digitised before permission to do so has been secured, which means that some material may be 'held back' from the project execution phase. However, this material can remain in the clearance queue while the project moves forward and other material is digitised and made available. One of the most challenging roles of a project manager is balancing the complex relationships between the various phases in a project.

One phase that should happen at a specific point in the planning of a digital collection is the development of the budget. This activity should happen after the workflows and project objectives have been finalised, not before. Later in this chapter I will cover 'evidence-based budgeting', which requires that workflows and procedures be sufficiently developed to perform representative samples of the work in order to determine how much time they take. It is important that the creation of a budget follows the development and testing of workflows; otherwise, cost and estimates and production milestones will be highly speculative. The more information available before the budget is created, the more accurate the budget will be.

To summarise, even though we can identify a fairly linear progression between distinct phases in the development of a digital collection, in many cases it will be necessary to adopt a more flexible approach. The exception is developing the budget: accurately projecting the cost of executing a project requires that as many decisions are finalised early in the planning process as possible.

Planning the implementation

Another area of complexity not reflected in the list of phases provided above is planning the implementation of the project itself. This activity, broken down into specific tasks, clusters around phases 5, 6 and 7:

a. Define project objectives and preliminary milestones
b. Determine technical specifications
c. Develop workflows
d. Determine preliminary procedures based on workflows; begin project documentation
e. Determine what resources you need (hardware, software, staff)
f. Decide if you will outsource
g. Develop budget
h. Evaluate and acquire necessary resources
i. Finalise milestones
j. Finish project documentation
k. Hire and train staff, if necessary
l. Start production

This series of tasks begins with identifying objectives and milestones and ends with the start of production work. The remainder of this section will cover each of these aspects of planning the implementation.

Defining project objectives and preliminary milestones

A collection's goals are the starting point for defining the objectives of the project. Objectives should describe the desired outcomes of the project, specifically the deliverables expected at the end of the project (if a specific end point has been defined). Milestones describe desired outcomes at specific points in time throughout the project and are used to assist in monitoring the progress of the work being completed.

As an example, I will use the following statement of a collection's goals developed in Chapter 2:

> The Southeastern Regional News Collection contains selected issues of the *County Herald* and *Crighton Daily* newspapers

> published between 1900 and 1920. The collection, which will be freely available to everyone over the World Wide Web, will be of interest to local historians, to genealogists, and to the students seeking primary source material from the early part of the 20th century. Access to the major articles and in each issue will be aided by the addition of subject keywords. Each newspaper issue will be presented as a single Adobe Acrobat file for easy printing.

Once we have a clear statement of the project's goals, we can determine how much work needs to be done by compiling an inventory that lists all of the major groups of content that will be included in the collection based on physical format, and within each group, the number of documents that need to be digitised. It is useful to define these groups by physical format (text, image, audio, video), as the ultimate purpose of this inventory is to help us plan the amount of work that will need to be competed and how long it will probably take. Each format group will require its own workflow (or at least major section of a workflow). Finally, in addition to the number of documents within each format group, it is necessary to calculate how many components or parts of each document will need to be processed. For text, the countable unit is pages; for graphic materials, it is usually the entire document (e.g. a single photograph); for audio and video, it is each separate document, but as these two formats must be digitised in real time they are generally quantified by their duration. Again, the goal of this inventory is to determine the amount of work that will need to be completed during the project, so the inventory needs to be fairly granular. It is better to define more format groups than fewer because you can combine similar groups later; by contrast, defining your format groups too narrowly can introduce unnecessary complexities into your cost estimates.

To proceed with our example, during the content evaluation and selection phase of collection planning, the following calculations were used to estimate the total number of pages published in the period 1900–1920. As stated above, the two newspapers are of the same physical format, but we are putting each newspaper in its own group simply to assist in determining the total number of pages (Table 8.1):

The number of issues to include in the collection was determined during the evaluation phase. The staff evaluating the material concluded that in general one issue per month of the *Herald* and one issue every 2 weeks of the *Daily* would provide a representative sample of the articles, advertisements and other content in the newspapers. Based on this assessment, approximately 9840 pages need to be digitised.

Table 8.1 Sample calculations for estimating extent of source material

Newspaper	Average no. of pages per issue	No. of issues per week	No. of issues in collection	Approx. no. of pages in collection
County Herald	15 pages/issue	1	240 (one per month)	3600
Crighton Daily	12 pages/issue	5	520 (one every 2 weeks)	6240

The project is to be performed over a period of 10 months (that is the period during which the funding is available). Therefore, 984 pages need to be scanned every month (or 246 every week), on average, during this time. This figure will be used to determine preliminary production milestones.

Based on the information we have at this point, the preliminary monthly milestones for the project can be represented as in Table 8.2:

Table 8.2 Sample production milestones

End of month	No. of pages to be digitised
1	984
2	1968
3	2952
4	3936
5	4920
6	5904
7	6888
8	7872
9	8856
10	9840

These milestones are preliminary at this point because we have not performed the detailed calculations necessary to determine how many staff we will need (and we do not have enough information to do that at this point). We will almost certainly need to revise these milestones as information about funding and resources becomes available, but it is good to have a general idea of how much content we will be expected to produce at this point so that we can at least start planning for staff, hardware and other resources.

In some cases, the project is not intended to complete all of the work required to fulfil the collection's goals, such as when the collection has open-ended goals or when the collection is intended to be completed in specific phases over an extended period of time. In these cases, defining milestones and using them to track project status is still essential, if only to track how much is being spent in staff salaries.

The role of workflow

As suggested by its position in the implementation list, workflows need to be developed as early as possible. From a project management perspective, a clearly defined workflow provides information necessary to:

- Determine the tasks required to achieve a specified set of outcomes and the order in which these tasks must be completed.
- Determine costs. As already mentioned, the only sound method of determining the resources required to perform a given set of tasks (and the costs of performing those tasks) is to perform a representative set of those tasks and document actual costs carefully. Workflow modelling and evaluation is therefore necessary *prior* to estimation of costs associated with the production of digital content.
- Clarify duties and responsibilities. Systematic workflow definitions can help clarify who is responsible for what and can serve as the basis for negotiations between partner libraries, vendors, consultants and other participants in the creation of a digital collection.

Chapter 10, which deals exclusively with workflow development, will expand on these three functions, but at this point it should be apparent that workflow development is a crucial component of project management.

Project documentation

In the next chapter I will cover documentation as it relates to project operations: documentation of detailed procedures, rationales for decisions, administrative metadata and general best practices for creating operational documentation. A number of other kinds of documentation that are not particular to digital collection development must be managed efficiently. These types of documentation are required for any type of project (e.g. they apply to retrospective cataloguing of print

materials as well as digitising content) but are worth mentioning here nonetheless. These include:

- *Finances*: Financial aspects of a project need to be documented very carefully. Financial audits are a real possibility, particularly if funds have been received from public agencies, and any funder has the right to ask for documentation on how project managers are spending its money. Many institutions rely on centralised financial services (at the library or parent organisation level) to assist in this documentation. Periodic reporting to funders is much easier if sensible documentation procedures are established early in the project.
- *Staffing documentation*: Job descriptions, documentation regarding position creation, applicants' forms and resumes, and other types of documentation should be handled in accordance with your institution's normal practices.
- *Results of monitoring the project*: I will discuss the importance of documenting the results of monitoring later in this chapter.
- *Meeting minutes*: Notes and minutes from project staff meetings should document the status of the project, issues that require attention and action items.

Documentation should be viewed as a regular activity and not one that is performed on an as-needed basis, and it should be built into each of the phases identified earlier as part of large-scale collection planning, from defining the goals and scope of the collection to project and ongoing collection evaluation. Every phase needs to be documented in some way, but in particular, evaluating and selecting source material, clearing permission to use the source material and determining the technical specifications for the collection all require considerable documentation. Given that creating and maintaining useful documentation is time-consuming, it can take considerable staff resources, and therefore should be included in the overall staffing and budget for a given collection or project.

Staffing

The tasks that operational staff perform will be defined in project workflows. Similar tasks should be grouped into roles, which are general types of staff positions that can be used in planning and in developing job descriptions. Stephen Chapman provides the following list of staff roles typically involved in digitisation projects:

- Project manager
- Selector
- Conservator, curator, or other analyst of the source materials
- Preparations technician (may also be curator, who, in turn, may also be the selector)
- Cataloger to create or enhance bibliographic records and to withdraw materials for conversion
- Scanning technician or photographer
- Quality control technician (may also be the scanning technician)
- Metadata analyst (may also be the cataloger)
- Data entry technician
- Programmer or other database expert who integrates metadata and images into a coherent resource (also known as the digital object)
- Systems administrator or other manager of electronic records and systems
- Network administrator to implement security and other access requirements (may also be the systems administrator)
- Developer or designer of the user interface[1]

These roles may not apply to every project, depending on the nature of the source material and the workflows that you have defined. For example, the staff required to work on a collection of born-digital material will differ from the staff required to work on a digitisation project. Also, some of these roles, such as cataloguers and network administrators, may be assumed by existing staff who perform these functions as part of their regular jobs. Having existing library staff perform work in short-term projects is a good way to save on staff costs, and many funders consider existing staff time to be 'in kind' contributions (discussed further below). However, if existing library staff are to work on the digitisation projects, they must be allowed to devote the required time and not have the extra work simply added to their existing responsibilities. In some cases this means that the digitisation project takes priority over other activity or that someone else can take on work displaced by the digitisation project without exceeding their own normal workloads.

A number of factors should be considered when creating job descriptions for project staff. First, new positions may be based on existing ones if they exist, particularly for roles such as cataloguers,

systems administrators and software developers as the skills required for these positions are in general not specific to the work that is required in digital library development projects. On the other hand, many positions in Chapman's list are quite specialised and project managers may have difficulty finding models for suitable job descriptions. Second, much digitisation work is repetitive and detail-orientated, particularly that of scanning or digitisation technicians. Therefore, it is important to build variety into their job descriptions. Two strategies for ensuring variety are (1) have each staff member fill multiple roles or (2) have each role perform a variety of tasks. The disadvantages of setting up positions in this way is that it may be more difficult to fill such positions because of the variety of skills required, and when a person leaves a project, multiple roles are left vacant.

Planning for staff training in digitisation projects can be challenging. In short-term projects that have a defined duration, staff filling positions created specifically for the project will need to be trained early in the project period. For training to occur, hardware and software must be operational, and procedural documentation must be ready. Staff taken from other parts of the library will also need to be trained on project operations but this can sometimes be done before the training of new staff happens, provided documentation and tools required for their work are ready.

As stated earlier, an individual project manager should be identified as being responsible for the project. This person is directly involved in the planning of the project, assembling and allocating the required resources, monitoring the progress of the work, managing the budget, and for evaluating the project and often for evaluating the collection after the work is complete. Project staff should report directly or indirectly to the project manager; if there is a separate supervisor of project operations, most project staff will report to this person, who in turn reports to the project manager. In small operations, the project manager and supervisor can be the same person, but in larger operations, the demands of both of these roles can quickly surpass a single person's capacity. In fact, larger projects will probably need more than one supervisor, especially if the production work is done in shifts that exceed a normal work day or if it is done at more than one physical location.

In some cases a committee, instead of a single individual, performs the role of project manager. Committees are common in large-scale or long-term projects, and in multi-institution projects. However, smaller, shorter projects are often best managed by a single individual who can draw on the expertise of others when needed.

In Chapter 9, 'Project operations', I will cover the roles of project supervisor, digitisation technician and quality control technician in detail.

Hardware and software resources

If your library does not already have the hardware and software resources necessary to create the desired content, you will have to acquire them. Unfortunately, acquiring scanners and other digitisation hardware is not as straightforward as it might sound, so project plans must include suitable lead times if production is to start on a given date.

A number of factors will help you determine the requirements for the hardware and software you will need to create your collection's content. First, information gathered during the source material evaluation phase, such as format (still images, sound, etc.), physical dimensions and physical condition, should be considered when selecting digitisation hardware. Second, fully developed workflows can assist in the selection of hardware and software by helping define the most efficient set of steps in which to create content and metadata. The desired set of steps can then be used to define criteria for evaluating hardware and software. For example, if you know that you will in general be using TIFF as the format for the master versions of image files you are creating, you can include the ability to create TIFF files in your scanner evaluation criteria. Limitations in hardware and software can often be compensated for in workflows, but usually this compensation involves additional tasks, which add to overall project costs. The next chapter, 'Project operations', will provide additional, detailed information on evaluating suitable hardware and software.

It may be tempting to evaluate and acquire hardware and software based on the requirements of a single collection or the workflows of a single project, particularly if these resources will be purchased from funds allocated specifically for that collection or project. However, if a library intends to develop additional digital collections or participate in collaborative collection development initiatives, acquiring hardware and software that can produce files meeting a variety of criteria is a much sounder strategy. Acquiring a scanner whose maximum output resolution is the exact resolution required in the current project is less preferable to acquiring a scanner that can output images at much higher resolutions. Typically, the better the hardware, the more expensive it is, but all other things being equal, if you can afford hardware that exceeds the requirements of your current project, you should consider acquiring

it as future projects may have more demanding technical specifications than the current project. Realistically, however, you need to work within your budget, and if you can only afford digitisation hardware and software that meets but does not exceed the requirement of your current project, then that is what you should buy.

To a large extent, exactly when you evaluate and acquire any new hardware and software does not matter, except that you will need to know the minimum technical specifications that content in your collection will adhere to, and you need to know if you have the funds to buy the required resources. Obviously you will need to have all tools in place in time to document procedures prior to training new staff. This applies to hardware, software used in the production of the content and metadata, and the CMS you will be using. Project deadlines and staffing levels can have an impact on how much hardware and software you will need. For this reason, many project managers wait until they know the final deadlines and staff budgets before acquiring new hardware.

Outsourcing

Producing digital content, even on a small scale, requires a substantial investment in hardware, software, space and staff resources. Many libraries are not in the position to make these investments or are otherwise happy to avoid making them. Instead, they send original material to a vendor, who creates the digital content and then delivers it to the library, ready for loading into the library's CMS. Alternatively, the vendor may be responsible only for digitising the material and the library will perform other required tasks, such as creating derivative versions for presentation on the web. The latter case applies to libraries that wish to avoid investing in digitisation hardware but still want to be involved in the production of their content. Some libraries also outsource the creation of descriptive metadata, whereas others choose to create their own even if they outsource digitisation or conversion. In some cases, the library does not host its own collections, but contracts with a vendor to host them on its servers.

When deciding whether to invest in the infrastructure necessary to develop and maintain a digital collection, a library may choose from a number of options:

- performing all work internally,
- hiring a commercial vendor to perform all or parts of the work required to produce the content,

- hiring a consultant to plan and oversee the project, with the work done either internally or by a vendor,
- collaborating with other libraries, and
- a combination of the above options.

Janet Gertz's chapter cited in the 'Further reading' section at the end of this chapter provides extensive information on the relative benefits of doing the work internally or contracting with a vendor, on selecting a vendor and on developing the various documents that are necessary when outsourcing such as Requests for Information and Requests for Proposals. The information Gertz provides is thorough and detailed and will prove to be extremely useful to libraries considering contracting with commercial vendors for the production of their digital content and metadata.

Contracting with other libraries that act as 'vendors' is becoming increasingly common. This type of relationship differs from multi-institutional projects (discussed below): the 'client' library is simply contracting with the 'vendor' library to do specific types of work instead of contracting with a commercial vendor. Many libraries that have invested in digitisation hardware, software and staff have the extra capacity to do external work, particularly during periods of low activity from their own projects. In these cases, the client and vendor libraries must come to an agreement that is satisfactory to both parties, and the vendor library must be able to perform the work at rates comparable with those charged by vendors. This type of relationship may be preferred when the client libraries feel most comfortable dealing with other libraries, particularly if they cannot find a commercial vendor that meets their needs. Also, it is not uncommon for larger university and public libraries to act as digitisation and metadata production centres for smaller libraries within their geographical region that may have interesting collections but not the resources to digitise them. On the other hand, some libraries may prefer to deal with commercial vendors because they feel that it is easier to establish business-like relationships with commercial entities or that it is best to collaborate with other libraries on a more equitable basis than the client–vendor relationship often implies.

Hiring a consultant to assist in planning and to oversee project operations is yet another option. A good consultant will have experience in digital library content development, will balance the goals of the collection with the resources available for the project, and will demonstrate flexibility in how problems are solved. Avoid consultants who are tied to a particular set of technologies (unless the library would adopt those same technologies

independent of the consultant's recommendations). Keep in mind that a consultant cannot assist a library with a digital collection project (or any other type of project) unless library staff assist the consultant: clearly communicating the expected outcomes of the consultant's work and freely providing the information the consultant needs are essential. The best possible outcome of hiring a consultant for this type of project (other than a successful digital collection, of course) is successful knowledge transfer; in other words, library staff should be able to plan and manage similar projects on their own in the future, if doing so is part of the library's long-term digital collection development programme.

In addition to outsourcing the production of digital content and metadata, some libraries choose to make their collections available using CMSs hosted externally. Options for making the collection available to end users include:

- host the collection on servers maintained by the library's parent institution,
- host the collection on a commercial vendor's servers, or
- host the collection on another library's servers.

Like selecting an external source for content production, selecting a vendor or other library to host a collection allows libraries with content to create digital collections without investing in the required infrastructure. Many libraries do not run their own servers or do not have the technical staff required to maintain a CMS. On the other hand, many libraries would rather host a CMS than acquire scanners and specialised software, and employ the staff necessary for creating digital content.

Preparing a budget

Preparing a budget for a digitisation or conversion project can be somewhat complex because of the following factors:

- *Variability in workflows for different projects*: Digitising or converting still images, text, video and audio source material all require different sets of tasks, and even within each type of source material there can exist a wide range of workflows (we have seen, for example, that there are several substantially different approaches to digitising texts). Collection functional requirements can vary widely as well, as can options for creating metadata. This matrix of implementation variables can result in real challenges for project managers who need to estimate

how much it will cost to create a given collection. Costs are determined by the nature of the project workflow, and if mangers cannot predict workflows, they cannot predict costs with much accuracy.

- *Inconsistency in source material*: Even though careful project managers will base cost estimates on representative samples of the source material they are working with, many collections of source material contain hidden surprises that complicate production significantly and therefore have a real impact on a project's overall budget. This impact can be considerable given the cumulative effect of high numbers of unexpected exceptions.
- *Limitations of technology*: Whether due to temporary problems or due to systemic limitations, problems with technology can dramatically affect the likelihood that a project will be completed on time and within its budget.

As already stated, by far the safest way to estimate the costs involved in producing specific digital content is to develop appropriate workflows and procedures, perform trials, document the cost of the trials, and then using those costs extrapolate the cost of processing the entire collection of source material. Any other method of determining costs is an educated guess. Even in the unlikely event that your institution will accommodate budgets that are off by 50–200% (to pick arbitrary figures), it is safe to say that few external funders will. They will typically want to know exactly how much it will cost to accomplish the goals you describe in the grant applications.

This type of evidence-based budgeting is not easy. It is difficult if not impossible to do on short notice, it can require resources (such as hardware) that are not available prior to receiving the funding you are applying for, and it can be inaccurate if staff performing the trial runs are not proficient at using the available workflows and tools, which they may not be without a few weeks' experience. It can also create a misleading sense of confidence in cost estimates, particularly if the workflows and procedures are not fully developed or if the source material being tested is not typical of the entire collection. Finally, even though evidence-based budgeting provides fairly accurate data for estimating the costs of staff who are performing the tasks, it does not necessarily provide accurate data on how much time supervisors and project managers spend on tasks not directly related to production, such as documentation, supervision and writing reports. Despite these drawbacks, using empirical evidence to estimate costs lends authority to budgeting, and even if these informed estimates prove to be inaccurate, the information derived from trials will allow you to identify the areas that are inflating actual production costs.

In some cases it is not necessary to perform trials on representative samples of source material in order to derive an accurate budget if the project you are planning is very similar to ones you have performed in the past. In these cases, the known costs from the previous projects can act as a reliable indicator of the likely costs in the new project. However, this method is reliable only to the extent that the source material, metadata requirements and workflows of the two projects are the same. Even slight differences between source material and technical specifications can cause estimated costs to be inaccurate, particularly if the number of items in your collection is large.

Cost components

The largest costs for a digitisation project are operations staff (staff performing permissions clearance, metadata production and content creation; supervisors; project managers, etc.), hardware, software, copyright clearance fees and a CMS, whether a vendor product or open source. If your library already has suitable hardware or software, or a suitable CMS, those items will not represent additional real costs (although they may be applicable as in-kind contributions on grant applications, as described below). The most common type of cost for any project is staff. It is difficult to generalise about the relative proportions of the various types of cost in a project because of the wide variability in hardware, software and CMS prices, and because staff costs are unknown for any project until workflows have been tested. Using documented costs from a series of large-scale digitisation projects, Steven Puglia found that roughly one-third of the cost of the production of those collections accounted for digitisation, one-third for metadata creation, and the final third for administration, quality control and other activities.[2] Although these findings were derived from actual recorded costs, they should be used as a general guide only and not as an accurate planning formula, for reasons stated earlier.

After production is complete, ongoing costs include collection maintenance, promotion and evaluation. Preservation of the digital content will also have real costs, and as we saw in Chapter 5, these are at best difficult to predict.

An example budget

The following example illustrates how project managers can develop a budget based on performing trials of the tasks identified in a project's

workflow. The example is simple but realistic, and includes every aspect of the digitisation and metadata creation activities necessary to put a small collection of audio tapes online. It includes estimates for two positions other than the staff involved in content and metadata production, a web developer who is configuring a CMS for the collection, and a project manager who is responsible for supervision, documentation, training and quality control. It does not include the work necessary to clear permission to mount the material on the web. The collection consists of 110 tape recordings of authors reading short fiction or excerpts from longer works.

In preparation for developing this budget, we have developed a workflow and digitised a number of samples. From these trials, we have determined that the following are reasonable average amounts of time for processing each reading (Table 8.3):

Table 8.3 **Workflow tasks and average times for processing sample audio recordings**

Task	Estimated time required
Retrieving and preparing each tape	15 minutes
Converting audio tape to WAV and naming the file according to documented procedures	20 minutes
Converting each WAV file to mp3 format for the web and copying it to the designated archive directory	10 minutes
Creating descriptive metadata for each sound file	20 minutes
Adding administrative metadata to the CMS, copying the master WAV file to the archive drive, and adding the mp3 file into the CMS	10 minutes

A note about converting from audio tape to WAV: the conversion must be done in real time (i.e. a tape that is 15 minutes long takes 15 minutes to convert). Even though the technician does not have to sit at the workstation during the conversion but can do other tasks – in theory he or she could be preparing the next tape while the previous one is playing and being digitised – we have decided to account for the times as if the technician did not perform other tasks while waiting for the tape to finish playing.

Another note, this time about how to perform the budgeting trials: for most projects where textual content is being produced, the number of pages is a useful unit to base timelines on as each page needs to be scanned separately. For image-based collections, the number of images

that are required would be an appropriate unit; for collections of audio or video that must be digitised, the number of minutes or hours may be more appropriate as these formats must be digitised in real time.

The Conversion Technician, who retrieves each tape, digitises it and converts the files from WAV to mp3, earns $15.00 an hour plus 8% benefits, and the Metadata Specialist, who applies all metadata and adds the files to the archive directory, earns $20.00 an hour plus 9% benefits. To calculate the cost of digitising the entire collection and creating the accompanying metadata, we multiply the average times identified above by the number of tapes (Table 8.4):

Table 8.4 **Estimated time required to digitise entire collection and create metadata**

Task	Estimated time required to complete the project	Total time required to complete the project
Retrieving and preparing each tape (Conversion Technician)	15 minutes/tape	0.25 hours/tape × 110 tapes = 27.5 hours
Converting from audio tape to WAV and naming the file according to documented procedures (Conversion Technician)	20 minutes/tape	0.33 hours/tape × 110 tapes = 36.3 hours
Converting each WAV file to mp3 format for the web and copying it to the designated archive directory (Conversion Technician)	10 minutes/tape	0.17 hours/tape × 110 tapes = 18.7 hours
Creating descriptive metadata for each sound file (Metadata Specialist)	20 minutes/tape	0.33 hours/tape × 110 tapes = 36.3 hours
Adding administrative metadata to the CMS, copying the master WAV file to the archive drive, and adding the mp3 file into the CMS (Metadata Specialist)	10 minutes/tape	0.17 hours/tape × 110 tapes = 18.7 hours

The costs for the Web Developer and the Supervisor are calculated separately (Table 8.5). The former is a freelance consultant who charges a flat rate and has supplied a quote indicating that the work will not take more than 10 hours to complete. The Project Manager/Supervisor's salary is more difficult to estimate accurately, but based on similar work done

Table 8.5 Tasks and salaries for the Web Developer and Supervisor

Type	Estimated time required	Estimated cost
Web Developer, who has to modify some of the CMS web templates for publication of these files. This activity does not include any other activity. (Position 3)	10 hours	$40/hour, no benefits
Administration, including project development, documentation, staff training and supervision, and quality control (Position 4)	50% of all staff time including the Web Developer	$32/hour, plus 12% benefits

at the library, we estimate that the Supervisor will need to spend half of the total time required by the Conversion Technician and Metadata Specialist to digitise the material and create metadata. This estimate is relatively high but it includes the time required to write the procedures manual and to perform quality control on the digitised sound files (by listening to the beginning, middle, and end of each reading, for example).

Now that we have estimated costs for all of the staff, we can add them together in the following spreadsheet (Table 8.6; numbers of hours are rounded up to the nearest hour):

Table 8.6 Total staff costs for processing the audio recordings

Title	Conversion Technician
Number of hours	28 + 37 + 19 = 84 hours
Hourly rate and total salary	$15.00/hour × 84 hours = $1260.00
Benefits (8% of total hourly wage)	$100.80
Total cost for Position 1	$1360.80
Title	Metadata Specialist
Number of hours	37 + 19 = 56 hours
Hourly rate and total salary	$20.00 × 56 hours = $1120.00
Benefits (9% of total hourly wage)	$100.80
Total cost for Position 2	$1220.80

Table 8.6 **Total staff costs for processing the audio recordings *(Cont'd)***

Title	Web Developer
Number of hours	10
Hourly rate and total salary	$40.00
Benefits (0% of total hourly wage)	$0.00
Total cost for Position 3	$400.00
Title	Supervisor
Number of hours	70
Hourly rate and total salary	$32.00 × 70 hours = $2240.00
Benefits (12% of total hourly wage)	$268.80
Total cost for Position 4	$2508.80
Total staff costs	$5490.40

This example illustrates a linear workflow, which means that all of the tasks are performed sequentially. To budget for parallel workflows, in which independent tasks are performed at the same time and the output from each is combined later, we need to add additional rows in our spreadsheet for each of the parallel tasks and then add up all of the costs. In other words, the time required to digitise the source material using parallel workflows is cumulative – we need to pay the salaries of all the staff who contribute to the creation of a digital document, even if they are working at the same time but on separate tasks. For example, if we had someone transcribing the audio tapes as they were being digitised in order to create a searchable 'full text' for each tape, the salaries for both of these staff would need to be included in our budget.

Additional planning considerations

Once the amount of staff time required for a project is known, we can estimate the number of staff we need to hire, the amount of hardware and software we need to procure, and the amount of physical space required to do the work.

After fully developed workflows, the next issue to resolve is how much time is required to complete the project. The number of work days available to you will let you determine how many staff to hire, which in turn will determine how much hardware you need and how much

physical space you need. These numbers can be determined by various factors, such as the amount of time a funder gives you to spend their money, the end dates of fiscal years, the availability of staff (e.g. scheduling work shifts around major holidays is often problematic), or other factors. Ultimately, you will need to determine when you plan to launch your collection. This date may or may not be flexible, and you may need to launch the collection before all the content and metadata are ready, but in practice you will probably have to juggle all of the timing factors listed here in order to get a fairly accurate idea of how long your project will take.

Given the total amount of time required to complete the tasks defined in our workflow, and the number of days available within the project timeline, we can estimate the number of hours of work per day that need to be completed. Given the total number of hours of work, we can determine the number of staff required, and from that number, the amount of hardware and physical space they will need to complete the work. This formula is only a guide – adjustments may need to be made in response to contingencies such as unpredictable availability of staff (e.g. most students do not want to work at exam time) and delays due to hardware and other problems. However, the total number of hours of work required to complete a project is a useful basis on which to estimate associated resources.

First, for the conversion technician and metadata specialist, we need to calculate the number of work hours per day required to complete our project:

> *Number of hours per day required to complete all work = Total number of hours required to complete all work/number of available days*

For the sake of this example (Table 8.7), we are told by the library administration that we need to spend all of the money allocated to this project within 4 weeks (or 20 working days):

Table 8.7 **Hours of work per day required to complete all work**

Position title	Hours required to complete all work	Days available	Hours per day required to complete all work
Conversion Technician	84	20	4.2
Metadata Specialist	56	20	2.8

Using this figure of 4 weeks and the number of hours in a standard working day (in this case 7 hours per day for full-time equivalent staff, or FTE), we can determine the number of positions we need for the conversion technician and the metadata specialist in order to complete work within the given timelines (Table 8.8):

Table 8.8 **Positions required to complete all work in days available (FTE)**

Position title	Hours in standard working day (1 FTE)	Hours per day required to complete all work	Positions required to complete all work in days available (FTE)
Conversion Technician	7	4.2	0.6
Metadata Specialist	7	2.8	0.4
Supervisor	7	3.5	0.5

Number of positions required to complete all work = Number of hours per day required to complete all work/number of hours in a standard working day (for 1 FTE)

The right-most column shows that the number of positions required is less than one FTE for each position title. This figure is useful in determining how many people to hire, and whether their positions will be full time or part time. In our example, because all of the positions are less than one FTE, we may be able to complete the project in fewer than 20 days if we make the positions full time; if the number of positions were more than one FTE, we would need to hire more than one person, or increase the number of days in which we would be able to complete the project (which the library administration says is not an option).

At this point we should finalise our project milestones. In the earlier example in which we devised some preliminary milestones for the digitisation of the local newspapers, we did not have much information – only how much content was intended to go into the collection and an estimate of how long we had to complete the project. In this example, however, we know an additional and important piece of information: how many staff we will need to complete the project. Once we know that, we can finalise our project milestones. If we monitor the project's

progress carefully, we will be able to detect any significant deviations from these refined milestones and take corrective measures if necessary.

Also, now that we have determined the number of staff we will need to hire, we can determine the amount of work space and hardware required. In our example, we will need a separate workstation for the Conversion Technician and Metadata Specialist, and a separate workstation for the Supervisor (the Web Developer will work at home). The Conversion Technician will need to have the tape player arranged near his or her computer workstation in order to capture the audio. If circumstances were such that we needed to hire more than one FTE staff member for each position (if, for example, we had 80 hours of audio to capture and catalogue in the same number of days), we would need to hire more than one person for each position, which would require more work space, more computer workstations (each with the necessary software), and in the case of the Conversion Technician, more than one tape player and audio capture card.

Executing the project

At this point we are ready to finish project documentation, hire and train staff, and begin the actual production of our content and metadata. Any required hardware, software and work space must now be in place as well. The next two chapters deal with project operations and workflow development, and expand substantially on the topics introduced here.

Proposal writing

Project managers are usually required to prepare formal proposals for funding. Funders can be internal (to the institution), private (individuals, foundations, corporations or other organisations) or public (government bodies at any level, from municipal to international). In this section I will introduce some general information about proposal writing. The jurisdiction that a library is part of can have a significant impact on its eligibility for a particular source of funds, so I will not identify specific sources of funding.

The process of applying for funding will be defined differently by each funder. In some cases, the funder will provide a standard form that needs to be completed, sometimes with attachments or appendices containing

narrative responses to particular questions. The form and all supporting documentation must then be submitted by a given date. In other cases, particularly where the amount of available funds is high and the time over which they can be spent is long (e.g. from a full year to several years), the application process may involve multiple submissions delivered at different deadlines. In these cases, funders will issue invitations to applicants to submit to the next phase of the process, with each submission containing more detailed information. Finally, some funding organisations rely on a less formal application procedure that does not involve standardised forms, but instead defines criteria (ranging from general to quite specific) that applicants address in their proposals.

Proposal components

Despite this variety of requirements, most funding proposals contain at least some of the following components. Both this list of components and the list of terms described in the next section are general and not necessarily comprehensive. However, they do include some of the more common aspects of funding proposals that you may encounter.

- *Letter of intent*: In application procedures where multiple components must be submitted at different times, the first component often takes the form of a 'letter of intent' indicating that the institution intends to pursue the grants in question and that may give very general information about the proposed collection or project. The funder responds to this letter with an invitation to proceed with the remainder of the application or a statement of why the applicant is not being invited to proceed.
- *Executive summary*: A brief summary of an application, typically containing information such as the name of the applying institution, names of major partner institutions, title and nature of the collection, fund(s) being applied for, amount being applied for, and a brief indication of the relevance of the collection or activity to the funder's stated objectives.
- *Description of your organisation*: Brief and selective description of the library applying for the funds. Frequently this information is detailed in a form that may ask basic information such as principal contact person, year founded, charitable organisation status, number of employees, and so on, while in other cases the funder may require detailed information about the library's previous projects, partners and funders.

- *Project objectives*: A clear statement of what the funds will be spent on, using language that the funders will understand.
- *Description of how funder's objectives will be met*: Not all funders support 'digitisation', but many support job creation for students, building databases of local content or some other activity that you can incorporate into your project. Funders want to know that their money is being spent on things that matter to them, and you should be prepared to explain why *your* project meets *their* objectives.
- *Project work plan*: Some funders require a work plan, which is typically an outline or table indicating major milestones in the project.
- *Project budget*: Budget formats vary widely, from simple forms to sophisticated Excel spreadsheets that include formulas to calculate items such as administration charges, salary calculations, and maximum allowable amounts in various categories such as hardware or copyright licensing fees.
- *Appendices*: Some applications may require other documentation, often grouped together as appendices, attachments or schedules. These documents can vary widely depending on the requirements of the application, but can include letters of support from partners (both for the current project and for previous projects), letters or special forms from officials in the library's parent institution, screen captures or printed pages from prototype websites if applicable, and sample job descriptions or job advertisements.

Assembling the information required for most applications can be time consuming and difficult. For large grants it is not uncommon to treat the application process itself as a 'project' that requires hiring consultants or providing temporary replacements for existing staff. Although the amount of effort required to complete most application procedures should not require additional staff, you should assume that any formal, structured application process will take considerable coordination, particularly if you must involve people outside your library for letters of support, financial information or other reasons. Most funders will not accept applications past their stated deadlines.

Proposal terminology

The following terms are used frequently in funding applications. In some cases, application documentation will actually contain definitions of the terms used throughout the application and even some examples of how

the terms are intended to be used. Obviously, paying close attention to the instructions for completing applications is extremely important. Missing components or misinterpreted questions can disqualify an application, and if the funder receives many more applications than they intend to fund, they will be looking for opportunities to make their adjudication easier.

- *Partners*: Many funding agencies favour applications submitted on behalf of multiple institutions – in fact for larger grants this may be a requirement. Typically, one institution must be identified as the 'lead' or 'principal' partner, if for no other reason than to simplify the funder's accounting procedures (the lead partner would be responsible for distributing funds to partners). The term 'partner' will probably be defined within the application documentation, but participants of all types, from individuals to entire organisations such as commercial companies, universities or government departments, may be considered partners.
- *In-kind contribution*: 'In-kind' describes resources that the institution, as opposed to the funder, is expected to supply. As this term is generally used within the context of a project budget, it will usually be defined very specifically; for example, some funders consider staff salaries to be in-kind, whereas others do not. In-kind contributions are also often subject to formulas that qualify the value of the contributions in some way, such as reducing the value of a $5000 scanner to $500 that can be applied to the institution's contribution. In addition to staff resources, other typical in-kind contributions include hardware and physical space for digitisation and related activities.
- *Cash*: In contrast to in-kind contributions, cash is typically money that an institution must contribute to a project that they would not spend if they were not participating in the project (in other words, it must be additional to their normal operational costs). The most common costs that cash contributions apply to are staffing and hardware. In general, the same resources cannot be considered cash and in-kind contributions, although some funders allow claiming staff time as a 'cash in-kind' contribution.
- *Outcomes*: Funders will frequently ask for a statement of 'outcomes', which are generally equivalent to your project's goals. To be effective, outcomes should be worded such that they are understandable to readers of your application (i.e. free of library jargon) and consistent with the funder's objectives. Many funders will use language that is

tied very closely to their mandate or organisational objectives. For example, government agencies at various levels may allocate funds to supporting projects that employ youth; some large private foundations have been requiring any software created with their funds to be released under a specific open-source licence. When describing outcomes, it can be advantageous to adopt some of the language used in the proposal documents, particularly when discussing how your project's objectives align with those of the funder.

- *Deliverables*: Deliverables tend to be more concrete and countable than outcomes. Items that might be expected in response to a question about what deliverables a project will produce include a description of the website/CMS, the number of documents, any standards or reports, or other documentation or software developed during the creation of the content (CMS platforms, software utilities, etc.).
- *Evaluation*: Many grant applications will ask how you plan to evaluate the success of your project, and may even ask you to write a final report and sign a release so they can use the report for their own purposes. I will cover project evaluation later in this chapter.
- *Sustainability*: Finally, some funders are interested in how long their investment will pay off. If they fund early stages of a project, they may ask what its long-term sustainability is and what the library's long-term goals for the project are. Your response to this type of question will depend on your institution's and your partner's commitment to the project. If a collection is open (content will continue to be added), a statement of sustainability should address how the ongoing activity will be funded; if a collection is intended to be closed (for example, the scope of the collection is narrow and the content appropriate to that scope is likely to make it into the collection within the defined life of the project), a statement of sustainability may only need to address issues of preservation and ongoing evaluation.

Reporting

If your grant application is successful, you will be expected to report to the funders periodically. Many funders will require clear and comprehensive reports of how their money is being spent. This is as true of funds allocated internally from the library as it is of funds awarded from an external organisation. Every funder will define its own reporting

requirements, but typically they will include periodic statements of how much money has been spent, statements of periodic quotas or milestones for deliverables, and progress on other work that is being funded.

Monitoring

Monitoring is essential for any type of project, not just projects producing digital collections. Periodic checks on the progress being made and the identification and correction of any problems as they occur will dramatically increase the chances that a project will meet its defined goals and will do so without exceeding the allocated resources.

The most important aspects of monitoring digital content creation projects are ensuring that objectives and milestones are being met, ensuring that the available budget is not being overspent, holding regular staff meetings and documenting the outcomes of issues resulting from those meetings. First, it is more efficient to keep production on schedule throughout a project than to try to make up for low production at the end of the project. Available space, hardware and staff resources will probably be insufficient to increase the output required toward the end of the project to meet overall objectives. Second, production milestones should be linked to ongoing costs, so that at any time during the project you can predict if the funds allocated to the work will be sufficient. Third, communicating with production staff regularly through regular meetings ensures that problems they encounter are dealt with as early as possible. Finally, because one of the goals of monitoring a project is to address potentially serious issues as early as possible, documenting problems as they arise and are resolved will allow even faster resolution of similar problems should they arise again.

Evaluating the production phase of the project

In a general sense, the content production phase of a digital collection project should be considered successful if it reaches the project's stated goals. However, evaluating projects according to specific criteria is desirable for a number of reasons: evaluating a project after its completion can demonstrate to funders that their money was spent the

way they intended it to be spent, can validate a project and can identify areas for improvement. The most useful strategy for evaluating a project is to build evaluation into the project's goals. In other words, one of the project's goals should be to undergo a systematic evaluation. Explicitly stating this goal will help keep the project focused and will encourage project managers to maintain accurate and thorough documentation.

The exact criteria by which projects will be evaluated should be determined by the desired outcomes of the evaluation, which should be defined by the project manager(s), the library administration and the project funders. Criteria will fall into the following categories:

- *Production milestones*: Typical criteria include the project's ability to meet defined production milestones and objectives, and what constitute acceptable deviations from defined objectives.
- *Budget*: Obviously, the project's ability to accomplish its goals within the defined budget is important. Using substantially less money than the amount defined in the budget is less likely to happen than overspending, but funders may not look favourably on what they would perceive as an overestimation of the funds required to complete the project. Careful monitoring will help avoid this situation.
- *Quality benchmarks*: Evaluating the ability to meet defined levels of quality over the duration of the production activity is relatively easy (provided standards of acceptable quality have been clearly defined and documented) and should provide no surprises if quality control has been performed throughout the project.
- *Operational aspects*: Evaluation of the suitability of the hardware, software and workflows is useful as a planning tool for subsequent projects. Staff job descriptions, scheduling and other aspects of staffing should also be reviewed at the end of each project.

To summarise, careful monitoring during the project is a form of formative evaluation, but summative evaluation of the work involved in creating digital content is an important aspect of overall project evaluation.

Evaluating the overall project

Content production is only one aspect of the 'project' associated with a digital collection. Initial and ongoing promotion, the benefits to users, financial sustainability and ongoing maintenance issues should also be

evaluated. The NISO *Framework of Guidance for Building Good Digital Collections* defines four principles by which projects should be evaluated:

1. A good collection-building project has a substantial design and planning component.
2. A good project has an evaluation plan.
3. A good project produces a project report and broadly disseminates information about the project process and outcomes.
4. A good project considers the entire lifecycle of the digital collection and associated services developed through the project.[3]

The second principle may sound tautological, but it actually emphasises the need for systematic evaluation. As the *Framework* states, 'An evaluation plan demonstrates the commitment of a project to its stated goals and objectives.' To support development of effective evaluation plans, the *Framework* cites the Institute of Museum and Library Services' list of resources on Outcome-Based Evaluation (OBE).[4] As the IMLS describes it, OBE determines the impact of digital collections on users' knowledge, attitudes, skills and behaviours. This impact is evaluated by using techniques such as online questionnaires that test users' knowledge. The IMLS website offers this example:

> In order to know if online availability had a benefit, an institution needs to measure skills, attitudes, or other relevant phenomena among users and establish what portion of users were affected.
>
> To capture information about these kinds of results, a library or museum could ask online visitors to complete a brief questionnaire. If a goal is to increase visitor knowledge about a particular institution's resources, a survey might ask questions like, 'Can you name 5 sources for health information? Rate your knowledge from 1 (can't name any) to 5 (can name 5).' If visitors rate their knowledge at an average of 3 at the beginning of their experience, and 4 or 5 (or 2) at the end, the sponsoring institution could conclude that the web site made a difference in responders' confidence about this knowledge. It should be clear that such a strategy also lets you test your effectiveness in communicating the intended message![5]

Regardless of whether the narrowly defined activity involved in content production is being evaluated or whether the entire set of activities surrounding the development of a digital library collection is being

evaluated, a thorough and effective evaluation plan should be part of the overall project goals.

Evaluating the collection

The third type of evaluation that project managers should perform is evaluation of the collection. This evaluation is actually part of ongoing collection management, and will happen after the 'project' has ended, whether defined narrowly by its production phase or more broadly by a larger set of activities.

The NISO *Framework of Guidance for Building Good Digital Collections* provides seven principles of 'good' collections (good meaning generally appropriate for the user groups the collection is aimed at) that are independent from aspects of projects described above. These principles can be used both as planning tools and as evaluation criteria:

1. A good digital collection is created according to an explicit collection development policy that has been agreed upon and documented before digitisation begins.
2. Collections should be described so that a user can discover characteristics of the collection, including scope, format, restrictions on access, ownership, and any information significant for determining the collection's authenticity, integrity and interpretation.
3. A collection should be sustainable over time. In particular, digital collections built with special internal or external funding should have a plan for their continued usability beyond the funded period.
4. A good collection is broadly available and avoids unnecessary impediments to use. Collections should be accessible to persons with disabilities, and usable effectively in conjunction with adaptive technologies.
5. A good collection respects intellectual property rights. Collection managers should maintain a consistent record of rights-holders and permissions granted for all applicable materials.
6. A good collection has mechanisms to supply usage data and other data that allows standardised measures of usefulness to be recorded.
7. A good collection fits into the larger context of significant related national and international digital library initiatives.

Project managers should develop mechanisms during production that will capture the information needed for testing these attributes, such as entrance or exit surveys on the collection website, usage loggers, in-person interviews, focus groups or general feedback forms that users can complete. Part XII of the NINCH *Guide to Good Practice in the Digital Representation and Management of Cultural Heritage Materials*[6] provides detailed discussion of the types of mechanisms that can be used to collect information from a collection's users. OBE, described above, can also be applied to the collection on an ongoing basis if desired.

Multi-institution projects

Increasingly, libraries are collaborating on digital collection-building activities. This collaboration is different from the client–vendor relationships between libraries described earlier. Partner libraries come together to create digital collections for the same reasons they come together co-operatively to subscribe to commercial databases and electronic journal collections or to share virtual reference services: to form strategic alliances, to pool resources and to please funding agencies, which to a large extent favour multi-institution projects over ones undertaken by a single institution.

The advantages of collaborating that are specific to digital collection building are that the costs of specialised hardware and software can be distributed, expertise can be shared, large projects can be delivered in shorter timeframes, and libraries that are not able to invest in hardware and software can participate by performing other types of necessary tasks, such as clearing copyright permissions and creating descriptive metadata. Collaborative efforts also have the disadvantage of increased administrative overhead, which can manifest itself in a number of ways, including record-keeping requirements that are not compatible with all partners' local institutional practices, scheduling meetings and holding them via teleconference or video conference, etc., and making sure that all partners meet project milestones and deadlines.

From a practical perspective, multi-institution projects introduce a number of complications that need to be taken into account. First, development of workflows that are distributed among multiple partners can be challenging simply because having multiple sites provides more ways of getting the work done: in some multi-institution projects, most or all of the work is carried out in parallel at multiple sites, whereas in

others, each partner performs different sets of tasks that are then integrated centrally. In order to maximise efficiencies, the implications of distributed workflow should be explored carefully during the planning phases of multi-institution projects.

Second, all participating institutions must conform to the project's technical specifications. Care must be taken that file formats, file densities, colour depths, sampling rates, metadata formats, the application of metadata creation guidelines and file naming conventions are consistent across all partners. Use of the same hardware and software at all contributing institutions promotes consistency, but in reality being able to use identical resources at each site is not common, particularly if each site possessed its own hardware and software prior to the start of the project. However, regular checks of output from partners will ensure that inconsistencies are minimised.

Third, the number of participating institutions can have a considerable impact on the project's ability to meet production milestones. The more partners fall behind, the harder it is to recover; by contrast, the more partners are involved in producing digital content, the more likely it will be that shortfalls can be taken on by other partners if they have the extra capacity. All of these issues can be mitigated with sufficient planning and continuous communication among partners.

Summary: managing digital collection projects

Developing a digital collection encompasses a relatively complex set of tasks. However, if the collection's goals have been defined clearly, those tasks can be grouped together and performed in an effective order. The group of tasks surrounding the production of the digital content can be considered the core of the overall set of activities required to make a collection available to users, but it cannot happen without considerable planning and preparation. In particular, the development of workflows early in the overall project timeline is essential for the success of the project. Budget, the role of digitisation vendors, the roles of partners in multi-institution projects, local hardware, software and staffing requirements all depend on effective, tested workflows (so much so that I will spend an entire chapter on this topic).

The production of the digital content is not the only aspect that must be planned carefully. Effective documentation, proposal writing,

evaluation of both the production phase of the project and the project as a whole, and ongoing evaluation of the collection over time are also tasks that project managers must perform or oversee.

Further reading

Gertz, J. (2000) 'Vendor relations', in *Handbook for Digital Projects: A Management Tool for Preservation and Access*. Edited by M. K. Sitts. Andover, MA: Northeast Document Conservation Center, pp. 141–53. Available at *http://www.nedcc.org/digital/viii.htm*

Gertz explains the benefits of both digitising in house and outsourcing, and covers all important aspects of working with digitisation vendors not covered in this chapter, including selecting a vendor, writing a Request for Information and Request for Proposal, evaluating responses from vendors, drawing up contracts and dealing with quality control issues.

Library Hi Tech. Special issue on collaborative digitization projects. Vol. 23:2 (June 2005).

This special issue contains eight articles describing collaborative digitisation projects from the USA, including articles on sustainability, partnerships between libraries and museums, multi-institution training and support, CMSs, and benefits to end users.

New York Public Library. Picture collection online project documents. Available at *http://digital.nypl.org/mmpco/documents.cfm*

This site contains links to documents NYPL submitted to the IMLS for their Picture Collection Online funding application, including the proposal abstract and narrative, general workplan, deselection criteria (for identifying images that would *not* be included in the collection), quality control procedures, metadata guidelines and OBE proposal and workplan.

NISO Framework Advisory Group (2004) *A Framework of Guidance for Building Good Digital Collections*, 2nd edn. Bethesda, MD: NISO. Available at *http://www.niso.org/framework/Framework2.html*

Cited several times in this chapter and elsewhere in this book, the NISO *Framework* provides a number of principles of digital collections, objects, metadata and projects that will be useful to project planners and

managers, and also provides links to selected resources that support and expand on those principles. Each section contains a brief case study.

Notes

1. Chapman, S. (2000) 'Considerations for project management', in *Handbook for Digital Projects: A Mangement Tool for Preservation and Access*. Edited by M. K. Sitts. Andover, MA: Northeast Document Conservation Center, p. 27. Available at *http://www.nedcc.org/digital/iii.htm*
2. Puglia, S. (1999) 'The costs of digital imaging projects', *RLG DigiNews*, 3:5. Available at *http://www.rlg.org/preserv/diginews/diginews3-5.html#feature*
3. NISO Framework Advisory Group (2004) *A Framework of Guidance for Building Good Digital Collections*, 2nd edn. Bethesda, MD: NISO. Available at *http://www.niso.org/framework/Framework2.html*
4. *http://www.imls.gov/applicants/obe.shtm*
5. *http://www.imls.gov/applicants/basics.shtm*
6. The Humanities Advanced Technology and Information Institute and the National Initiative for a Networked Cultural Heritage. (2002) *The NINCH Guide to Good Practice in the Digital Representation and Management of Cultural Heritage Material*. Available at *http://www.nyu.edu/its/humanities/ninchguide/*