# Digitization Procedures Manual Guide

## Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>How to Use This Guide</td>
<td>2</td>
</tr>
<tr>
<td>1.0 Introduction</td>
<td>4</td>
</tr>
<tr>
<td>2.0 Purpose/Objectives of a Digitization Procedures Manual (DPM)</td>
<td>4</td>
</tr>
<tr>
<td>3.0 Authorization</td>
<td>4</td>
</tr>
<tr>
<td>4.0 Scope</td>
<td>4</td>
</tr>
<tr>
<td>5.0 Normative References/Applicable Publications</td>
<td>4</td>
</tr>
<tr>
<td>6.0 PRE-PROCESS</td>
<td>5</td>
</tr>
<tr>
<td>6.1 Business Analysis</td>
<td>5</td>
</tr>
<tr>
<td>6.2 Records Management Issues</td>
<td>6</td>
</tr>
<tr>
<td>6.3 Risk Analysis</td>
<td>7</td>
</tr>
<tr>
<td>6.4 Outsourcing vs. In-House</td>
<td>8</td>
</tr>
<tr>
<td>6.5 Cost-Benefit Analysis/Return on Investment/Budget Identified</td>
<td>9</td>
</tr>
<tr>
<td>6.6 Recommend Solution</td>
<td>11</td>
</tr>
<tr>
<td>6.7 Staffing and Project Team</td>
<td>11</td>
</tr>
<tr>
<td>6.8 Communications Plan</td>
<td>12</td>
</tr>
<tr>
<td>6.9 Errors Planning and Reporting of Errors</td>
<td>13</td>
</tr>
<tr>
<td>6.10 Training Requirements</td>
<td>13</td>
</tr>
<tr>
<td>6.11 Program Overview</td>
<td>13</td>
</tr>
<tr>
<td>7.0 PROCESS</td>
<td>14</td>
</tr>
<tr>
<td>7.1 Document Selection</td>
<td>14</td>
</tr>
<tr>
<td>7.2 Preparation of Original Documents</td>
<td>15</td>
</tr>
<tr>
<td>7.3 Conversion</td>
<td>16</td>
</tr>
<tr>
<td>7.3.1 Image Capture (Scanning) Procedure</td>
<td>16</td>
</tr>
<tr>
<td>7.3.2 Quality Control of Image Capture Process</td>
<td>17</td>
</tr>
<tr>
<td>7.3.3 Image Re-Capture (re-scanning) Process</td>
<td>17</td>
</tr>
<tr>
<td>7.4 Indexing</td>
<td>18</td>
</tr>
<tr>
<td>7.4.1 Quality Control of Indexing</td>
<td>19</td>
</tr>
<tr>
<td>7.4.2 Re-Indexing/Index Corrections</td>
<td>19</td>
</tr>
<tr>
<td>7.5 Quality Assurance Requirements</td>
<td>19</td>
</tr>
<tr>
<td>7.6 Storage</td>
<td>20</td>
</tr>
<tr>
<td>7.7 Delivery/Transfer</td>
<td>21</td>
</tr>
<tr>
<td>8.0 CONSIDERATIONS THROUGHOUT PROJECT</td>
<td>22</td>
</tr>
<tr>
<td>8.1 Physical, Administrative and Personnel Security Procedures</td>
<td>22</td>
</tr>
<tr>
<td>8.2 Technical Considerations</td>
<td>22</td>
</tr>
<tr>
<td>8.3 Preparation and Retention of All Audit Logs</td>
<td>23</td>
</tr>
<tr>
<td>9.0 Process for Updating this Manual</td>
<td>24</td>
</tr>
<tr>
<td>References</td>
<td>24</td>
</tr>
</tbody>
</table>

August 2016

http://www.im.gov.ab.ca/
How to Use This Guide

With the shift to managing records in digital formats and the increased efficiencies in digitization techniques and processes, many records are being digitized. To manage these records and ministries’ core business effectively, a full and accurate documentation of digitization activities must be recorded and maintained over time for reference and in case of litigation. These considerations are valid regardless of the record’s content, the storage media or the type of original record.

Ministries should justify the implementation of a digitization program based on an analysis of their work processes and business needs. Media conversion and indexing costs can exceed those of physical storage, and the maintenance of electronic records systems require regular and often costly upgrades to avoid becoming obsolete. Careful analysis of the viability and sustainability of digitized records should be considered before starting any digitization project.

This document is meant to be used as a guide when creating a Digitization Procedures Manual (DPM). It is organized to match the DPM template, and has details and examples to guide the ministry in creating a complete DPM. The examples in this document are a sample of things that should be included and are not meant to represent a comprehensive list of all items that must be considered.

The considerations outlined in this guide are important regardless of whether a ministry is considering a new digitization project or is in the process of documenting an already existing digitization project and process. There may be some sections with information that doesn’t seem relevant - such as the cost benefit analysis or a review of whether the scanning should be outsourced or done in-house - but all of this information is important when documenting a project. The analysis should have been done in the past and reference to any documents outlining all decisions made previous to the commencement of a project should be added to the DPM. If, as is the case in some long-standing project, the information is not available, note that the decision was made in the past and add as much detail as can be found.

The ministry’s DPM is intended to ensure that digitized business records are trustworthy, reliable and recognized as authentic and to support the creation of a DPM for any and all digitization projects across the GoA where the original document is being replaced by a digitized record. The DPM should include details relating to how digitization will proceed and the justification for why the ministry has selected the options outlined in the procedures. These details will help to:

- Ensure that electronic records can reliably support business decisions and exchanges of commitments;
- Enhance the admissibility and the weight of electronic records in a court of law, a tribunal or an inquiry; and
- Protect the value of electronic records in documenting the content and accountability for decisions and transactions.

The DPM sets out the policies and procedures required to record the usual course of business or process for digitization projects for the Government of Alberta (GoA). Importantly, this manual should provide evidence to satisfy the following requirements for the admissibility of electronic records in legal proceedings:

- A record was created in the usual and ordinary course of business;
- The circumstances surrounding the creation of the record, including any exceptions or special handling for specific records types or series;
- The integrity of the electronic records system; and,
• The integrity of the electronic record.

The DPM must be completed and should be finalized within 60 business days of each project’s commencement date. If applicable, a system documentation manual must also be completed within the same timeframe. The system documentation manual should cover all aspects of the electronic content management system including architecture, security, roles and responsibilities, audit, etc.

The DPM must be written before litigation occurs. An amendment that is written after the digitization program is challenged may negatively affect the credibility of the program, therefore putting at risk the admissibility of its digitized business records if such an entry is shown to be contrived evidence, or written to justify the challenged procedure, practice or rule.

Documentation of the directions a ministry’s project has taken can be a key factor in the long term success of digitization efforts. Good documentation can offset the impact of staff turnover and allow future staff the ability to deal with digital collections created by their predecessors. Among the items to consider documenting:

• Relevant guidelines and benchmarks for digital record quality and resolution;
• Resources (documentation, standards, stakeholders, etc.) that contributed to the creation of the DPM;
• Types of metadata captured;
• File naming schemes; and,
• Sustainability plans and procedures (storage, archiving, migrations, etc.).

To ensure the credibility of the digital record management program, the following factors are necessary to document in each DPM:

• Written authority from senior management to establish the digital record management program;
• The program's integration into the usual and ordinary course of business of the business unit;
• A disposition plan (i.e. Records and Disposition Schedule) for the regular disposal of original records within a reasonable period of time after the microfilming or image capture process;
• The establishment and documentation of the program's systems and procedures;
• Provision for quality assurance;
• Provision for appropriate storage and preservation of the digital records considering its desired retention period; and,
• The program's conformity to all applicable records, micrographics and electronic image standards.

It is important to note that disposition of digital records must be documented in the same manner that logs are kept for the disposition of paper records.

It is recommended that each DPM for each digitization project should follow the format outlined in this guide, with any additions that are relevant to the project. Where applicable, the corresponding section in the DPM template is noted after each section title.

Please note: Information and recommendations provided in these guidelines are considered to be accurate at the time of creation. Information may be amended or replaced at any time as technology and the needs of the GoA change.

**Exclusions**
This guide does not apply to the use or digitization of:

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1.0 Introduction

This section should provide a brief, high level description of the project and may include: the history of the records collection being digitized, the justification for the project, etc.

2.0 Purpose/Objectives of a Digitization Procedures Manual (DPM)

The reason for the proposed digitization project and the intended or desired result (the “why”). This may include a brief, high level summary of information presented in other sections, such as the business analysis and recommended solutions.

3.0 Authorization

The purpose of a DPM is to provide a record and persuasive evidence of the GoA’s usual and ordinary course of business for digitization projects. Therefore, it is important that the project and the DPM be authorized by senior management.

4.0 Scope

The “what” and “how” of a project should be defined. It is also important to define the limits of the records collection being digitized. For example, whether the whole of a specific collection is included, several related collections associated with a program, or specific parts of a collection.

5.0 Normative References/Applicable Publications

This section should include a list of all standards, policies, directives, and best practices relevant to the project and DPM. These may include: IMT Digitization Standards, CAN/CGSB 72.11, CAN/CGSB 72.34, ISO/TR 13028:2010, relevant Records Retention and Disposition Schedules, relevant legislation (such as FOIP), and other GoA or ministry specific documents. This may also be a good section to highlight any special considerations relating to any of the above that need to be applied to the records collection and the digitization project.

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This section may also include a list of other support documents referenced throughout the DPM.

6.0 PRE-PROCESS

6.1 Business Analysis

A thorough feasibility and business analysis must be completed and approved by the program’s ministry prior to starting a new digitization project or amending an already existing digitization project (ex: adding new records sets or amending previously established processes). Carefully thinking through the many components of a digitization project will go a long way towards ensuring a successful outcome. Consider factors such as how digitization fits into the ministry’s overall strategic plan, technology plan and project workflows.

Identifying the intended uses will help define the ministry’s digitization strategies. Stakeholders should help define digitization needs and how digitized business records can meet strategic goals.

In determining the feasibility of the project and developing the business rationale, it is important to consider the advantages and disadvantages of digitized business records within the context of each program.

Advantages include:
- Ability to use digital media instead of paper.
- Shorter retrieval time when the digital records are well indexed.
- Greater sharing of information between ministries and departments.
- Multiple consecutive users and user access levels are possible.
- Ease of information dissemination.
- Ease of use of digitized business records in vital records and disaster recovery plans.
- Ready access to digitized records, which may assist organizations needing to retrieve information efficiently during litigation and discovery.
- No loss of digital record quality from generation to generation. Well-made copies and derivatives can be as good as the original digital records.

Disadvantages include:
- Digital records are not readable without computer equipment.
- Potentially significant equipment costs, including hardware and software.
- Potential for hardware and software obsolescence.
- Indexing requirements may be more extensive than is required with other formats. Unless records are arranged in a logical sequence or clearly indexed, it may be difficult to identify a series or to use groups of records as a series.
- Different types of scanners may be required to scan text, oversize items, photographic prints, slides, and other formats.
- Digital quality control and both image and metadata capture and management are complex, time-consuming processes requiring expertise.


- Complex disposition and potential problems in implementing dispositions need to be addressed and can include the following:
  - If records are stored without regard to retention periods on an individual disk or in an individual directory, each record must be individually selected for destruction or moved to offline storage.

Thorough consideration of the above advantages and disadvantages and a review of how the project fits into the ministry’s strategic and operational objectives should be considered and documented.

In considering how digitization fits into your ministry’s overall strategic plan, IT strategy, and project workflows, consider these questions and document the relevant responses.

- What is your purpose in digitizing business records?
- Does the project support the ministry’s mission?
- What are the intended uses of digitized business records?
- Who are the intended users inside and outside the GoA? Should they be involved in the project?
- Who owns the digitization project?
- What are the physical characteristics of the original records collection (refer to Selection of Documents section)?
- What is the project’s timeframe?
- How is the project being funded?
- Who will be responsible at each stage of the project?

Provide a clear outline of the business rationale to digitize records, including:

- Identification of business drivers,
- Objectives,
- Scale,
- Size, and,
- Constraints of the project.

If the DPM is being written for an already existing project, this information is still important and should have been gathered when the project was first implemented. Gather any information that exists by reviewing existing documentation and interview long-term project stakeholders, if necessary. It is highly recommended that any gaps be filled through further business analysis or a gap analysis comparing the details in this DPM guide to what has already been completed and documented for the project.

6.2 Records Management Issues

In considering how digitization fits into your ministry’s information management plan, review these questions and document the relevant responses.

- What are the intended uses of digitized business records?
- What are the physical characteristics of the original records collection (refer to Document Selection section)?

Throughout the planning and implementation phases of a digitization project, the following records management requirements must be taken into consideration to ensure that they are being met for both the original records and the digitized records. For already existing projects, review the list and ensure that all items have been considered in the context of the project. Any relevant items must be implemented and/or documented.

August 2016

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Digitization Procedures Manual Guide

- Establishment of the digitized record as the business record
  - The DPM should outline the requirements for the creation of digitized business records. Retention and Disposition Schedules still apply to the original records and must be adhered to. The length of time that original records must be retained after they have been digitized may vary, depending on the records content and business value.
  - Types of records that can be replaced by digitized business records are specific and limited, because of legal, business or records management requirements. It is imperative that the business unit confirm that their records fall within these parameters before beginning the digitization project and disposing of original records.

- Information and records classification schema

- Requirements to manage the lifecycle of the digitized records
  - Digitization of archival records and creation of metadata represent a significant investment in terms of time and money. It is important to realize that the protection of these investments will require the active management of both the image files and the stored metadata.
  - If the digitized record has a long-term or permanent retention, the ministry must be prepared to maintain the records indefinitely in an electronic format. This means that the ministry must not only have electronic storage space, but will also have a schedule for migration and/or conversion of the records as technology changes.

- Retention and Disposition Schedules/Plan
  - Digitized business records retain the retention schedule they had in their original format. Before beginning a digitization project it is important to have the record series scheduled and the retention approved because the approved retention must be built into the project from the outset.

- Legal restrictions, legislation, rights management and privacy hold processes must be considered for compliance and preservation

- Litigation considerations
  - As this DPM primarily addresses the creation of digitized business records, original records will likely be destroyed. If litigation is likely, Justice and Solicitor General recommends the use of one-page TIFF (See Digitization Technical Requirements Standard A000013, Digitization Process Standard A000015, and Court of Queen’s Bench Civil Practice Note 4)

- Rights Management
  - Federal law determines copyrights, trademark and patents, which protect original, creative works done by individuals and corporations.

- Before beginning a digitization project, establish which objects belong to the GoA, which objects are in the public domain and which objects will require permission from the copyright holder. If objects that are copyrighted must be included in the digitization project, consult with your records management and legal teams to determine the most appropriate way to include them and the best practices for obtaining permission to include the records. Long term preservation assessment, if applicable

6.3 Risk Analysis

Ministries need to consider the impacts and risks of both continuing with and not going forward with a digitization project. Risks that should be considered may include:

- Potential impacts of not digitizing
- Executive sponsorship and support for the project
- The level of analysis completed by program units when defining existing processes and identifying issues

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• Implementation of new systems
• Levels of user adoption
• Meeting timeframes of business requirements
• Meeting audit and compliance standards
• Level of governance structure
• Impacts to user access and security
• Staffing requirements
• Costs associated with not digitizing records
• Liability because of inappropriate treatment of records, and associated cost of e-discovery

Risks and critical success factors should be discussed and documented in the DPM, even if the DPM is being developed for an already existing project. Documentation should include the risk analysis, justifications for accepting a defined level of risk, and plans for mitigating identified risks.

6.4 Outsourcing vs. In-House

There are pros and cons both to outsourcing and to creating in-house capabilities for digitization projects. Even though a project may be outsourced, the ministry will still be required to support many aspects of the project including the long-term maintenance of the digitized business records and the appropriate management of the source records.

Outsourcing is viable if the Ministry has a good understanding of the near- and long-term goals of the digitization initiative, and can fully specify digitization, metadata, and derivative requirements; adopt policies and procedures for various functions; and define ministry and vendor responsibilities.

For existing projects, it is typically more efficient to continue with the current decision (in-house or out-sourced), however, it is always good practice to review the decision. Changes in processes, related or similar projects, changes in technology, etc. are all factors that may make new practices more feasible.

<table>
<thead>
<tr>
<th>Outsourcing</th>
<th>Advantages</th>
<th>Disadvantages</th>
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<tr>
<td></td>
<td>• Cost containment: ministry pays for deliverables, usually a set price/image, which facilitates project planning and budgeting.</td>
<td>• The ministry is removed one step from the digitization functions and has less control over digitization process, quality control; services most often performed offsite.</td>
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<td></td>
<td>• Economies of scale: vendors can handle large volume and high output.</td>
<td>• Vulnerability due to potential vendor instability.</td>
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<td></td>
<td>• Broad range of options and services available, including digitization, metadata creation, processing, encoding, derivative creation, printing, storing, backup, and database development.</td>
<td>• Potential vendor inexperience with needs of the GoA.</td>
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<td></td>
<td>• High production levels.</td>
<td>• Challenges in communication, from Statement of Work (SOW) development to contracting, to production and quality requirements.</td>
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<td></td>
<td>• On-site expertise.</td>
<td>• Security, handling, and transportation issues.</td>
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<td></td>
<td>• Vendor absorbs costs of technology.</td>
<td>• Complex contractual process: digital record specifications must be clearly defined up</td>
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<td></td>
<td>• Potential reduction of obsolescence,</td>
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### 6.5 Cost-Benefit Analysis/Return on Investment/Budget Identified

Ministries initiate digitization projects primarily to increase efficiency and productivity through ready access to documents and information. A cost-benefit analysis ensures that the proposed digitization project is feasible and valuable.

In doing a cost-benefit analysis, it is important to consider the following:

- **Efficiencies and productivity increases**: Efficiencies are gained primarily in saving of staff and/or client time. This could be quantified by calculating the staff hours saved and projecting those savings against the cost of the scanning project. As an example:
  - The time saved in finding, compiling, and retrieving files and information

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Document rationale for digitizing business records in-house or by outsourcing based on advantages disadvantages defined in the table below.

<table>
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<tr>
<th>In-House</th>
<th>Failure, downtime, etc.</th>
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<td></td>
<td>• Pay for cost of digitizing the record only. Equipment and/or most staffing costs are absorbed by the vendor.</td>
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<td></td>
<td>• Development of digitization project experience and exposure to technology and techniques is gained through the digitization project and may be transferable to other projects (project management, familiarity with technology, etc.).</td>
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<td></td>
<td>• More control over the entire digitization process, as well as handling, security and storage of both source records and digital records.</td>
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<td></td>
<td>• Direct participation in development of digitized business records that best suit the ministry.</td>
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<td></td>
<td>• Flexibility to alter project requirements and digitization parameters as the project develops.</td>
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<tr>
<td></td>
<td>Requires large initial and ongoing financial investment in equipment and staff.</td>
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<td></td>
<td>• Longer time needed to implement digitization process and technical infrastructure.</td>
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<td></td>
<td>• Limited production level.</td>
</tr>
<tr>
<td></td>
<td>• Staffing expertise not always available.</td>
</tr>
<tr>
<td></td>
<td>• Ministry must accept costs for network downtime, equipment failure, training of staff, etc.</td>
</tr>
<tr>
<td></td>
<td>• Need to enforce standards and best practices.</td>
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Time saved in researching information that may be located in several different offices or regional centers
Cost savings through reductions of mailings and phone calls between offices
Better quality of work product because of access to more reliable information
Clients would be served faster and provided with more complete information

Cost considerations: Initial investment in equipment, staff training, capture and conversion, handling and storing originals, producing derivative files, indexing, building the digital record database system and developing web interfaces are all possible areas of cost for any digitization project. These types of costs fall into more general cost areas such as:

- **Direct expenses**, which include: staff salaries/wages and benefits; management overhead; equipment and software; supplies; services and contracts; maintenance, licenses, copyright clearances and use fees; communication fees; and, replacement costs.
- "Ramp-up" costs, which can be considerable, especially for first time projects or those involving untested methods. These costs include: developing RFPs; establishing workflow processes and documentation; system configuration; training; and, other expenses incurred by the organization prior to project launch.
- Contingency to cover unanticipated expenses and will vary from project to project, depending on complexity, staff experience, and size of effort.
- **Indirects/overhead** includes space, utilities, services, and general and administrative support.
- "Hidden" costs, which can include costs associated with supporting digitization projects out of other projects or programs. Under-reporting such contributions convey a false sense of project costs.

Some strategies to assess the budget requirements are:

- **Match the capacity of the equipment to the overall size of the project.** Do not overbuy, but assure the equipment is scalable to accommodate any new or expanded projects. Future needs of the agency should be considered to determine if the digitization project will expand into an enterprise system.
- **Take a representative sample of the documents and develop procedures for document preparation.** This will include sorting, if required, and removing extraneous material such as staples, etc. From this review, a determination can be made as to time and costs involved.
- **Image capture time can also be determined by using a sample of documents and actually scanning them into a similar system.** If outsourcing, the vendor should be able to provide estimates.
- **The description, indexing, and development of finding aids for the material is very time consuming and costly.** This should be well-planned out to achieve the desired end results of efficiencies or added value to the information system.
- **Network infrastructure, computer storage space, and maintenance contract costs should be spelled out and included in the overall costs of the system.** Consult the ministry’s IT resources prior to and throughout the duration of a digitization project, as necessary.
- **The eventual cost of migration of hardware and software to new systems should be taken into consideration.** Eventually this will need to be done to upgrade and maintain the integrity of the system.
- **Digitization of archival records and creation of metadata represent a significant investment in terms of time and money.** It is important to realize that the protection of these investments will require the active management of both the image files and the stored metadata.

It is difficult to predict how much a digitization project will cost, much less, the cost to maintain the records and make them accessible. Available figures vary tremendously with the types of material being scanned, image conversion, indexing requirements, hardware/software used, and the range of functions covered in the calculations.

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Upfront and ongoing costs can be significant, and economic advantage may be better realized through collaborative initiatives or cooperative/regional digitization initiatives, where costs, resources, goals and expertise can be shared.

It is important to remember that the costs of a digitization project do not end after conversion. Some ongoing costs that must be committed to include the costs of maintaining data and systems over time, including media migration, infrastructure, the business continuity, backup and storage requirements and associated technology costs.

For already existing projects, refer to any cost-benefit documentation previously done. It may also be pertinent to review the cost-benefit of continuing the project in its current state, to look for areas of cost savings that were not previously identified.

### 6.6 Recommend Solution

After a full analysis is completed, a recommended solution should be documented. If changes are made during the project’s implementation, they should be documented with their justification to show where and why the project is different from the recommended solution.

For projects that already exist, reference to when stakeholders decided on the project’s scope and note the process that was followed. If documents (reports, meeting notes, emails, etc.) outlining the justification for the decision exist, they should be referred to and either stored with or linked to project documentation.

The use of external service bureaus to undertake all or part of a digitization project’s operations may be considered. Ministries are strongly encouraged to use authorized service bureaus from the list of approved digitization services bureaus maintained under the Digitization Services and Resources Standing Offer List (PQR CORP-446). The PQR and its updates are on the Alberta Purchasing Connection (APC; [http://www.purchasingconnection.ca/](http://www.purchasingconnection.ca/)). You can view the posting by searching for either the PQR number (PQR CORP-446) or the APC opportunity number (AB-2011-04650). External service bureaus performing services for GoA on behalf of Service Alberta will be held accountable for adherence to relevant standards, policies, and guidelines, as outlined in PQR CORP-446. Service bureaus are required to submit to measures taken by the department to assure this adherence.

### 6.7 Staffing and Project Team

By nature, digitization projects require a team approach, bringing together diverse sets of skills from different areas of the organization, perhaps more than any other project. Administration, technical services staff, records managers, classification specialists, the information technology department, subject matter experts, and others may all be involved.

Digitization projects require a combination of skills from a variety of staff with different areas of expertise. The following areas and skills may be important to any digitization project:

- Project management skills

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• Knowledge of taxonomy, registration methods or metadata schema
• Familiarity with conservation methods
• Understanding of photographic techniques and methods
• Subject matter experts
• Database development and administration skills
• Computer programming skills
• Web design and development skills
• Artistic/graphic design skills

Depending on the size of the project, project staff and their roles may include:
• Project Manager
• Business Analyst (particularly those working in information management)
• Metadata Analyst
• Records Manager
• Scanning Technician or Photographer
• Quality Control Technician
• Programmer or other Database Developer
• Systems Administrator, Network Administrator, and/or Database Administrator
• User Interface Developer or Designer

It is highly recommended that each digitization project have a key contact that can act as a bridge between different groups of stakeholders. In most cases, this would be the Project Manager, however, for smaller projects, this may another team member. In many cases, this role will be tasked with ensuring stakeholders are connected and/or that any changes made are communicated to the rest of the team, so that they can make appropriate adjustments to their processes and procedures. For example, if a new scanner is installed, IT may need to be contacted so that they can adjust settings.

6.8 Communications Plan

Where applicable, document any existing communications plans. This could be as simple as listing the primary contacts for specific business units, areas of expertise, or issues resolution. For already existing projects, many of the lines of communication are built into the day-to-day business processes, but it is still important to list contacts (the applicable role or position title), document regularly scheduled project meetings, etc. This assists in continued success of the project, even if there is staff turnover.

Internal
To optimize the success of the digitization project, it is recommended that all relevant staff are consulted in the project planning process, as well as the implementation phase and as the project progresses. Decisions made, issues raised, and resolution of concerns should all be documented in writing, through meeting minutes or summaries, with process/product decisions documented in the DPM.

Vendor / Consultant (where applicable)
Regular communication is critical when dealing with outside service providers. It is necessary to ensure a high level of production quality and to help anticipate challenges that may arise. For outsourced projects, it is recommended that a communications plan be formalized.

August 2016
http://www.im.gov.ab.ca/
External
Depending on the size and scope of the project/program, a communications plan may be required to communicate with staff in other business units or ministries or with the public.

6.9 Errors Planning and Reporting of Errors

For exceptions and/or problem resolution reporting (such as security breaches, damage to original documents, theft, etc.), the incident must be reported to the appropriate project team member (e.g. the project lead) within 24 hours. Full details of any exception or problem must be fully documented within five business days. Relevant details include: the nature of the problem, when it occurred, how it was resolved, etc. A detailed error reporting and resolution plan - including who to contact and what details should be included - should be documented and shared with all relevant stakeholders (including front line staff, who will need to be trained in error handling).

Anticipated exceptions, such as known cases where records must be handled differently because of business practice or restrictions based on the format or content of the records, can be documented in this section, the Document Selection section (section 7.1), or the Preparation of Original Documents section (section 7.2). It is up to the ministry to determine the most appropriate section and to ensure that all exceptions are documented.

6.10 Training Requirements

Training requirements may include:

- An overview of the proposed digitization program and how it addresses records management and legal obligations
- If staff is involved in the scanning process, training around document preparation, scanning and optimization techniques as outlined by the ministry
- Training for new procedures for day forward processes

If the project is in-house, sufficient time for training and opportunities to receive further education need to be provided to ensure staff have the necessary skills to adequately execute the project.

6.11 Program Overview

Give a brief description of the digitization project. Include high level specifications and details, the estimated number of records, output format, resources or equipment needed, timeline, estimated budget, etc. This information may already be defined in the sections above, but may be helpful to consolidate it all on one location. Think of this section as a summary of the project specifications.
7.0 PROCESS

7.1 Document Selection

Documents selected for digitization should be chosen based on intended uses, document attributes, preservation considerations, and available technical infrastructure:

1. Intended Uses/User Requirements:
   - Increased business efficiency for active records
     - Is there a clear understanding of user requirements? Can digitization support these uses?
     - Is the document used frequently? Daily, weekly, monthly?
     - Is rapid access required? Will there be significant benefits from rapid access to the documents? Improved customer service or workplace productivity?
     - Are the documents updated frequently during the active stage of the lifecycle?
     - Does digitization streamline business processes? Are the documents difficult to process in paper form?
   - Legal restrictions
     - Is the material restricted because of privacy, content, or litigation concerns?
     - Is it copyright protected?
   - Additional value
     - Is value added through the provision of online access?
     - Are the documents strategically important to the achievement of key business objectives?

2. Document Attributes
   - Suitability for digitization
     - Does the material lend itself to digitization?
     - Can the informational content be adequately captured in digital form?
     - Are the physical formats (e.g. size) and condition of the material (e.g. tears, fragility) acceptable for digitization, or will special handling be required?
     - Are intermediates, such as microfilm or slides, available and in good condition?
     - Do accommodations need to be made? Specialized scanners, etc.?
     - How large and complex in terms of document variety is the project?
   - In assessing suitability for digitization, consider major influencing factors that may cause difficulties, such as:
     - Weight (tissue, carbon, card stock, etc.);
     - Size (e.g. may need a specialty scanner for some larger sized documents or may need special handling for some smaller sized documents);
     - Condition (e.g. creased, stapled, rolled, brittle, etc.);
     - Orientation (e.g. may need to rotate the original or the digital record);
     - Unique finishes (e.g. transparent, semi-transparent or opaque);
     - Binding;
     - Colour;
     - Embossing (usually in the form of seals); and,
3. Preservation Considerations
   o Would the material be put at risk in the digitization process?
   o Would digital surrogates reduce use of the originals, thereby offering them protection from handling?
   o Is the digital reproduction seen as a means to replace the originals?

4. Technical Infrastructure
   o Are the proposed materials able to be adequately accommodated using existing technology?
   o Is there new technology, not yet available, that would increase the value of the digitization project?
   o Will existing technologies limit the value of the documents in the course of their lifecycle?

Document the rationale for Document Selection either using these questions or unit specific criteria to frame the section. The assessment results must be documented within the business analysis to assist with determining digitization feasibility. This information must also be documented for existing projects.

Changes over time (if certain document types or records series were added or removed from the project scope) should also be defined and the reasons for their inclusion or exclusion should be documented. This helps with tracking changes over time and may be important information in case of litigation.

7.2 Preparation of Original Documents

Document preparation is the process where documents are examined and prepared for digitization. There can be many processes involved. The table below outlines a number of these processes.

The proper preparation of documents is necessary to ensure the highest quality of digitized images. Source records should be prepared for capture in accordance with ANSI/AIIM TR15-1997, Planning Considerations Addressing Preparation of Documents for Image Capture.

<table>
<thead>
<tr>
<th>Document preparation level</th>
<th>Document preparation activities</th>
</tr>
</thead>
</table>
| Level I                    | • Remove document(s) from file back, file folders, etc.,  
|                            | • Insert document header sheet,  
|                            | • Remove all staples, paper clips, pins, etc.,  
|                            | • Confirm header toggle page is complete with all necessary information, and,  
|                            | • Place all landscape documents with the head of the document in one direction. |
| Level II                   | All Level I requirements plus:  
|                            | • Place document files in chronological order (specifications may be defined in the SOW),  
|                            | • Confirm all necessary fields are completed on a batch header that a Purchaser creates,  
|                            | • Placement of all information header pages, |
### 7.3 Conversion

#### 7.3.1 Image Capture (Scanning) Procedure

This refers to the process of scanning or otherwise capturing an electronic image of the original document. Document the digitization specifications, such as: pixel density, image type, compression, color bit depth (if necessary) and output format (for minimum standard for digitized business records, please refer to the [Digitization Technical Requirements Standard, A000013](http://www.im.gov.ab.ca/)).
7.3.2 Quality Control of Image Capture Process

Quality Control must be considered and implemented throughout the digitization phases: Image capture (scanning), Image re-capture (re-scanning), Quality Assurance, and Data Transfer. The specific checks and any project specific standards or tolerance thresholds within the Quality Control processes must be documented for each phase. Project specific standards for the digital records created must be clearly defined and documented prior to the commencement of the digitization project so that image digital record quality can be evaluated.

Quality Control implemented after the Image Capture (Scanning) phase is to reduce the risk of insufficient image quality and may include:

- A count of the prepared documents must be compared and matched with the number of documents digitized
- The number of pages of a digitized multi-page document must be compared and reconciled with the number of pages in the original document
- If multiple documents are digitized in a single batch, capability to separate individual digitized documents must be assured
- Confirming the completeness and accuracy of detail by ensuring the source document content has been captured in its entirety in the digitized version (e.g. overall readability, clarity of punctuation marks or smallest type size for text, etc.)
- Looking for the presence of scanner generated speckle (i.e. speckle not on original document) and mitigating as needed (e.g. it may be because of a dirty scanner bed)
- Density of solid black areas
- Colour fidelity
- Page alignment
- Minimum point per inch (ppi) specification achieved (for minimum standard for digitized business records, please refer to the Digitization Technical Requirements Standard, A000013)
- Removal of blank pages
- Is the final image type (e.g. black and white, colour, or greyscale) appropriate
- Is the output format (e.g. TIFF, PDF, etc.) appropriate
- Is the compression type (e.g. lossy or lossless) appropriate

Quality Control specifications for indexing are discussed in Section 7.4.1, Quality Control of Indexing.

Note: Any enhancements of the image (e.g. despeckling, deskewing) must be used with caution as they may be deemed as altering the original document by the courts.

7.3.3 Image Re-Capture (re-scanning) Process

Image Re-Capture (re-scanning) is implemented only when the quality fails the Quality Control or Quality Assurance checks. If the digitized images require a re-capture, then the re-captured images must proceed through Quality Control and, where applicable, Quality Assurance again.

Source records must be available for retake until the images have passed the Quality Assurance stage.
Images must be re-captured using the same specifications and process as the original image capture. Document detailed information about re-capture procedures, including, but not limited to: when and why documents will be re-scanned, how new digital records will be re-integrated into the image collection, etc.

### 7.4 Indexing

One of the most important and often overlooked components of a digitization project is the attention paid to applying useful indexing or metadata to the image collection. If images are not tagged appropriately, then end users may not be able to find a specific document easily and managing the collection becomes infinitely more challenging over time.

As noted in the Digitization Process Standard A000015, the digitization process includes four phases where indexing must be applied: Image capture (scanning), Image re-capture (re-scanning), Quality Assurance, and Data Transfer. Metadata may be used as a means of indexing electronic records.

Metadata has 4 main functions:

1. **IDENTIFY content** - Provides unique characterization distinguishing content/images. For example: Unique resource identifier (URI), Filename of File reference number, Creator, or Title.

2. **MANAGE content** - Allows systems to manage content/images. For example: Version date, Security and access permissions, Retention schedule, or File Format.

3. **RETRIEVE content** - Help user to find and retrieve content/images. For example: Taxonomy topics (Classification), Subject keywords, or Document descriptions.

4. **TRACK usage of content** - Provides metrics (example: usage statistics). For example: User ratings, Downloads data, or Links data.

Refer to the Digitization Technical Requirements Standard A000013 and the Indexing Field Descriptions support document (RIM0007) for more details and minimum indexing requirements.

When documenting the indexing process, include the following functional requirements:

- The specification of the indexing methodology and schema used
- A list of mandatory fields (based on current standards and ministry requirements), including the format and the content of all mandatory fields
- The methods for performing Quality Control of indexing
- The procedures in place to amend inaccurate index data
- The procedures for performing Quality Assurance of the indexing
- The procedures for the regular checking of computer system clocks for accuracy concerning date and time keeping should be documented, as well as all actions taken concerning error correction or resetting of system clocks
- The procedures for rebuilding an index, changing an index structure, and recovering a damaged or faulty index. This and the results of any such events must be authorized and documented.
7.4.1 Quality Control of Indexing

The Quality Control phase is implemented after the indexing phase to reduce the risk of inaccurate Indexing.

The following should be considered and documented:

- Minimum quality levels or threshold covering accuracy and completeness of captured data must be specified
- The specific checks of Quality Control of Indexing must be documented
- The process to ensure Quality Control of automated (system generated) Indexing must be documented and automated modifications of system generated indexing should be carefully reviewed as any changes to the indexing could reduce the reliability of the indexing (it is recommended that automated modifications be disabled).

7.4.2 Re-Indexing/Index Corrections

Re-indexing is implemented only when index quality and accuracy fails Quality Control or Quality Assurance. If the Indexing requires corrections, then the indexing must proceed through Quality Control and, where applicable, Quality Assurance again.

Source records and their associated indexing information must be available until the indexing applied to the digital images has passed the Quality Assurance phase.

Indexing must be corrected using the same specifications and standards as applied in the original indexing.

Document detailed information about re-indexing procedures, including, but not limited to: when and why documents will be re-indexed, how new indexing will be re-integrated into the system/collection, etc.

7.5 Quality Assurance Requirements

Quality Assurance is the process of verifying or determining whether digitization quality and associated indexing within a digitization project meets expectations. Quality Assurance should be conducted by personnel not directly involved in the digitization or indexing of documents and may be conducted by an independent third party if required. This level of quality review is above the normal Quality Control deployed as part of the digitization process.

Refer to Digitization Process Standard A000015 and support document RIM0004, Digitization Quality Assurance, for minimum Quality Assurance recommendations.

Quality Assurance is the process of verifying or determining whether digital record or indexing quality within a digitization project meets or exceeds expectations. The quality assurance ratio, as defined in RIM0004, Digitization Quality Assurance, is the number of digitized records and the associated indexing checked against the physical count of original documents. A designate from the program area is responsible for ensuring that all aspects of the digitization process meet specified program area requirements. The designate is responsible for documenting the implemented procedures, including the process to amend inaccurate Indexing or imaged with unsatisfactory quality (i.e., images or indexing that have failed the Quality Assurance testing).

The steps to determine the quality assurance ratio to implement are:

August 2016

http://www.im.gov.ab.ca/
Digitization Procedures Manual Guide

- Determine the volume of documents that needs to be digitized—this is the physical count of records and the number of pages contained in each record in the entire record collection. Double-sided documents count as two pages.
- Determine probability of litigation—the probability of litigation or pending discovery can be determined by reflecting upon events that occurred within the previous five years, including existing litigation, threatened litigation, or known incidents that may lead to litigation.
- Define the service level (allowable error percentage)—a recommended practice for allowable errors is 99.9% for both image and indexing accuracy.
- Define what constitutes as an error—to do this, identify the acceptable deviation of quality (e.g., for images, what is the acceptable deviation of quality from the original format to the digitized format). When the original document is of very poor physical quality then the digitized image will also be of very poor quality. Images generated from poor quality originals must be identified as such (e.g., with a “poor quality original” stamp). Errors arise in the following areas: metadata accuracy, image accuracy compared with the original, color fidelity, minimum point per inch (ppi) specification, image type, compression type, and file format.
- Set a benchmark for errors (perform benchmark testing)—do this by performing Quality Assurance at a ratio of 1:1 for a subset of the record collection. Many business areas choose to do this by conducting 100% Quality Assurance on the first boxes or sets of records that are scanned in a digitization project. The total subset size for Quality Assurance is usually 5-10% of the total volume that will be digitized. The benchmark incorporates checks for both image and metadata and confirms the error criteria.
- Examine benchmark results—If the benchmark testing results in an error ratio greater than 99.9% in your subset (one error within a set of 1,000 images), then re-exam the process implemented for the Document Preparation phase and incorporate more stringent digitization process requirements. The Document Preparation phase corrects problems with the physical records that may cause scanning difficulties.
- Reduce the quality assurance ratio—If the benchmark testing results in an error ratio less than 99.9% (one error within a set of 1,000 images), then reduce the quality assurance ratio. Keep in mind that the quality assurance ratio must take into consideration the probability of litigation. If there is a high probability of litigation, then the recommended practice is a ratio of 1:100 (one error within a set of 100 images) for the duration of the digitization project. Document the quality assurance ratio and the reasoning for implementing the desired ratio.

When logging Quality Assurance testing, provide detailed information, including, but not limited to:
- The batch reference (for batch input), the Quality Assurance operator
- The quality Assurance check/testing approval date
- The percentage of Quality Assurance
- How Quality Assurance will be implemented (e.g., random selection, specific boxes or files, etc.)
- What is being monitored above the normal Quality Control (e.g., Metadata/indexing, readability, etc.)
- The process to amend inaccurate metadata or unsatisfactory quality images (i.e., the re-capture or re-indexing processes, as defined in sections 7.3.3 and 7.4.2, respectively)

7.6 Storage

Once a digital record is deemed as final, it must be moved to secure storage immediately. Digitized images and indexing may be moved to temporary storage before they are moved to their final storage location. The same security and IT policies apply to both temporary and permanent storage.

August 2016
http://www.im.gov.ab.ca/
Depending on the project requirements and legal or records management policies, some digitization processes may require a certification step where the digital records (including indexing) are certified as being complete and correct before they can be deemed as final and moved to storage.

When digital records are moved between storage devices, the mandatory indexing properties must also be populated, migrated and stored for at least as long as the digitized images. Also, keep in mind that well planned network design is critical to allow access to and protection of the digital objects and their associated indexing.

When choosing storage solutions, response times required by end users can affect the storage media used for digital records. For example, if DVDs are used as an offline storage media, the retrieval or response time for a user to receive a copy of the requested digital records will be at least partly dependent on the hardware loading the relevant DVD onto the system. This timeframe may be too long for the purpose of the query.

If the digital record is the business copy and the record has a permanent retention, the Ministry must be prepared to store and maintain the digital records in an electronic format for as long of the records’ retention policy dictates, which could be indefinitely. This means that the ministry must have storage space and a schedule for migration and/or conversion of the digital records as technology changes.

Some of the considerations that should be documented include, but are not limited to:

- Whether digital records will be moved to temporary or permanent storage. If so, defined the timeline for transfer to permanent storage
- If applicable, document certification of digital records as being complete and correct
- Document security and IT policies and directives followed in the storage of the digital records
- Document storage requirements and accommodation for indexing properties
- Defined the storage solution/type and rationale
- Review and define the most appropriate structure for the digital repository to eliminate duplication of information and privacy or litigation concerns

### 7.7 Delivery/Transfer

All electronic transfers, including those between an external digitization vendor and the GoA, must be done in accordance with GoA and ministry specific security and IT policies and directives.

Procedures for the delivery and/or transfer of digitized business records and source documents must be considered separately, as requirements vary depending on the type of document (e.g., whether they are electronic records or source documents).

For Digital records:

- Document the processes for the transfer of digital images, indexing and all process logs to secure storage
- When any transfer is implemented, document the transfer date, locations (transferred from and transferred to), and transfer operator
- Define and implement Quality Control of the transfer process. To ensure the integrity of the data being moved, data migration or conversion procedures must include: data testing, validation, and final sign-off by a
representative of all stakeholders (e.g., an authorized person or position within the organization) and any agent providing migration or conversion services

- Define disposal of digital records from secure storage: Like paper records, digital records must be appropriately scheduled with clear requirements for disposition. Scanned documents which replace the source documents as the business record may retain the same retention and disposition rules of the source business records, but the Records Retention and Disposition Schedule should be reviewed. Before beginning a digitization project, it is important to ensure that the record series is scheduled and the retention approved because the approved retention should be built into the project from the outset (e.g., the secure storage solution should be designed to allow for efficient records retention based on the retention and disposition rules applied to the records it contains).

For Source Documents:

- Document procedures for the transportation, receipt, confirmation and logging of source documents (whether being sent to an external vendor or a different section/building with the GoA)
- When any transfer is implemented, document the transfer date, locations (transferred from and transferred to), and transfer operator (e.g., who couriered or transported the source documents)
- Document the procedures for the return of source documents (whether being sent to an external vendor or a different section/building with the GoA)
- Define the appropriate disposal of source documents, keeping the following in mind:
  - Source records must not be disposed of until the Quality Assured digital records and associated indexing have been accurately and completely transferred from temporary transitional storage to secure storage.
  - Source records must follow their approved Records Retention and Disposition Schedule requirements, even after the digitized business records and associated indexing have been Quality Assured and transferred to secure storage.

For both digital records and source documents, it is prudent to outline all GoA security and IT policies and directives that were followed in the transfer process.

8.0 CONSIDERATIONS THROUGHOUT PROJECT

8.1 Physical, Administrative and Personnel Security Procedures

The digital environment for the storage, transfer and maintenance of digital records and their associated indexing must meet the requirements outlined in the GoA’s Security Directives and Information Security Policies. This also applies to the service bureaus and/or infrastructure used for the storage, transfer and retention (temporary or permanent) of source records.

8.2 Technical Considerations

Refer to Digitization Technical Requirements Standard A000013 for minimum technical requirements.
Technical infrastructure decisions require careful planning because digitization technology changes rapidly. The best way to minimize the impact of depreciation and obsolescence of software and/or hardware is through careful evaluation and the avoidance of unique, proprietary solutions. Interoperability with other digital environments (e.g., with other electronic content management software solutions) is required in case of projects merging or government reorganizations. If equipment choices are well-matched to intended uses and expected outcomes and are synched to realistic timetables, return on investment will be maximized. It is important to make technical decisions in consultation with the IT department and repository/database manager.

When creating digital records, take into consideration what constitutes a record. Best practice is to maintain records at the document and not the file level. A record maintained at the document level ensures that document can be destroyed at different times (e.g. personal information can be destroyed according to FOIP retention and disposition schedules and not for the life of the entire file, which may be considerably longer).

Document all technical aspects, including but not limited to those outlined in the Digitization Technical Requirements Standard A000013. It may also be relevant to document aspects such as: modes of capture, bit depth, colour space, resolution, tonal dynamic range, scaling, etc.

For hardware, some considerations that should be reviewed and documented include: scanner instructions, testing, cleaning, and maintenance (e.g., who to contact, maintenance logs, etc.). Any specific hardware requirements (e.g., specialty monitors or servers) should be documented along with the justification for their use. The same applies to software being used for the project and/or the electronic content management system. Documentation of research completed and justification for final choices regarding hardware or software options should be included.

If there are any ministry or project specific standards or minimum requirements that are above those set by the GoA standards (e.g., the Digitization standards), they must be defined and documented.

### 8.3 Preparation and Retention of All Audit Logs

To ensure that there is the ability to review phases, track documents and processes, and provide an auditable trail, logging should be implemented throughout the digitization process.

Process logs must contain sufficient and necessary information to provide evidence of the authenticity of stored records. If the authenticity of stored records is questioned, the integrity of the process logs may be fundamental in establishing the authenticity and, therefore, the evidentiary weight of the stored records.

When preparing digital records for use as evidence, it is necessary to detail the exact processes the record moved through, including but not limited to:

- storage date of the records and associated indexing
- movement of the records and associated indexing from medium to medium
- evidence of the controlled operation of the records management system
- system-generated and operator-generated logs containing data about changes to the stored records
- process log records
- content of audit trails
- creation of the records and associated indexing
• date and time of any and all changes to the records and associated indexing
• storage of the records and associated indexing (e.g., location)
• access to the records and associated indexing
• security and protection
• data migration and conversion
• workflows associated with the records and associated indexing
• Quality Control and Quality Assurance of the records and associated indexing

9.0 Process for Updating this Manual

The DPM must always be up-to-date because it is the most persuasive evidence of the ministry’s usual and ordinary course of business with regards to the digitization project. Changes in the system, process and/or procedures must be documented in the manual with the appropriate authorization and must be made prior to the implementation of the change.

Any updates or changes relating to unexpected changes must be made within five (5) Business Days of the change. The manual must have a formal review cycle to ensure ongoing alignment with other organizational requirements.

For minor changes, an appendix noting what was changed may be sufficient, but for major changes, previous versions of the DPM should be retained as business records. The ministry should consult with their legal team to determine the importance of retaining a record of past practices and reasons for any changes made. Maintaining a record of processes, standards, and policies used in the past may be important in proving the admissibility of electronic records in court as it shows that the ministry was following defined procedures and best practices at the time that the original record was scanned, regardless of whether the procedures meet current standards. Documenting which version of the DPM applies to which projects and/or parts of projects is imperative.

For both major changes to the DPM and formal reviews, sign-off may be required because of internal ministry policy or the nature of the records being digitized. For example, it would be recommended that a senior project member or the ministry’s SRO be required to sign-off on any major changes or for each review when the records being digitized are deemed vital. This would act as a check point to ensure that all considerations have been addressed and that any edits made accurately and completely reflect changes that were made in the processes. A separate section or appendix can be added to include sign-off certificates or a sign-off log.

Keeping a log of changes is strongly recommended. It should include the date of the changes and who implemented them. It may also include a brief summary of the changes, justification for the changes and authorization.

References

The following are documents and standards that are relevant to the content in this guide and that may assist ministries in ensuring that their digitization project is efficient and effective:

• Digitization Process Standard A000015, Government of Alberta IMT Standards.
• Digitization Technical Requirements Standard A000013, Government of Alberta IMT Standards.

August 2016
http://www.im.gov.ab.ca/
• Metadata - Core Content Standard A0000XXX. Government of Alberta IMT Standards. Under Review.
• Preparation of Record Schedules for the Disposition of Imaged Sourced Records, October 2009
• Digitization Chain of Custody (RIM0001)
• Digitization Document Preparation (RIM0002)
• Digitization Program Required Documentation (RIM0003)
• Digitization Quality Assurance (RIM0004)
• Digitization Recommended Practice (RIM0005)
• Digitization Frequently Asked Questions (RIM0006)
• Digitization Indexing Field Descriptions (RIM0007)
• Digitization Program Business Analysis (RIM0008)
• CAN/CGSB-72.34, Electronic Imaged Records as Documentary Evidence,
• CAN/CGSB-72.11-93, Microfilm and Electronic Images as Documentary Evidence
• Court of Queen’s Bench Civil Practice Note 4 (https://albertacourts.ca/docs/default-source/Court-of-Queen’s-Bench/pn4technology.pdf?sfvrsn=0)
• ANSI/NISO Z39.19 - Guidelines for the Construction, Format, and Management of Monolingual Controlled Vocabularies
• ISO 25964-2:2013 - Information and documentation -- Thesauri and interoperability with other vocabularies -- Part 2: Interoperability with other vocabularies
• ISO 15836:2009 - Information and documentation -- The Dublin Core metadata element set
• ISO 2709:2008 - Information and documentation -- Format for information exchange