Digitization Guideline

FOIP and Information Management, Enterprise Information Management

Version: 1.0

Approved by: Anthony Lemphers, ADM, FOIP and Information Management, Service Alberta	**Owner:** Maureen Towle, Executive Director, Enterprise Information Management	
Approval Date: November 10, 2020	**Last Reviewed:** November 2020	**Review Date:** November 2022
Contact: Sa.InformationManagement@gov.ab.ca	**Policy Instrument type:** Guideline	

Contents

Guideline Statement

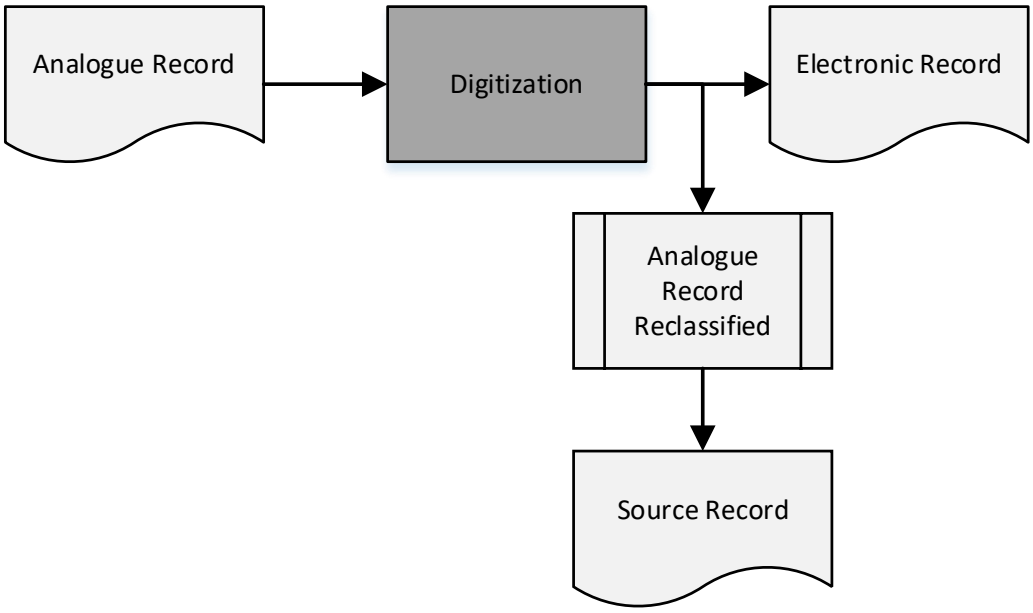
This guideline outlines the standardized process for the digitization of content in the custody and/or under the control of the Government of Alberta. The process detailed in this guide supports implementation of the Digitization Standard, and aligns with the Canadian General Standards Board (CGSB) 72.34-2017, Electronic records as documentary evidence standard established by the Government of Canada.

Authority

- *Alberta Evidence Act*
- *Electronic Transactions Act*
- *Government Organization Act*
- Records Management Regulation

Guideline Description

CAN/CGSB-72.34-2017, Electronic records as documentary evidence defines digitization as "the process of rendering analogue recorded information in electronic (digital) form". As demonstrated in the figure below, after the electronic records have been validated and verified as equivalent to the analogue records (e.g., determined to be accurate reproductions as part of a quality control process), the analogue records are reclassified as source records.



Business areas may want to digitize content (e.g., scan, image, etc.) for a variety of reasons, including (but not limited to):

- improving access for business users;
- preserving the quality of content over time;
- integrating physical content into digital processes (e.g., scanning a receipt into an electronic content management system for reimbursement); and
- adopting fully digital business processes.

If content is to be digitized for use by the government, it must be digitized in a manner that supports the creation of electronic records whose authority and reliability (as defined by the Records Management Program Standard) are demonstrable. Electronic records created in, or used by, the Government of Alberta must:

- meet business needs and evidentiary requirements (e.g., *Alberta Evidence Act*);
- be created in adherence with the Digitization Standard; and
- comply with appropriate quality assurance requirements.

Digitization can range from large-scale department initiatives involving thousands of records and specialized equipment, to a business area digitizing analogue records using a multipurpose printer/scanner, to a single employee using a smartphone's camera to take a picture.

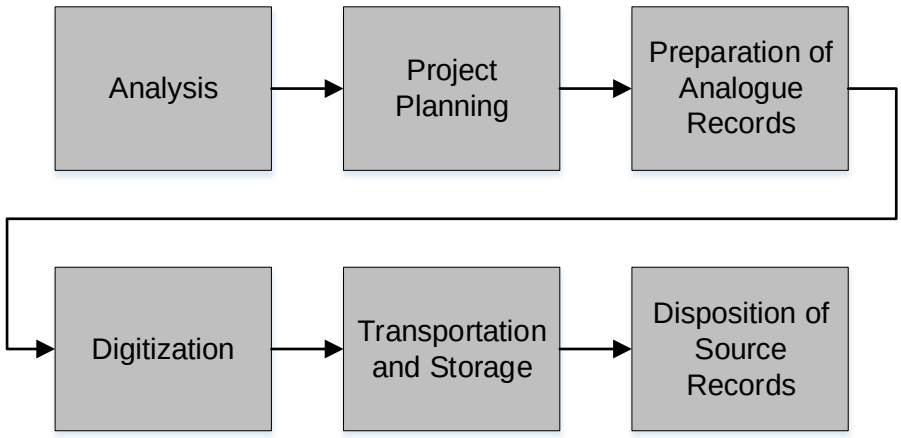
This guideline details the process that must be performed in any digitization project where analogue records (e.g., paper, photographs, audio/visual material, microform, etc.) are used to create electronic records—this includes (but is not limited to):

- formal digitization (e.g., large-scale digitization projects);
- informal digitization (e.g., work convenience digitization as part of a business process); and
- archival digitization (e.g., digitization for long-term preservation by an archival institution).

This standard details the minimum requirements for the Government of Alberta—department processes and policies should be reviewed for compliance. Business areas can develop enhanced digitization processes (e.g., technical requirements for archival digitization established by the Provincial Archives of Alberta) based on this standard, if required.

Guideline Specification

Digitization projects may be undertaken through a variety of methods and for a variety of purposes; the six phases described in this guideline support the effective implementation of the Digitization Standard. Business areas are encouraged to follow these phases during a digitization project, regardless of scale.



Phase 1: Analysis

Before starting a digitization project, it is important to determine if the project is both necessary and feasible. A business need and feasibility analysis must answer the following questions:

- What business need(s) would digitization address?
- Do the analogue records need to be digitized? Can a business process be modified instead?
    - For example, capturing information electronically using digital forms; requiring electronic receipts and invoices from vendors and/or contractors; implementing electronic signatures to eliminate the printing, signing, and digitizing of documents.
- Are there legislative restrictions to creating electronic records?
    - While the *Electronic Transactions Act* is enabling legislation that removes barriers to electronic commerce by ensuring that electronic records and transactions have the same validity and enforceability as traditional, paper-based transactions, there are some exceptions (e.g., wills and codicils, records that require a wet ink signature).
    - Depending on circumstances and the applicable legislation:
        - some electronic records may not receive legal recognition; and/or
        - the source records may need to be maintained.
    - Obtaining a legal opinion may be required, and is strongly encouraged.
- Have the analogue records been identified and assessed?
    - Depending on the situation, analogue records in the custody of a department may require the approval of the records' controller prior to digitization.
- What is the final disposition of the analogue records?
    - Any digitization project involving analogue records with the final disposition of "Archives" requires consultation with the Provincial Archives of Alberta (PAA).
- What is the projected duration of the digitization project?
    - Is the digitization project short-term (e.g., a project to convert some analogue records into electronic records as a space-saving measure), long-term (e.g., converting all analogue records to electronic records for archival purposes), or ongoing (e.g., a business process requires conversion of analogue records to electronic records)?
- What is the projected scope of the digitization project?
    - Is there a large volume of analogue records that will be digitized, or will the project involve "as-needed" digitization?
- What digitization methods are available?
    - Digitization of certain analogue records may require specialized equipment, preparation, etc.
    - Is there a preferred digitization method? Are alternative methods available if a preferred method is unfeasible?
    - Some considerations (e.g., staffing, digitization project timelines, software licenses, etc.) may dictate the appropriate digitization method.
- What risks are associated with digitization?
    - Is there financial information contained in the analogue records?
    - Do the analogue records contain any personally identifiable and/or sensitive information?
    - Has a Privacy Impact Assessment been performed?
    - Is there a potential for unauthorized loss or destruction of the analogue and/or electronic records?
    - What level of risk is acceptable?

    - Have the risks and potential mitigation strategies been identified?
- What are the costs associated with digitization?
    - A cost benefit analysis may identify more cost-effective options (e.g., only digitizing on a go-forward basis when necessary, digitizing analogue records with on-site retention, etc.), or demonstrate long-term savings versus maintaining analogue records.
    - Digitizing analogue records nearing the end of their retention period may result in a needless expenditure (i.e., developing and implementing a digitization project for analogue records that are almost immediately eligible for disposition).
- Are any of the analogue records currently, or reasonably expected to be, subject to information access requests and/or litigation holds?
    - Records that are subject to litigation holds cannot be altered in any way.

If the business need and feasibility analysis finds that the digitization project will meet desired business needs and completion criteria, then the business area can seek the appropriate authorization(s) to begin Phase 2: Project Planning.

Phase 2: Project Planning

Digitization projects require planning, authorization, and documentation. The degree of planning, authorization, and documentation necessary for a digitization project will vary from business area to business area, and from project to project—it is the responsibility of business areas to develop consistent internal processes to assist in the planning of digitization projects.

Questions that should be considered when planning a digitization project include (but are not limited to):

- What is the security classification of the analogue records?
    - Are there specific requirements that must be adhered to when handling the analogue records?
    - For more information regarding security classification, please refer to the Data and Information Security Classification Standard.
- What is the desired outcome of digitization?
    - How will the electronic records produced by a digitization project be used, accessed, and maintained?
- What metadata needs to be attached to the electronic records produced by a digitization project?
    - Indexing information and metadata must be applied to the electronic records.
        - For more information regarding metadata requirements, please see the Metadata – Core Content Standard.
    - A business area may determine that additional metadata must be attached to the electronic records produced by a digitization project; this may include (but is not limited to) metadata specific to the digitization process (e.g., metadata that captures information regarding the creation and/or transfer of electronic records).
        - Refer to **Appendix 1 – Digitization Metadata Elements** for more information.
- Will any of the analogue records require special handling?
    - Some formats may require specific and/or specialized handling (e.g., thick card stock with a unique finish, photo-reactive material, etc.).
    - Are the analogue records fragile, of an unusual shape and/or size, and/or made of an unusual material (e.g., onionskin paper)?
- What will happen to the source records after digitization has been completed?

    - Will the business area have access to the analogue records prior to verification of the electronic records?
        - Limiting accessibility could impact business continuity.
    - As per the Records Management Regulation, all records under the control of a department must be scheduled, and records may only be disposed of in accordance with an approved records retention and disposition schedule.
    - As per the Alberta Records Management Committee Circular 2009-01 – Disposition of Imaged Source Records, source records must be scheduled, managed, maintained, and disposed of as source records.
    - Source records are not transitory records.
    - Any records under an information access ("FOIP") and/or litigation hold cannot be destroyed until the hold is lifted.
    - Any digitization project involving analogue records with the final disposition of "Archives" requires consultation with the Provincial Archives of Alberta.
- Where and how will the electronic records be maintained?
    - Is the format of the electronic records open (e.g., PDF) or proprietary?
    - Does the system and/or application in which the electronic records will be maintained have the capability to institute holds for information access and/or litigation?
    - Does the system and/or application in which the electronic records will be maintained have the capability to restrict access permissions in alignment with security classification?
    - Does the system and/or application in which the electronic records will be maintained have the ability to locate, access, preserve, review, and produce records subject to legal and/or information access discovery?
    - If necessary, can the electronic record be recovered in an authentic, useable format for the duration of the record's retention period (e.g., if the system becomes corrupted, compromised, or otherwise unusable, will the records still be available)?
- When and how will the digitization process be tested, validated, and approved?
    - Will the digitization process be audited on a regular basis to ensure currency?
    - What sort of quality assurance and/or quality control requirements are necessary for the digitization project?
    - Will the systems and/or applications that will be used to maintain the electronic records be tested to ensure their suitability?
    - When and how will the devices used for digitization be appropriately tested?

Once a digitization project has been planned and authorized, a digitization procedures manual (DPM) must be created. The DPM is the central source for all information regarding a digitization project, including (but not limited to):

- the analyses from Phase 1;
- the planning questions asked at the beginning of Phase 2, and their answers;
- the history of the digitization project;
- actions undertaken to support the digitization project;
- key decisions and approvals;
- technical requirements;
- additional metadata requirements;
- logging and/or reporting requirements;
- quality assurance/quality control processes and metrics;
- storage locations and requirements;

- chain of custody;
- contact information for appropriate support (e.g., legal, security, technical, information management, FOIP, PAA, etc.); and
- digitization processes and procedures.

The DPM is a necessary tool to ensure knowledge transfer, and may be called upon to:

- support litigation by demonstrating what decisions were made and why;
- provide evidence of compliance with standards and/or detail standards exemptions and their rationale;
- authenticate electronic records to ensure legal admissibility; and
- show that the electronic records created during digitization meet or exceed quality assurance and quality control criteria.

Depending on the specifics of the particular digitization project, material for the DPM may come from documentation created for (or in support of) the digitization project (e.g., business need/feasibility analysis, project authorization, contracts, subject matter expert reviews, activity and audit logs, etc.). In the case of large-scale and/or outsourced digitization projects, internal Government of Alberta content may be supported by vendor content.

Phase 3: Preparation of Analogue Records

After a digitization project has been planned and documented in a DPM, analogue records must be evaluated for suitability and prepared for digitization. Considerations when determining an analogue record's suitability for digitization include (but are not limited to):

- the format of the analogue record;
- the physical condition of the analogue record;
    - e.g., is it damaged, is it fragile, etc.
- security and/or privacy concerns;
- the amount of preparation that is anticipated; and
    - e.g., reviewing a box of paper records to ensure that there are no duplicates, repairing magnetic tape reels, etc.
- the redaction of sensitive personal and/or financial information.
    - Redaction can be an expensive and time-consuming process.

Suitability criteria for analogue records and related preservation considerations may be specific to a particular digitization project, and must be documented in the DPM—this will inform the preparation of analogue records for digitization.

After the suitability of the analogue records has been determined, the analogue records must be prepared for digitization. Preparation activities can include (but are not limited to):

- ensuring that lower quality analogue records are clearly marked and recorded (e.g., stamping "poor quality original" on paper records, documenting levels of degradation in a VHS cassette, etc.);
- managing physical defects (e.g., removing staples and paperclips, repositioning self-adhesive notes attached to the document, repairing tears, flattening creases and crumples, etc.);
- re-ordering and/or organizing analogue records (e.g., sorting dated documents in chronological order, removing duplicates, etc.); and
- ensuring that oddly proportioned, fragile, or otherwise irregular analogue records are properly prepared (e.g., taping receipts to a piece of 8.5" x 11" paper, determining preparation required for photographic plates, etc.).

Depending on the digitization project, the processes and procedures used to prepare analogue records for digitization may need to be documented in the DPM—extensive documentation supports the creation of electronic records that can be proven authentic and reliable. If the determination is made that the preparation of analogue records does not need to be documented in the DPM, it is recommended that the DPM capture the risks, potential mitigation strategies, and proper sign offs.

Phase 4: Digitization

The specifics of digitization will vary from digitization project to digitization project, but the process must involve the following:

- the use of analogue records to create electronic records;
    - The digitization must follow the requirements specified in the appropriate DPM and result in the creation of electronic records that support all applicable business, legal and operational requirements.
    - Depending on the condition of the analogue records, the intended use of the electronic records, and other factors, multiple attempts to create electronic records may be necessary (e.g., rescanning a document due to technical malfunction). Depending on the specifics of the digitization project, the logging of multiple digitization attempts may be required—such requirements must be included in the DPM.
- the creation of electronic records that meet the minimum quality assurance requirements as specified by the digitization project's DPM; and
- the application of indexing and metadata to the created electronic records.
    - Proper indexing:
        - Assures future interpretation and trustworthiness of the electronic records, despite changes in technology over time;
        - Ensures that content is appropriately stored and managed, allowing effective and efficient search and retrieval; and
        - Establishes an audit trail in the event of litigation.
    - The Metadata – Core Content Standard describes the foundational set of metadata elements that must be applied to all records within the Government of Alberta.

To ensure the long-term preservation of the electronic records, digitization projects must align with the Digital Records Conversion/Migration Standard.

Quality Assurance and Control

In a digitization project, the principles of quality assurance and quality control apply to both the process and the product; quality assurance involves the measures aimed at preventing defects, while quality control involves the measures aimed at identifying and correcting defects. Quality assurance and control must:

- be conducted at every phase of a digitization project (preparation, digitization, transfer and/or storage) to reduce the risk of the created electronic records lacking authenticity, reliability, integrity, and/or usability;
- apply to both analogue and electronic records to determine if their quality meets minimum requirements and standards established by the business area; and
- be verified by qualified personnel.
    - Qualified personnel are to be determined by the business area.
    - Qualified personnel may include (but are not limited to):

- the manager(s) responsible for a digitization project;
- a technical expert;
- an appointed staff member familiar with a specific digitization project; and/or
- a third-party vendor.

Quality assurance and control minimums, processes, and sign-offs must be captured in the DPM.

Refer to **Appendix 2 – Digitization Quality Assurance and Control** for more information.

Phase 5: Transfer and Storage

Depending on the specifics of the digitization project, the analogue records, the electronic records, and/or the source records may need to be transferred; this situation may arise for a number of reasons, including (but not limited to):

- the digitization project has been outsourced to a third-party vendor;
- analogue records need to be transferred to a separate location for processing;
- source records need to be transferred back to a business area; and/or
- electronic records need to be transferred between systems and/or applications.
    - For more information regarding the requirements for transferring electronic records between systems and/or applications, please refer to the Digital Records Conversion/Migration Standard.
    - As per section 41.4 of the *Alberta Evidence Act*, the integrity of the systems and/or applications in which an electronic record is maintained directly correlates to the integrity of the electronic record itself.

Transfer and storage requirements and processes must be captured in the DPM.

Regardless of how or why analogue records, electronic records and/or source records are transferred, appropriate measures must be taken to ensure that they are secure at all times.

Chain of Custody

In some cases, the chain of custody involved with the digitization project will need to be documented. A chain of custody process is a way of tracking:

- the movement of analogue, source, and/or electronic records;
- when the analogue, source, and/or electronic records are moved; and
- the individuals or groups have had access to the analogue, source, and/or electronic records.

Documenting the chain of custody is vital to ensuring the credibility of both the analogue/source records involved in a digitization project and the electronic records created by a digitization project. Being able to show that the security and integrity of the analogue/source records was maintained before, during, and after digitization helps to prove that the electronic records are credible and authentic.

Chain of custody can be captured in multiple ways (e.g., workflows, email conversations, etc.)—in instances where it is necessary to formally document the chain of custody outside of (or in addition to) an existing process, the chain of custody must be planned, documented, and approved in the DPM prior to project commencement. The chain of custody can be as simple as obtaining direction from the head of a program area approving the use of desktop scanners to

convert receipts into electronic records, or as comprehensive as the extensive logs, audits, and authorizations necessary for archival preservation.

Phase 6: Disposition of Source Records

As per the Records Management Regulation, all records under the control of a department must be scheduled, and records may be disposed of only in accordance with an approved records retention and disposition schedule. The Alberta Records Management Committee Circular 2009-01 – Disposition of Imaged Source Records clarifies that source records must be scheduled as source records, and that existing records retention and disposition schedules "need to be amended to include source records."

NOTE: Source records must be managed, maintained, and disposed of as source records. Source records are not transitory records.

If the business area does not have an approved records retention and disposition schedule that includes an item (or items) for source records, they must contact the appropriate information management professional (i.e., a department's senior records officer or information management director) for guidance.

Source records, like all records, may be responsive to information access (i.e., FOIP) and/or litigation requests. Any source records under information access and/or litigation hold cannot be altered or destroyed until the hold is lifted.

Definitions

NOTE: These definitions are from Canadian General Standards Board (CGSB) 72.34-2017, Electronic Records as Documentary Evidence.

Analogue Record: Record written on physical material, such as paper, parchment, stone, clay, film or certain types of magnetic audio- and videotape.

Digitization: The process of rendering analogue recorded information in electronic (digital) form.

Electronic Record: An analogue or digital record that is carried by an electrical conductor and requires the use of electronic equipment to be intelligible by a person.

Quality Assurance (QA): Procedures for monitoring and assessing the records system, aiming to maintain a desired level of quality.

Source Record: Analogue record from which an electronic (digital) copy is made.

Compliance

Consequences of non-compliance with this guideline could result in the loss of information, damage to Government of Alberta's reputation, exposure of Albertans to harm and/or incurrence of unnecessary costs. Depending on the severity of non-compliance:

- either informal or formal requests and/or follow-ups may be made by Enterprise Information Management, Corporate Internal Audit Services, Corporate Information Security Office, Office of the Information Privacy Commissioner, and/or Public Service Commission, and
- legislated disciplinary action (i.e., *Public Service Act*) may be taken.

References and Supporting Resources

- Alberta Records Management Committee Circular 2009-01 – Disposition of Imaged Source Records
- Data and Information Security Classification Standard
- Digital Records Conversion/Migration Standard
- Digitization Standard
- Metadata Core Content Standard
- Records Management Program Standard

Appendix 1 – Digitization Metadata Elements

This table details optional metadata elements that may be required for digitization, depending on the business area and the nature of the digitization project. This list is by no means complete nor comprehensive—business areas may apply any additional metadata fields they have determined are necessary and/or beneficial.

Digitization Process	**Digitization Indexing Properties**
Capture	• Digitization date and time (Note: time is recommended, but not required) • Number of source records digitized • Digitization equipment operator and device name
Re-capture (If process is required)	• Digitization date and time (Note: time is recommended, but not required) • Number of source records digitized • Digitization equipment operator and device name
Quality Assurance (When QA is done)	• Batch reference (Mandatory for Batch input) • Quality Assurance operator • Quality Assurance check approval date
Transfer	• Transfer date • Transfer title • Transfer description • Transfer reason • Transfer receiving

Appendix 2 – Digitization Quality Assurance and Control

Quality assurance (QA)[1] refers to the processes and procedures for monitoring and assessing a digitization project to systematically reduce and/or eliminate errors. Quality control (QC)[2] refers to the processes and procedures for identifying and addressing defects that have occurred. Both QA and QC are necessary to maintain a desired level of quality for digitization projects.

Errors manifest in a number of ways and have a number of causes; an error is any imperfection or flaw that is present in the electronic record, but is not present in the source record. Minor errors may not affect the readability of the electronic record; however, some errors can result in the loss of content (e.g., a folded page obscuring content, an improperly focused photo making text illegible, etc.).

Errors may include (but are not limited to):

- issues with the digitization process; and/or
    - For example, pages that were missed, documents that were not properly prepared (e.g., pages out order, pages that are upside down, etc.), poor quality (e.g., out of focus, faint, or otherwise illegible).
- issues with the metadata.
    - For example, application of inaccurate metadata, misspelling of metadata elements, metadata not applied.

Poor quality analogue records will result in poor quality electronic records—business areas must ensure that poor quality electronic records are not mistaken for errors (e.g., stamping “Poor Quality Original” on an analogue record before digitization).

Principles to consider when developing QA and QC processes may include (but are not limited to) ensuring that:

- the QA and QC processes are necessary;
    - Electronic records that are processed through a workflow with external review may not require a dedicated digitization QA or QC process (e.g., scanned receipts are verified and validated by Accounts Payable within days of digitization).
- the QA and QC processes are assessed and authorized by the appropriate subject matter experts (e.g., legal, FOIP, digitization project management, etc.);
- QA and QC occur throughout the digitization project, thereby allowing for a quick response to, and resolution of, errors as they occur;
- QC is done as a random sampling (e.g., checking every tenth scan, etc.); and
- the person (or persons) performing QA and QC are not the person (or persons) that performed the digitization.

[1] Please see Definitions section for additional information on this term.

[2] Quality Control is not defined in CAN/CGSB-72.34-2017. The description provided in this section is the result of consultation with internal subject matter experts, and published material on digitization.

Error Threshold

The digitization procedures manual must document the error threshold (i.e., what sort of errors are acceptable, and what errors will result in a source record needing to be digitized again).

Development of an error threshold involves determining the risk associated with the source records. A digitization project must consider:

- the likelihood of human error;
- the probability of litigation, access requests, or any other action that requires accurate and authentic records;
- the scale of the project;
    - It is reasonable to expect that "one-offs" and convenience scanning have an error threshold of 0% (that is, no errors are acceptable); the larger and more complex the digitization project, the higher the likelihood that an error will occur.
- the nature of the analogue records and any risk associated with it; and
    - e.g., analogue records with an applied security classification of Protected B or Protected C can cause significant or grave injury if they are compromised.
- any risks associated with the format and/or condition of the analogue records.
    - e.g., fragile records may require special handling considerations, older documents may have content that is difficult to read due to fading, etc.

While the specifics of digitization projects will vary, the process for developing and implementing an error threshold will not. Business areas must:

- determine how many errors will be allowed;
    - The recommended practice is an accuracy of 98% for the quality of the electronic records (e.g., no more than two page errors when digitizing a 100-page source record) and 98% accuracy for the application of metadata (e.g., no more than 2 errors in metadata application for 100 electronic records).
    - If the likelihood of litigation and/or access requests associated with the records is high, fewer errors are.
- determine the percentage of the total volume of electronic records that will be subject to QC;
    - The recommended practice is 5-10%, but the percentage should be higher if the risk associated with the records is high.
    - For smaller-scale digitization projects (e.g., digitizing a one-page document), it is not unreasonable to require 100% of electronic records are subject to QC.
- ensure that the error threshold and all relevant QA information (e.g., processes, contact information for the people performing QA, etc.) are captured in the project's digitization procedures manual.

Testing QA and QC Processes

Before a digitization project initiates, the digitization, application of metadata, and QA/QC processes must be tested. To test QA and QC processes, business areas must:

- use a representative sample of source records;
    - The sample should include all types, sizes, and conditions of source records that will be digitized.
        - Ensure boundary conditions are represented, such as the faintest, the most color saturated, etc.
- produce a test run within the error threshold;

    - e.g., if the error threshold is 0%, then the test run should have no digitization errors and no metadata application errors.
- identify the origin and mitigation strategy if the error threshold is consistently exceeded during the test run; and
    - The origin of errors should be investigated, documented, reported and captured in the digitization procedures manual.
- repeat testing until electronic records are consistently produced within the error threshold.

Regardless of testing, unexpected errors may occur. Business areas must ensure that the parties responsible for QA and QC recognize what constitutes acceptable errors and what errors require escalation.