

**Simon
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**Archives and
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Department**

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eRecords Research Report 2

Functions, Activities, Resource Requirements

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1. Introduction

The purpose of this report is to identify some of the requirements for an electronic records preservation program at Simon Fraser University. It analyzes the management of archival electronic records into a number of core functions and enumerates the resources required to support each.

The report was created as an outcome of the TeleLearning e-records preservation and access project. During the course of that project, it became apparent that much of the information compiled as background research had relevance beyond the TeleLearning records. The main concern was that this information be captured in a format that would make it available for subsequent use. Hence this report is conceived as a preliminary roadmap, a work in progress that should be updated as the department's thinking on these issues evolves.

Section 2 of this report breaks down the process of preserving and providing access to authentic electronic archives into nine core functions and analyzes each. Functions do not follow each other in a purely sequential order; section 3 provides a model of the workflow, presenting the various activities as they occur in the overall process.

Please note that the numbering system used in §2 links this document to several other reports. *eRecords Research Report 3: Models, Strategies, Options* contains detailed discussions of the various models enumerated in §2 and uses the same numbering scheme so that the two documents are cross-referenced. The nine functions identified in §2 also provide the structure for developing and documenting preservation and access strategies for each fonds containing e-records; the *TeleLearning eRecords Preservation and Access Strategy* will be the first such report.

2. Functions

Nine core functions are involved in the preservation of and provision of access to authentic, archival e-records:

1. Identify electronic records.
2. Appraise electronic records.
3. Acquire electronic records.
4. Dispose of non-archival electronic records.
5. Arrange and describe archival electronic records.
6. Process archival electronic records.
7. Store archival electronic records.
8. Preserve archival electronic records.
9. Provide access to archival electronic records.

This section analyzes each of these functions in terms of the following elements:

- Purpose and scope of the function.
- The activities that make up the function.
- Models and strategies currently proposed or pursued by other institutions.
- Inputs and outputs.
- Resources required to support the activities, including policy-related tools (policies, procedures, guidelines, standards, forms), equipment (hardware, software, media), and institutional support (financial, technical or other).
- Other notes.

Note that this is a presentation of activities grouped by function and **not** by their order in time. The functions do not necessarily follow a sequential order. For example, appraisal (function 2) precedes acquisition (function 3) as appraisal for acquisition; as appraisal for selection, however, it may follow acquisition. Similarly, storage activities (function 7) will appear at various stages in the process. For workflow, see §3 below.

2.1 Identify electronic records

Purpose Discover recordkeeping systems generating e-records to ensure that e-records are appraised and those having archival value acquired.

Scope University record-creating bodies; private organizations with whom the Archives has entered into an Agreement to Transfer; private individuals whose papers the Archives would like to acquire.

Activities

- 1.1 Interview creators.
- 1.2 Organize self-assessment by creators.
- 1.3 Inventory electronic recordkeeping systems.
- 1.4 Support the effective management of active e-records.

Models and strategies How:

- 1.A.1 Ad hoc discovery.
- 1.A.2 Self-assessment by creators.
- 1.A.3 Inventory by Archives.
- 1.A.4 Integrate with departmental projects offering other recordkeeping services.

What:

- 1.B.1 Enterprise database applications.
- 1.B.2 Departmental database applications.
- 1.B.3 Departmental shared directories.
- 1.B.4 Personal work-spaces on shared departmental directories.
- 1.B.5 Individual desktops.
- 1.B.6 Enterprise backup systems.
- 1.B.7 Departmental backup systems.
- 1.B.8 Individual backup systems.
- 1.B.9 Department websites.
- 1.B.10 Department offline storage devices.

Inputs Information about creator's recordkeeping systems and practices.

Outputs Descriptions of electronic recordkeeping systems and e-records.

Resources required Policy tools:
Standard interview questions (1.1).
Survey forms (1.2).
Inventory forms (1.3).
File format registry (1.3).
Email policy (1.4).
Directory management tools (1.4).
Meta-data standards and templates (1.4).
Advice sheets for private donors (1.4).

Equipment:

Database to store information about:

- Descriptions of electronic recordkeeping systems and their records (1.2, 1.3, 1.4).
- File formats and technical requirements (1.2, 1.3, 1.4).

Support:

Departmental and donor cooperation.
University IT staff expertise.

Notes Support for the management of university active and semi-active e-records is subsumed here under activity 1.4. In fact this is really a separate program area (records management) and could be analyzed in a similar way (i.e. breakdown into core activities, sub-activities, resources required).

2.2 Appraise electronic records

Purpose Assess the characteristics and values of e-records to ensure identification of those having sufficient continuing value to warrant archival preservation.

Scope Electronic recordkeeping systems; record series containing electronic records; individual records within recordkeeping systems or series.

Activities

- 2.1 Research records' context (juridical-administrative, provenancial, procedural, documentary, technological contexts).
- 2.2 Establish active and semi-active retention requirements.
- 2.3 Assess records' authenticity.
- 2.4 Assess feasibility of preservation.
- 2.5 Assess records' archival value.
- 2.6 Make appraisal decision.
- 2.7 Monitor appraisal decision.

Models and strategies

When:

- 2.A.1 Appraise at moment of creation (system design).
- 2.A.2 Appraise when records are active.
- 2.A.3 Appraise when records are semi-active.
- 2.A.4 Appraise when records are inactive.
- 2.A.5 Appraise when system is obsolete.

What:

- 2.B.1 Archival value.
- 2.B.2 Authenticity.
- 2.B.3 Feasibility of preservation.

Who:

- 2.C.1 Creators.
- 2.C.2 IT staff.
- 2.C.3 Archives.

Inputs Descriptions of electronic recordkeeping systems and e-records (1).
Technical requirements associated with preservation of different file formats (8).

Outputs RRSDAs.
Appraisal decisions.
Selection criteria.

Resources required Policy tools:
Description templates for e-systems (2.1).
RRSDAs (2.2).
Benchmark requirements for authenticity (2.3).
Preservation feasibility checklist (2.4).
Archival appraisal benchmarks (2.5).
Appraisal report (2.6).
Monitoring schedule (2.7).

Equipment:

Database to store information about:

- Description of electronic recordkeeping systems (2.1).
- Retention schedules and records management appraisals (2.2).
- Assessments of authenticity (2.3).
- Assessments of feasibility of preservation (2.4).
- Appraisals of archival value (2.5).
- Appraisal decisions (2.6).

Support:

Departmental and donor cooperation for information-gathering.

Access to creator's systems documentation.

Technical advice for determining feasibility of preservation.

Departmental and donor cooperation for assigning roles and responsibilities for monitoring appraisal decisions.

Notes Appraisal occurs at various times in the workflow: after identification (appraisal for acquisition), after acquisition (appraisal for selection), during processing (implementing selection). Appraisal decisions should be regularly monitored to ensure that the information on which the original decision was made is still valid.

2.3 Acquire electronic records

Purpose Take physical and legal custody of archival e-records to ensure their long-term archival preservation.

Scope All e-records transferred by university departments or private donors to the Archives for archival preservation.

Activities

- 3.1 Identify and list e-records due for transfer (creator).
- 3.2 Compile metadata associated with e-records due for transfer (creator).
- 3.3 Collect documentation associated with e-records due for transfer (creator).
- 3.4 Transfer e-records, metadata, and documentation to Archives (creator).
- 3.5 Confirm (communicate to creator) receipt of material transferred.
- 3.6 Quarantine e-records transferred, check for viruses.
- 3.7 Audit integrity of e-records transferred.
- 3.8 Accession transferred material.
- 3.9 Move e-records to "pending processing" e-storage area if not scheduled for immediate processing.
- 3.10 Confirm (communicate to creator) completion of transfer.

Models and strategies How:

- 3.A.1 Transfer original storage device (server hardware, software and records).
- 3.A.2 Transfer over a network connection.
- 3.A.3 Transfer on removable storage device (CD, DVD).

What:

- 3.B.1 Take records in "as is" format.
- 3.B.2 Require creator to convert to transfer format.
- 3.B.3 Require creator to compile associated metadata.
- 3.B.4 Require creator to collect associated systems documentation.

Inputs E-records.
Metadata.
Systems documentation.
Description information captured during identification (1) and appraisal (2).

Outputs Completed transfer forms.
Confirmation forms.
Accession records.

Resources required Policy tools:
Transfer protocol and procedures for university bodies and private donors (3).
Notice of records due for transfer (3.1).
Transfer forms (records, metadata, documentation) (3.1, 3.2, 3.3).
Confirmation of receipt of transfer form (3.4).
Audit standards (3.7).
Accession record form (3.8).
Confirmation of completion of transfer form (3.10).

Equipment:

Stand-alone computer dedicated to quarantining transfers (3.6).
Virus-checking software.
Digital camera to photograph removable storage devices if relevant (3.7).
Software to capture screen shot of creator's original file directory (3.7).
Database to store information about:

- Accessions (3.9).
- Metadata (3.9).
- Creator documentation (3.9).
- Locations of "pending processing" e-records (3.10).

Support:

Departmental training in transfer procedures.

Notes Acquisition activities are typically sandwiched between two appraisal processes: appraisal for acquisition > transfer / acquisition > appraisal for selection.

2.4 Dispose of non-archival electronic records

Purpose Destroy inactive e-records which are not selected for archival preservation and ensure that records containing personal or confidential information are disposed by confidential destruction.

Scope Records held by university departments which are scheduled for destruction; university or private records transferred to Archives but not selected for permanent retention.

Activities 4.1 Identify non-archival e-records due for destruction.
4.2 Prepare e-records for destruction.
4.3 Implement destruction.
4.4 Document e-records destroyed.

Models and strategies How:
4.A.1 Standard delete.
4.A.2 Secure delete.
4.A.3 Physical destruction of removable storage media.

Who:
4.B.1 Creating department.
4.B.2 Archives.
4.B.3 Other university departments.
4.B.4 External contractors.

Inputs E-records designated for destruction.

Outputs Destruction reports.

Resources required Policy tools:
Destruction procedures and protocol for university departments (4).
Notice of e-records due for destruction (4.1).
Destruction list template (4.1).
Destruction report form (4.4).

Equipment:
Software for secure deletion (e-shredding) (4.3).
Machinery for physical destruction of storage media (4.3).

Database to store information about destructions (4.4).

Support:

Department training in destruction procedures.

Facilities Management for physical destruction of storage devices.

Notes Confidential destruction should be applied to *all* e-records not selected for archival preservation, not just those containing personal or confidential information. This avoids the time-consuming process of segregating records requiring confidential destruction from those that can be destroyed less securely.

2.5 Arrange and describe archival electronic records

Purpose Integrate e-records into the arrangement of the creator's fonds and produce RAD-compliant descriptions to ensure intellectual control.

Scope All e-records selected for archival preservation.

Activities 5.1 Determine arrangement of e-records.
5.2 Assign reference codes to e-records.
5.3 Describe e-records at appropriate levels of arrangement.

Models and strategies Arrangement:
5.A.1 Multimedia: integrate related records irrespective of media.

Description:
5.B.1 Register as files.
5.B.2 Register as items.

Inputs Descriptive information compiled during identification (1), appraisal (2), and preservation (8).
E-records selected during processing (6).

Outputs RAD-compliant descriptions of e-records.
File and item lists in finding aids that include e-records.

Resources required Policy tools:
Arrangement and description policy (5).
Rules for Archival Description (5.3).

Equipment:
Database to store descriptive information (5.2, 5.3).

Notes In the workflow this function and the processing function (6) occur together. Both involve the integration of the e-records into the fonds, here (arrangement and description) intellectually, there (processing) physically.

Description draws on metadata compiled for preservation purposes; however,

for some of that metadata there may be no RAD field equivalent and the two types of information should be maintained separately.

2.6 Process archival electronic records

Purpose Integrate e-records into Archives' physical control and preservation systems to ensure their physical control.

Scope All e-records selected for acquisition.

Activities

- 6.1 Register metadata.
- 6.2 Implement appraisal for selection decisions.
- 6.3 Assign unique IDs to e-records.
- 6.4 Rename e-records according to naming conventions.
- 6.5 Determine conversion formats.
- 6.6 Convert e-records to preservation format.
- 6.7 Audit conversion.
- 6.8 Implement storage decisions.
- 6.8 Document actions taken on e-records.

Models and strategies

Metadata:

- 6.A.1 Collect from creator.
- 6.A.2 Compile manually during processing.
- 6.A.3 Automate compilation.

IDs:

- 6.B.1 Do not assign IDs.
- 6.B.2 Assign IDs at e-folder level.
- 6.B.3 Assign IDs at e-item level (computer file).

Inputs

- Selection criteria (2).
- E-records and metadata acquired (3).
- Storage decisions re: locations, media (7).
- Preservation decisions re: formats (8).
- Access decisions re: formats (9).

Outputs

- Archival e-records in original format.
- Archival e-records in preservation format.
- Archival e-records in access format.
- Processed metadata associated with e-records.

Resources required Policy tools:
Metadata standards (6.1).
E-record ID and naming standards (6.3, 6.4).
File format standards (actions appropriate for each file format) (6.5, 6.6).
Audit standards (6.7).
Documentation standards (6.8).

Equipment:

Software to automate compilation of metadata (6.1).
Software to automate renaming of e-items (6.2, 6.3).
Software to automate conversion of e-records to preservation formats (6.5).
Database to store information about:

- Metadata (6.1).
- File formats and technical requirements (6.3, 6.4, 6.5).
- Actions undertaken on e-records (6.8).

Support:

Software vendors.
University IT expertise.

Notes In the workflow this function and arrangement and description (5) occur together. Both involve the integration of the e-records into the fonds, here (processing) physically, there (arrangement and description) intellectually.

Processing implements a number of decisions made elsewhere as inputs: selection criteria (2), preservation and access formats (8, 9), storage media and locations (7).

2.7 Store electronic records

Purpose Move e-records to a physical storage medium to ensure their longevity, integrity, and accessibility.

Scope Quarantined e-record acquisitions; pending processing e-records; processed archival e-records.

Activities

- 7.1 Identify e-records for storage.
- 7.2 Identify e-storage location area.
- 7.3 Register storage medium (e.g. date purchased, batch, capacity etc).
- 7.4 Make temporary backup of e-records before copy.
- 7.5 Copy e-records onto storage medium.
- 7.6 Audit copy.
- 7.7 Register e-records' storage location.
- 7.8 Dispose of temporary backup copy.

Models and strategies

On-line:

- 7.A.1 Regular hard-disk functioning as server.
- 7.A.2 Special server hardware.

Near-line:

- 7.B.1 CD jukebox.
- 7.B.2 Magnetic tape library.

Off-line:

- 7.C.1 Floppy disk.
- 7.C.2 Zip-disk.
- 7.C.3 CD disk.
- 7.C.4 DVD disk.
- 7.C.5 Magnetic tape.
- 7.C.6 Dedicated hard-disk.

Responsibility:

- 7.D.1 Archives maintains (in-house)
- 7.D.2 University maintains (OTS).
- 7.D.3 External service-provider maintains (contract).

Storage areas:

- 7.E.1 Quarantine space.
- 7.E.2 Temporary backup space.
- 7.E.3 Security backup space.

- 7.E.4 Pending processing space.
- 7.E.5 Processed originals space.
- 7.E.6 Processed preservation copies space.
- 7.E.7 Processed access copies space.

Inputs E-records sent to Archives for appraisal and quarantined (2).
E-records acquired and quarantined (3).
E-records during processing.
Processed e-records (original, preservation, access and backup copies / formats).

Outputs E-records stored to a medium.

Resources required Policy tools:
Storage procedures, roles and responsibilities, standards (8).
Storage media metadata requirements (7.1).
Audit standards (7.4).

Equipment:
Storage devices (hardware) (7.5).
Database to store information about:

- E-storage locations (7.7).
- E-storage media (7.3).

Support:
University IT departments with role in storage.

Notes The storage function may come into play at various stages in the workflow: identification (1), appraisal (2), acquisition (3), processing (6), provision of access (9).

2.8 Preserve archival electronic records

Purpose Manage actions on e-records over time to ensure their longevity, integrity, and continuing accessibility.

Scope All accessioned e-records.

Activities

- 8.1 Audit storage devices (check media deterioration).
- 8.2 Audit file formats (check software obsolescence).
- 8.3 Identify e-records at risk because of media deterioration or format obsolescence.
- 8.4 Copy at risk e-records to new medium and / or migrate to new format.
- 8.5 Document all actions taken on e-records.

Models and strategies

Format:

- 8.A.1 Retain in original format.
- 8.A.2 Migrate to latest version of original software.
- 8.A.3 Migrate to a preservation format.
- 8.A.4 Rely on emulation software.

Copies:

- 8.B.1 Original format.
- 8.B.2 Preservation copy.
- 8.B.3 Access copies.
- 8.B.4 Backup copies.

Audit:

- 8.C.1 Do not audit.
- 8.C.2 Integrate audit with processing of accruals.
- 8.C.3 Integrate audit with retrieval requests.
- 8.C.4 Set audit schedules.

Inputs Pending processing e-records.
Processed e-records.

Outputs Audit reports.
E-records migrated / refreshed.
Preservation log updated.

Resources required Policy tools:
Preservation policy (8).
Preservation strategy template (complete one for each fonds containing e-records) (8).
Media and e-record audit schedules (8.1).
Media deterioration checklists (8.1).
File format technical requirements (8.2).
Acceptable deterioration rate standards (8.3).
Preservation log (8.5).

Equipment:

Database for storing information about:

- Preservation strategies (8)
- Media refresh triggers (8.4).
- File format migration triggers (8.4).
- Preservations actions undertaken (8.5).

Support:

Technical advice and expertise.

Notes Considerations of the preservation requirements come into play in appraisal (2.4), processing (6.4, 6.5), and storing records (7.5).

2.9 Administer access to archival electronic records

Purpose Provide researchers with access to e-records, while ensuring compliance with access, privacy, and copyright statutory and policy requirements.

Scope All processed archival e-records.

Activities

- 9.1 Receive access request.
- 9.2 Determine access status.
- 9.3 Review e-records (if required).
- 9.4 Update access status in AIS.
- 9.5 Negotiate research agreement or process formal FOI request (if required).
- 9.6 Prepare records for access (e.g. access copies, digital watermarks).
- 9.7 Provide access to e-records.

Models and strategies What:

- 9.A.1 Originals.
- 9.A.2 Preservation copy.
- 9.A.3 Access copy.

How:

- 9.B.1 On-line access over a network.
- 9.B.2 Dedicated reading room terminals.
- 9.B.3 Email.
- 9.B.4 Download.
- 9.B.5 CD.

Status of records:

- 9.C.1 Open records.
- 9.C.2 Restricted records.
- 9.C.3 Records pending review.

Inputs Finding aids (5).
Retrieval request forms.
Processed archival e-records (6) stored in access format (8).

Outputs Delivery of access to e-records.

Resources Policy tools:

required Access policy (9).
Researcher retrieval request form (9.1).
Access and restrictions standards (9.3).
Research agreement template (9.5).
E-records access protocol (9.7).

Equipment:

User interface for online access (10.1, 10.6).
Software to create digital watermarks on access copies (10.6).

Database to store information about:

- Access requests (10.1).
- Access status (10.2).
- Research agreements and formal FOI requests (10.5).
- Delivery of e-records (10.7).

Support:

Technical advice and expertise.

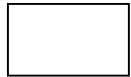
Notes Decisions on the access protocol for e-records will affect the user interface through which users make access requests (9.1) and receive access (10.7).

The preparation of records for access (9.6) may in fact be completed during processing (6).

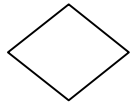
3. Workflow

Section 2 presents a functional analysis of the various activities and resources required for the management of archival e-records. This section provides a model for the workflow, showing how the various activities of the different functions follow one another in time.

The following diagrams uses a number of diagramming conventions. These are:



Process (corresponds to one of the nine core functions).



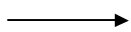
Decision.



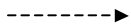
Storage (used for e-records; does not make any assumption about the storage medium – online, offline, or nearline).



Document(s) produced as output.

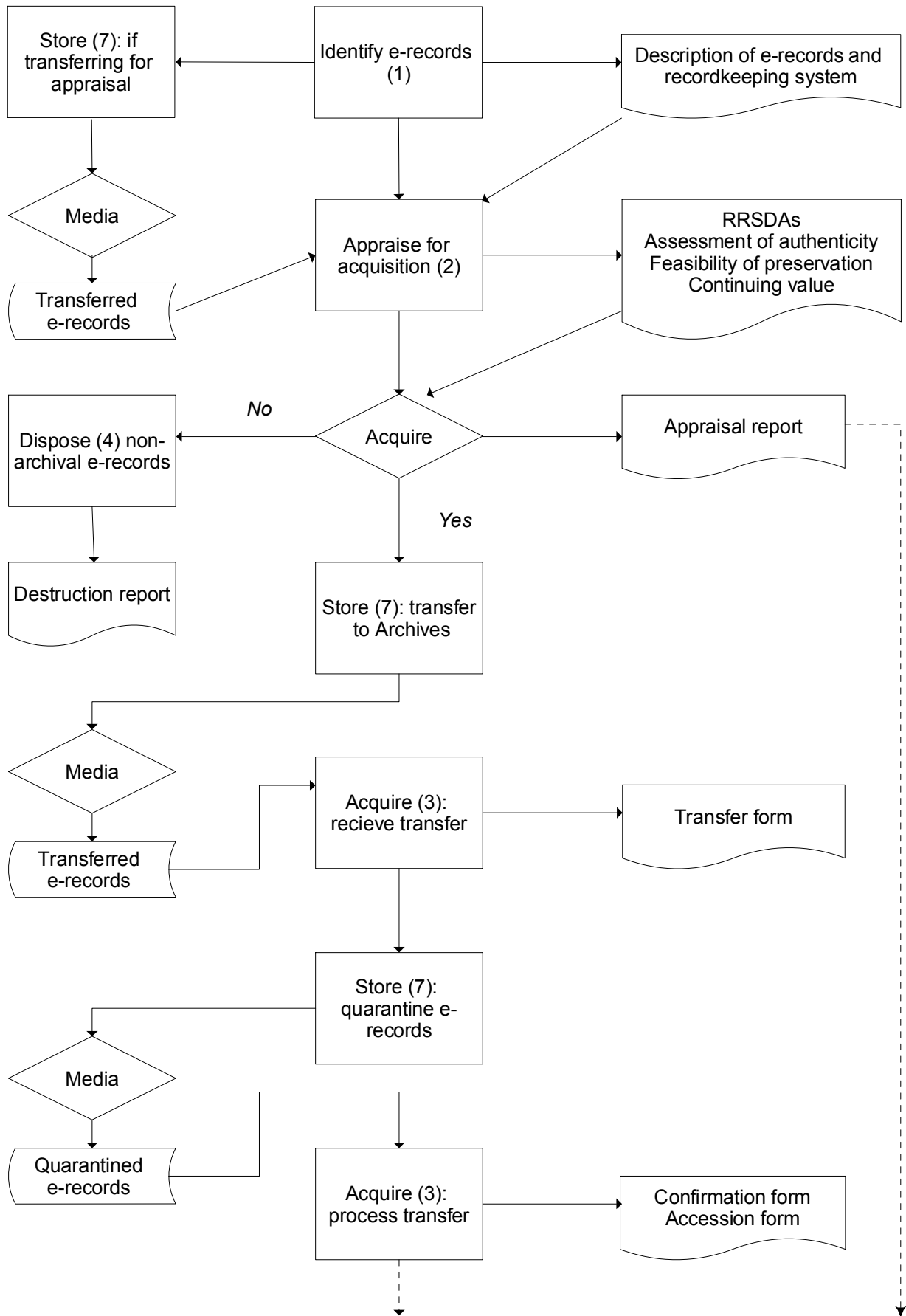


Direction of flow.



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Workflow diagram (1 of 2)



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Draft (0.1)	Nov 29, 2004	Richard Dancy	Discussed with Ian.
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