AGENCIES

ELECTRONIC RECORDS MANAGEMENT
AND
ARCHIVES MANAGEMENT POLICY

Electronic Records and the National Archives Act 2003

NATIONAL ARCHIVE OF MALAYSIA

ARKIB NEGARA MALAYSIA

Projek Pemeliharaan Rekod Elektronik Sektor Awam (e-SPARK)

Project Documentation

Electronic Records and the National Archives Act 2003

Electronic Records and the National Archives Act 2003

Preface

This publication was produced as a result of the e-Spark initiative. Sponsored by the National Archives and involving departments and agencies from across the Government of Malaysia, the purpose of the e-Spark initiative was to develop policies, standards and practices, technical specifications and training plans to enable the Government of Malaysia to manage records in electronic form. Also included was a strategic plan reflecting the roles and responsibilities of public offices and various central and lead agencies. The Arkib Negara Malaysia, within its legislative mandate to facilitate the management of records in any physical form and to acquire, preserve and make available those of archival value, is the lead department responsible for facilitating the government-wide management of electronic records. In this capacity and in cooperation with other central agencies and public offices it is responsible for issuing standards and guides to government departments on the management of electronic records.

Public offices are required to comply with the provisions of the National Archives Act 2003. The standards and procedures set out in this document are designed to support public offices in meeting their obligations under the Act. Emphasis is given to the requirement by public offices not to dispose of their records without the approval of the National Archivist and to transfer records assessed as having archival value to the control of the Arkib Negara Malaysia.

This document should be used in conjunction with the *Guidelines on Electronic Records Management* which was produced by the Arkib Negara Malaysia to help public offices manage electronic records. More specific guidelines addressing the management of electronic records in specific environments are also available. These are as follows: *Managing Electronic Records in the Unstructured Environment, Managing Electronic Records in the Structured Environment;* and *Managing Electronic Records in the Web Environment.* All are available from the Arkib Negara Malaysia.

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Electronic Records and the National Archives Act 2003

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Electronic Records and the National Archives Act 2003

1. Introduction

The *National Archives Act* was proclaimed in 2003. Among its provisions are those which set out the obligations of the National Archives and public offices for the management of public records including those that are recorded in electronic form.

The guidelines and procedures described in this document are designed to enable public offices to comply with the *National Archives Act 2003* and those legislative provisions requiring public offices not to dispose of their records (including electronic records) without the approval of the National Archivist and to transfer records assessed as having archival value to the control of the Arkib Negara Malaysia.

This document should be used in conjunction with the *Guidelines on Electronic Records Management* which was produced by the Arkib Negara Malaysia to help public offices manage electronic records. More specific guidelines addressing the management of electronic records in specific environments are also available. These are as follows: *Managing Electronic Records in the Unstructured Environment, Managing Electronic Records in the Structured Environment;* and *Managing Electronic Records in the Web Environment.* All are available from the Arkib Negara Malaysia.

2.   Concepts and definitions

2.1   Introduction

This Section describes some of the basic concepts associated with recordkeeping and the management of electronic records. It is a foundation section upon which the guidelines and procedures provided in subsequent sections can be understood more clearly.

According to the *National Archives Act 2003* and in line with the *Policy on Electronic Records Management and Archives Management*,

> *"records"* *means materials in written or other form setting out facts or events or otherwise recording information and includes papers, documents, registers, printed materials, books, maps, plans, drawings, photographs, microfilms, cinematograph films, sounds recordings, electronically produced records regardless of physical form or characteristics and any copy thereof;*

> *"public records"* *means records officially received or produced by any public office for the conduct of its affairs or by any public officer or employee of a public office in the course of his official duties and includes the records of any Government enterprise and also includes all records which, on the coming into operation of this Act, are in the custody or under the control of the National Archives of Malaysia established under the National Archives Act 1966 [Act 511];*

Electronic public records are those records that fulfill these criteria and which are created and maintained in electronic format.

2.2   Purpose of a Public Record[1]

The purpose of a public record, including an electronic public record, is to serve as an authoritative, authentic, and reliable source of information and as the means of documenting decisions. Most importantly it would serve as evidence to the transactions that transpired in government.

Adequate public records enable organizations to:

- Conduct business in an orderly, efficient and accountable manner.

- Help deliver services in a consistent and equitable manner.

- Support and document policy formation and managerial decision-making.

- Provide consistency, continuity and productivity in management and administration.

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[1] Derived from ISO Standard 15489, *Information and Documentation – Records Management*, 2001

- Facilitate the effective performance of activities through an organisation.

- Promote transparency, openness, accountability and related attributes that demonstrate the concept of 'good government'.

- Provide continuity in the event of a disaster.

- Meet legislative and regulatory requirements including archival, audit and oversight activities.

- Provide protection and support in litigation including the management of risks associated with the existence of or lack of evidence of organizational activity.

- Protect the interests of the organization and the rights of employees, clients and present and future stakeholders.

- Support and document current and future research and development activities, developments and achievements, as well as historical research.

- Provide evidence of business, personal, and cultural activity.

- Establish business, personal and cultural identity.

- Function as corporate, personal or collective memory.

Public records are an integral part of business processes and must be managed and retained for as long as they are needed to support the functions of the government and to provide evidence of decisions and activities (see Figure 2.1).
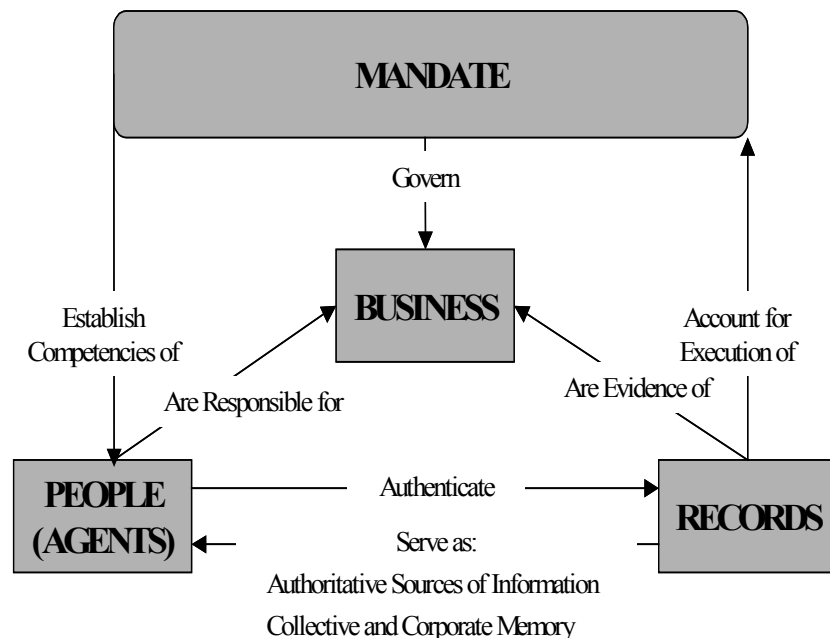
Figure 2.1: Records as an Integral Part of the Business Activity

To support the continuing conduct of business, satisfy applicable legal requirements, and provide necessary accountability, public offices must create and maintain authentic, reliable and usable records, and protect the integrity of those records for as long as they are required to exist. To do this, public offices should institute and carry out a comprehensive records management program, which includes[2]:

a) Determining what records should be created, what information needs to be included in the records, and what level of accuracy is required.

b) Deciding in what form and structure records should be created and captured.

c) Determining requirements for retrieving and using records and how long they need to be kept to satisfy those requirements.

d) Deciding how to organize records so as to support requirements for use.

e) Ensuring that records are created and maintained in accordance with these requirements.

f) Preserving the records and making them accessible over time, in order to meet business and societal requirements.

g) Complying with legal and regulatory requirements, applicable standards and organizational policy.

h) Ensuring that records are retained for as long as required.

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[2] Derived from ISO Standard 15489, *Information and Documentation – Records Management*, 2001

2.3   Attributes of a Public Record[3]

In order to serve as reliable evidence of decisions and activities, public records must have the following qualities:

Authenticity

An authentic public record is one that is proven both to be what it purports to be and to have been created or sent by the person who purports to have created or sent it. To demonstrate the authenticity of public records, organizations should implement and document policies and procedures which control the creation, transmission and maintenance of public records to ensure that records creators are authorized and identified and that public records are protected against unauthorized addition, deletion and alteration. To be authoritative, a public record should be created at the time of the transaction or incident to which it relates, or soon afterwards, by individuals who have direct knowledge of the facts or by instruments routinely used within the business to conduct the transaction.

Reliability

A reliable public record is one whose contents can be trusted as a full and accurate representation of the transactions, activities or facts to which they attest and can be depended upon in the course of subsequent transactions or activities.

Integrity

The integrity of a public record refers to its being complete and unaltered. It is necessary that a record be protected against alteration. Records management policies and procedures should specify what additions or annotations may be made to a public record after it is created, under what circumstances additions or annotations may be authorized, and who is authorized to make them. Any authorized annotation or addition to a public record made after it is complete should be explicitly indicated as annotations or additions.

Usability

A useable public record is one which can be located, retrieved, presented and interpreted. It should be capable of subsequent presentation as directly connected to the business activity or transaction which produced it. The contextual linkages of public records should carry the information needed for an understanding of the transactions that created and used them. It should be possible to identify a public record within the context of broader business activities and functions. The links between public records which document a sequence of activities should be maintained.

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[3] Derived from ISO Standard 15489, *Information and Documentation – Records Management*, 2001

Accuracy, Adequacy and Completeness

A public record should correctly reflect what was communicated, decided or done. It should be able to support the needs of the business to which it relates or it evidences so that it can be used for accountability purposes. A public record should contain not only the content, but also the metadata necessary to document a transaction, as follows:

- The structure of a public record, that is, its physical and logical format and the relationships between the data elements comprising the record, should remain physically or logically intact

- The context in which the public record was created, received and used within business should be apparent in the record (including the business process of which the transaction is part, and the participants in the transaction)

- The links between documents, held separately but combining to make up a public record, should be present.

2.4   Principles for Electronic Records Management

The following principles govern the management of electronic records:

- Electronic records are assets that need to be managed with the same diligence as any other asset.

- The management of electronic records is not a problem that needs to be solved. Its effective implementation in support of programme/ service delivery, decision-making, etc., should be viewed from the perspective of the extent to which it can lead to cost savings, cost avoidance, risk reduction, and opportunity gain.

- An electronic records management infrastructure is function driven. The requirements of a Government programme or strategic direction drive the decisions about what records need to be created, collected, acquired, etc. and how electronic records should be used, preserved, and systematically disposed.

- While the introduction of computer technologies will change the nature of the records and may even conceivably lead to the de facto record of Government functions becoming electronic, the management principles remain the same.

- The nature of the work of electronic records management and its associated competencies define the electronic records management community. While registry personnel are central to the community, other communities such as information technology, audit, the officials responsible for the delivery of Government programs and services, and those involved in the private sector in providing records management technologies and services are also involved and must be considered when developing awareness and education/ training programs.

- The management of electronic records is the responsibility of all individuals.

2.5 Conditions for Electronic Records Management[4]

The requirements for record keeping that are described in the following section represent a set of conditions that must be met if electronic records are to be authentic and reliable and to serve the purposes for which they were created and retained. They are in the form of a checklist that can be used by program managers and staff, applications systems developers, registry staff, LAN administrators, web masters and others to assess the extent to which these conditions are being met for the capture, maintenance, and preservation of electronic records.

Records are captured

Records have been created by all business transactions.

- Communications in the conduct of business between two people, between a person and a store of information available to others, and between a source of information and a person, generate a record.
- Data interchanged within and between computers under the control of software employed in the conduct of business created a record

Records are identifiable. They are related to a transaction which used all the data in the record and only that data.

- There exists a discrete record, representing the sum of all communications associated with a business transaction.
- All data in the record belongs to the same transaction.
- Each record is uniquely identified.

Records are complete. They contain the content, structure and context generated by the transaction they document.

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[4] The following conditions were adapted from the "Pittsburgh requirements" developed as a result of the project, *Business Acceptable Communications* (also known as the Pittsburgh Project), University of Pittsburgh, 1989-1993.

Records are accurate. The content of records is quality controlled at input to ensure that information in the system correctly reflects what was communicated in the transaction.

Records are understandable. The relationship between elements of information content is represented in a way that supports their intended meaning.

Records are meaningful. The contextual linkages of records are in place to carry information necessary to correctly understand the transactions that created and used them.

- The business rules for transactions, which minimally locate the transaction within a business function, are maintained.
- A representation of the source and time of the transaction which generated a record is maintained.
- Links between records which comprised a business activity are retained.

Records are authentic.

- All records have creators which are documented.
- Authorized records creators originated all records
- Records creators have been authorized to engage in the business transaction that generated the records.

Records are maintained

Records are preserved. The records continue to reflect content, structure and context within any systems by which the record are retained over time.

Records are inviolate. Records are protected from accidental or intended damage or destruction and from any modification.

- Data within a record are not deleted, altered or lost once the transaction which generated it has occurred.

Records are coherent. The information content and structure of records is retained in re-constructible relations.

- If records are migrated to new software environments, content, structure and context information are linked to software functionality that preserves their executable connections or representations of their relations thus enabling humans to reconstruct the relations that pertained in the original software environment.
- Logical record boundaries are preserved regardless of physical representations.

Records are auditable. The context of the records represents all processes in which the records participated.

- All uses of records are transactions.
- Transactions which index, classify, schedule, file, view, copy, distribute, or move a record without altering it are documented by audit trails attached to the original record.
- Transactions which execute a records disposition instruction whether for retention or destruction are documented by audit trails attached to the original record.

Records are removable. The record's content and the structure supporting the meaning of the content may be deleted by authorized individuals (i.e. in accordance with approved retention and disposal schedules).

- Authority for deletion of record content and structure exists.
- Deletion transactions are documented as audit trails.
- Deletion transactions remove the content and structural information of records without removing audit trails reflecting context.

Records are usable

Records are exportable. Records may be transmitted to other systems without loss of information.

- The export import facility has facilities to determine the elements of records metadata, the record content, the associated history data, etc and the sequence that is exported and then imported.
- Exporting protocols are reversible or the lost functionality is represented in a fashion that produces the same result in the target system as in the originating environment.

Records are accessible. It is possible to output record content, structure and context.

Records are available. It is possible to retrieve records.

Records are renderable. Records are displayed, printed or abstractly represented as they originally appeared at the time of creation and initial receipt.

- The structure of data in a record appears to subsequent users as it appeared to the recipient of the record in the original transaction or a human meaningful representation of that original rendering accompanies the presentation of the original content.

Records are evidential.

- Records reflect the context of their creation and use.

- Human meaningful representation of the contextual audit trail of a record accompanies all displays or printed output.

Records are redactable? Records are masked when it is necessary to deliver censored copies and the version as released is documented in a linked transaction.

- The release of redacted versions of a record is a discrete business transaction.
- The fact of the release of a redacted version of a record is an auditable use of the original record and therefore results in creation of an audit trail with a link to the transaction which released the redaction.

These conditions must be met if the records required in support of the business and accountability requirements of a bureau or department are to be captured, used, and maintained as authentic and reliable records through time.

2.6 Under the Control of…

Records generated, collected or received in carrying out the activities of a public office, including those stored in the computer directories of individuals, regardless of whether they are located in their offices or their homes, are considered to be under the control of the public office responsible for the activities (i.e. the public office owns or controls the information). Should a formal request for records be made (e.g. pursuant to a legal proceeding), then the public office controlling the records would be required to ensure that all records pertaining to the issue, including the electronic documents stored in individual user directories (either at the office or at home), would be 'frozen' (i.e. not deleted) pending the outcome of the review.

While the public office is accountable for decisions regarding when and if records are under the control of the public office, the National Archives is accountable for providing interpretative advice to facilitate the decision-making process.

2.7 Categories of Records

For the purposes of records retention and disposition, there are four broad categories of government records (see figure 2.2):

- Records common to the internal administration of institutions (i.e. functional records). A large proportion of functional records are of short-term business value (also known as short term corporate memory)

- Records unique to the specific operational responsibilities of an institution; there are two sub-categories of records - those that are generated as a result of the delivery of programs and services (often in the form of case files generated in the highly structured application systems environment) and those that pertain to the policies, decisions, and processes that govern the delivery of programs and services (often generated in the unstructured

environment). Relative to functional records, a significant proportion of these records (especially those in the latter category) are of long-term business value (i.e. they contribute to long-term corporate memory).

- Records of transitory value found in the categories of records described above. Such records need to be retained for only a very short period of time before destruction. Examples of such records are as follows:
    - Personal documents, such as resumes and casual communications.
    - Initial drafts not communicated outside the creating office.
    - E-mail messages used for casual communications.
    - Annotated drafts where annotations become a part of a subsequent version, and are not evidence of decisions related to the evolution of the final document.
    - Copies for reference/information or convenience only.
    - Electronic documents which are used to produce a hard copy version which is maintained in the hard copy files.
    - Copies of publications.
    - Documents that have no corporate, legal, or archival value.

- Records found in the categories of records described above that have been designated by the National Archivist as having historic or archival importance;
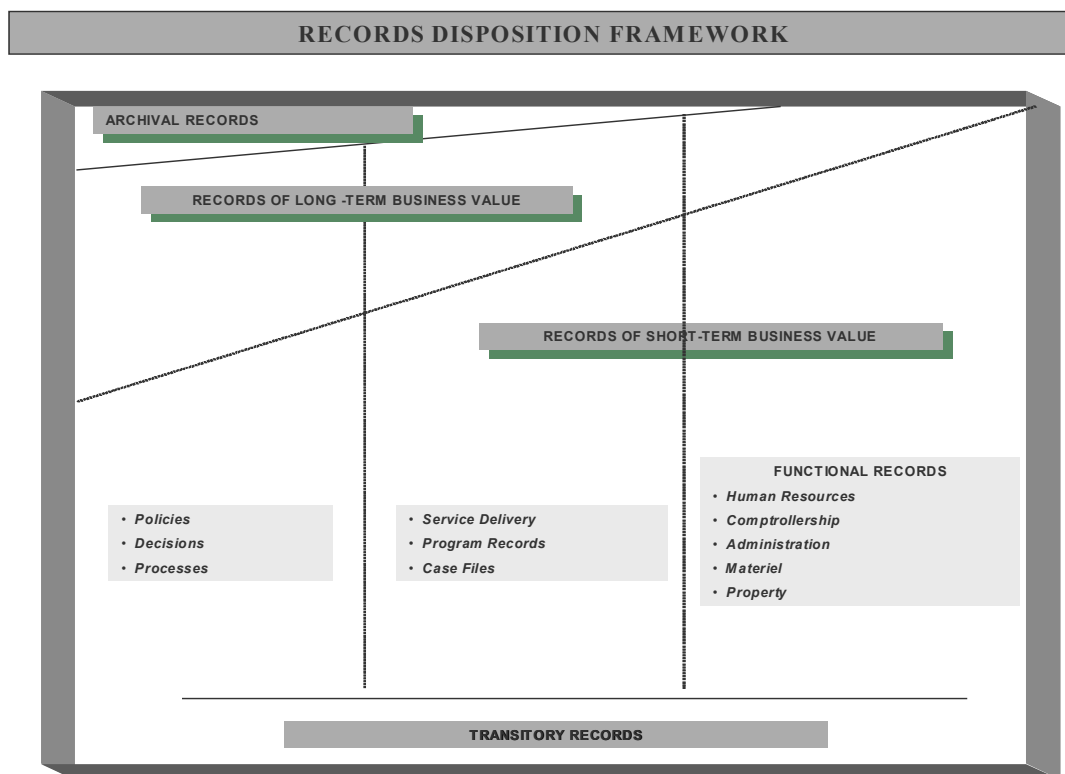

Figure 2.2: Records Disposition Framework[5]

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[5] The categorization of records was based on a similar categorization employed at the National Archives of Canada; the chart was derived from a similar chart produced by the national Archives of Canada to support its records disposition program.

3. Complying With the National Archives Act 2003

3.1 Criteria For Deciding What Is A Record[6]

According to the National Archives Act 2003 …

> *"**public records**" means records officially received or produced by any public office for the conduct of its affairs or by any public officer or employee of a public office in the course of his official duties and includes the records of any Government enterprise and also includes all records which, on the coming into operation of this Act, are in the custody or under the control of the National Archives of Malaysia established under the National Archives Act 1966 [Act 511];*

Public records provide the authoritative and authentic evidence needed to prove that a given set of transactions actually happened in the way that they did. In short, records are sources of information that document what has happened and support decisions concerning the steps that are about to be taken.

Public records are valuable to individuals, to work groups and to the organization as a whole. While it may be relatively easy to establish what individuals may want to have in place as >records= to serve their own interests, it may be more difficult to determine what should be in place to serve the interests of a given work group or the organization as a whole. The following criteria should be employed to guide decisions concerning what kinds of records should be in place to document decisions and activities[7]:

- The significance of the specific action taken (e.g. review, opinion requested/given, decision made, etc.) warrants records to be kept.
- Records need to be in existence to support the >story@ of what happened in a given set of business process/workflow transactions.
- Records need to be in existence to serve as important sources of information upon which subsequent decisions and/or actions can be taken.
- Records need to be in existence to serve as evidence to prove that certain decisions/actions were taken.
- Certain laws and policies stipulate the nature of the record that needs to be in place to document activities undertaken pursuant to the laws and policies.
- Records need to be in existence to document the rights of individuals and organizations.

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[6] This guidance was based on guidance contained in, *Records Management and Industry Canada*, Industry Canada, 2002

[7] These criteria were based on criteria described in, ISO Standard 15489, *Information and Documentation - Records Management*, 2001

When trying to decide about what records should be kept to document decisions and actions it is important not to start by thinking about the records. Start with the work activity and its associated transactions. What is the nature of the activity and its associated actions and transactions? Are they highly significant in terms of the mandate and functions of the organization, the potential they have for requiring evidence to be provided for accountability purposes or their potential for serving as important information sources? The greater the significance, the greater the need to apply discipline to the identification of the records that should be in place to document the given activity.

3.2   Establishing Appraisal Agreements[8]

3.2.1 What are Appraisal Agreements?

An appraisal agreement enables a public office to meet its obligations under the National Archives Act (2003).

The first obligation is to seek the authority of the National Archivist before disposing of records. According to Section 26 of the National Archives Act (2003):

> *"No person shall, except with the prior written consent of the Director General (of the Arkib Negara Malaysia) destroy or authorize the destruction of any public records which are in the custody or under the control of that person"*

The second obligation is to transfer to the control of the National Archives those records that have been assessed by the National Archives as having archival value. According to Section 28 of the National Archives Act (2003):

> *"Subject to subsection (2) the following public records which are in the custody or under the control of a public office shall be transferred by the administrative head of the public office to the custody and control of the National Archives:*
> *(a) any public records which have been concluded for a period of more than five years;*
> *(b) any electronically produced record*
> *(c) any non-current public records which in the opinion of the Director General (of the National Archives) are of permanent and enduring national or historical value or both."*

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[8] The guidance provided in this section was based on the significant adaptation of guidance provided by the National Archives of Canada in support of its records disposition program

These obligations are to be met through records disposal schedules. According to Section 27 of the National Archives Act (2003):

> *"(1)The administrative head of a public office shall prepare and submit a record disposal schedule in the prescribed form for the disposal of public records to the Director General (of the National Archives) for his approval.*
> *(2) The Director General may approve the record disposal schedule submitted under section (1) and, in approving such schedule, may impose any requirement or conditions as he thinks fit.*
> *(3) For the purpose of this section, "records disposal schedule" means a schedule identifying those records of archival value to be preserved and authorizing the destruction of the remaining records after the lapse of specified retention periods."*

Failure to meet these obligations carries penalties. According to Sections 25 and 28 of the National Archives Act (2003) any person who contravenes the requirement to seek the authority of the Director General for the destruction of records or the requirement to transfer to the control of the National Archives records appraised as having archival value:

> *"Commits an offence and shall on conviction be liable to a fine not exceeding five thousand ringgit or to imprisonment for a term not exceeding one year or both."*

The appraisal agreement demonstrates that these obligations have been met. It comprises the following:

a) The Submission

This is normally in the form of a letter from the public office requesting authority to dispose of records (see Appendix B for an example). Attached to the letter are a description of the relevant functions and activities and an overview description of the purpose, extent and subject matter of the records to be covered by the authority. Conditions governing retention or access to the records may also be included. Much of this information is drawn from the *Functions and Activities Report* (see below) prepared by archivists at the National Archives in cooperation with the public office.

b) The Record Disposal Schedule

The schedule comprises two instruments:

The Records Disposition Authority

The records disposition authority (see Appendix B for examples) is the formal instrument by which the National Archivist authorizes the destruction of public records. Destruction of public records will only be provided via disposition authorities. This means that public offices may destroy or transfer only those records for which there are disposition authorities. It must continue to maintain all other records that it creates or receives in the fulfilling its business requirements indefinitely as long as no approved disposition authority is created. Note that electronic records which are lost due to technological obsolescence are considered destroyed.

Records Disposition Authorities are granted by the National Archivist to government institutions in two ways:

- On a public office-specific basis, through the provision of records disposition authorities which cover the unique records managed by a single public office and which allow the public office to dispose of such records according to the terms and conditions of an agreement negotiated between the National Archives and the public office. Institution specific authorities are established in accordance with the *Multi-Year Disposition Plan* (MYDP) negotiated between the National Archives and the individual government institution responsible for a given set of programs.

- On a multi-institutional basis, through the provision of *General Records Disposition Authorities for Functional Records* that cover records (e.g. financial, human resources, etc.) managed by all or a multiple number of government institutions. These authorities provide a 'blanket' authorization for public offices to dispose of their functional records. Copies of the *General Records Disposition Authorities for Functional Records* are available from the National Archives.

Terms and Conditions for the Transfer of Archival Records

Terms and Conditions for the Transfer of Archival Records set out the specifications concerning how public records appraised as having archival value will be managed and protected until their transfer to the National Archives and the manner in which the transfer will take place. The identification of government records of archival value is accomplished by archivists from the National Archives based on information in the *Functions and Activities Appraisal Report* and the *Records Appraisal Report*. Normally archivists will review individual records or series of records to confirm the archival value of the records. The records themselves are only examined:

- To test, confirm and validate the hypotheses about the significance of the records creator or records-creating process or function.
- To help determine the nature (policy documents, operational program records, case or transaction files) and physical extent of records required to provide sufficient archival documentation of creator activities within their relevant business process or functional profile.
- To facilitate decisions concerning the best recording medium in which to capture archival records (i.e., electronic records, paper-textual records, architectural plans, maps or drawings, photographs, documentary art, etc., or a combination of some or all of these recording media).

The results of this review are developed into an agreement negotiated between the National Archives and the relevant public office manager who has the authority to sign off on the disposition of records within the public office. The *Terms and Conditions for the Transfer of Archival Records*, which specifies the timing of transfers and other terms and conditions, is normally appended to the disposition authority.

In effect, the agreement covers the transfer of those records of a given function or activity designated as having archival value, while the disposition authority authorizes the disposition of the non-archival records.

3.2.2 What Needs to be in Place Before Establishing Appraisal Agreements?

The appraisal agreement is based on three documents, all of which are prepared by archivists at the National Archives in cooperation with officials from the public office.

a) The Multi-Year Records Disposition Plan

A *Multi-Year Disposition Plan* (MYDP) is a planning document negotiated between the National Archives and a public office. The plan identifies the broad functions of the institution and the organizational units responsible for the functions. It also sets out the timetable describing when the disposition submissions covering the records associated with the functions will be prepared. Although the functions are normally broad in scope (e.g. Bankruptcy, Patents, etc.) there are occasions when they may be defined in more specific terms to account for factors such as the uniqueness of the activity, the transfer of an activity to another jurisdiction, etc.

The plan identifies the projects that will be carried out over a given period of time to develop the submissions that will be presented to the National Archivist in order to obtain the required disposition authorities. The plan is based on the results of an analysis, by NA archivists, of the functions and activities of the institution in order to identify those expected to generate records of high potential archival and historic interest. Other factors considered in establishing the plan include the readiness of given functions and activities to establish authorities, the degree of urgency with which records retention issues in certain functions and activities need to be addressed, and the opportunities that may be presented to set precedents or to lever the high interest being expressed by program managers in certain functions and activities.

b) The Functions and Activities Appraisal Report

Functions and Activities Appraisal Reports are prepared by archivists from the National Archives based on information provided by public offices in line with the *Multi-Year Disposition Plan* They are in the form of narrative reports containing high level descriptions of the mandates, organizational structures, functions and activities, business processes, etc. of specific government programs identified in the MYDP. Some of the criteria that are considered in the development of a *Functions and Activities Appraisal Report* include:

- The relevance of the function or activity to the rights and obligations of the government and citizens.

- The records management capacity (existence or state of file classification plan, disposition authorities) of the public office.

- The role or influence of the function or activity in terms of the development of policy and legislation.

Overall, the purpose of the reports is to help set the stage for the development of *Records Appraisal Reports (see below)* by describing the business context within which the records are being generated.

Functions and Activities Appraisal Reports identify those specific functions and activities in a given program, which should be documented and, wherever possible, identifying the offices most closely concerned with the function or activity as a potential source for the acquisition of records. *Functions and Activities Appraisal Reports* clearly delineate the boundaries of the public office to which the appraisal applies (i.e. if the boundaries are not clear, *Functions and Activities Appraisal Reports* may be applied to public offices that were not reviewed, or are governed by another appraisal report).

The information that forms the basis for the reports is drawn from interviews with relevant officials, existing documents describing the functions and activities landscape (e.g. program planning documents, annual reports, etc.), and inventories or directories of records and application systems prepared by public offices (see Appendix A for guidance on developing an inventory of records and application systems). An important instrument is the classification system established by the public office for the records of the program, if it exists. Such a system provides a basis not only for facilitating access to the records of the program and protection of the records from deliberate or inadvertent tampering, but also for controlling and documenting the retention of records.

A *Functions and Activities Appraisal Report* may contain the following appendices:

- Detailed analyses of program functions, activities, business processes, etc.

- An inventory of records and application systems held by the public office.

- A copy of the office's file classification plan.

- A listing of all current disposition authorities.

- Information concerning the security classification of records

As much as possible the information required by archivists to conduct a functions and activities appraisal is provided by public offices based on directories, classification systems, reports, etc. that would normally be expected to be in place in any public office.

c) The Records Appraisal Report

A *Records Appraisal Report* is a narrative assessment of specific series of records. It is based on information provided in the *Functions and Activities Appraisal Report* and discussions with various officials in the public office. The focus of the appraisal is on identifying records that most effectively and comprehensively document significant functions or programs identified in Functions and Activities Appraisal Report. *Disposition authorities* and *Terms and Conditions for the Transfer of Archival Records* are based on the information provided in the *Records Appraisal Report*.

Archival records are those that:

- Provide evidence about the policies and activities of the creating public office within the Malaysian government and with the larger client community it serves.

- Document the rights and obligations of individuals and organizations, including the Government of Malaysia.

- Contribute to the political, scientific, and cultural history of Malaysia.

Within this context, specific criteria that influence the appraisal decision (including the *Terms and Conditions for the Transfer of Archival Electronic Records*) are as follows:

- Access privileges that governed the creation and use of the records

- Procedures in place protecting the records from loss or corruption

- The presence of authentication components (e.g., digital signatures)

- How directly the records contributed to the development of legislation or policy

- The relationship with other records of the public office

- The relationship with records of other public offices (or other jurisdictions)

- Whether there are any legislated requirements for preservation

- Whether the records are decision documents (communicating when, how, and why decisions were made or actions taken)

- Whether the records affect the rights and obligations of the government and citizens

- Whether the records provide evidence of the government's interaction with citizens (e.g., case files)

- Whether the records formed advice to senior managers in the Government

- Whether the records are encrypted

- Whether the records are unique

- Whether the record content exists in the same or other media

This list of appraisal criteria is not exhaustive and new criteria may be added in consultation with the public office. Criteria already adopted for use in appraising non-electronic records is often considered for use in the appraisal of electronic records.

Retention of Government Records

In addition to the documents described above, a fundamental condition for establishing appraisal agreements is to ensure that records generated by public offices are managed properly. The execution of *Terms and Conditions for the Transfer of Archival Electronic Records* cannot occur unless the records are organized and described and unless retention specifications are in place and capable of being acted upon.

While the *Terms and Conditions for the Transfer of Archival Electronic Records* will specify how long archival records are to be retained by the public office before being transferred to the control of the National Archives, the *Disposition Authority* authorizing the disposition of records does not provide direction regarding the timing of records destruction. The determination of retention periods for records managed by government institutions is the responsibility of individual institutions.

The determination of retention specifications for government records is based on discussions between the records management office in a given institution and designated program officials (based on advice from legal services, etc.) and using corporately defined criteria. These criteria can range from the length of time the records will be of value to the organization, to the costs of maintaining records through time, to the impact of various legal requirements prescribed by law.

An important pre-requisite is a records classification scheme. The classification of records is normally based on a logical or physical grouping reflecting the functions and activities of the program areas of the institution. It is described according to a top-down model beginning with the highest-level description of the functions of the institution (normally about 3 to 5) and proceeding downwards through a hierarchy of activities, sub-activities and sub-sub activities. By adopting the program/activity structure of the institution, the classification scheme helps to situate records within the administrative and operational context they are documenting. Such a scheme should be established regardless of the physical form of the records. The use of a common classification scheme not only facilitates the establishment of links between related records (i.e. electronic and hard copy) it also enables a consistent approach to be taken to the assignment of retention specifications (i.e. retention periods for electronic records and hard copy records associated with the same activity will be relatable even if they are held in different locations).

Public offices should contact the National Archives for advice on the development of retention specifications and on the management of electronic records generally.

3.2.3 How are Appraisal Agreements Established?

The steps involved in establishing appraisal agreements are as follows:

1. A *Multi-Year Disposition Plan* (MYDP) is negotiated between the National Archives and a government institution.

2. The individual disposition *Submissions* are prepared in accordance with the timetable set out in the MYDP. Normally archivists from the National Archives lead the preparation of a *Functions and Activities Appraisal Report* in cooperation with an officer from the records management office and the responsible contact in a given functional area. The *Functions and Activities Appraisal Report* is normally in the form of a summary description of the activities of a given function and a generic description of the kinds of records associated with the function and its activities. Once the draft *Functions and Activities Appraisal Report* is prepared, it is reviewed by the responsible contact and a final draft is endorsed by the senior program manager responsible for the program. A draft of the *Functions and Activities Appraisal Report* may be reviewed informally by the National Archives before it is endorsed by the senior program manager.

3. The *Functions and Activities Appraisal Report* is forwarded to the National Archives for review under a covering letter (see appendix B) signed by an appropriate senior official in the public office. The National Archives accepts the *Functions and Activities Appraisal Report* by means of an acknowledgement letter sent to the senior official in the institution.

4. An archivist from the National Archives will prepare a *Records Appraisal Report* based on an appraisal of the records covered by the *Functions and Activities Appraisal Report*. If some or all of the records are assessed as having archival value, then terms and conditions for their transfer are negotiated between the National Archives and the responsible manager of the public office supported by the records management office. Once the draft *Terms and Conditions for the Transfer of Archival Electronic Records* are endorsed by the public office manager and the records manager, the National Archives will forward a letter of agreement (see Appendix B) with the final version of the *Terms and Conditions for the Transfer of Archival Electronic Records*, to the public office manager. Normally the terms and conditions stipulate how long the records designated as archival are to be retained by the institution and how they are to be managed and protected before they are transferred to the National Archives. Once the draft agreement is endorsed by the public office manager, the National Archives will forward a final version to the public office manager.

5. The signed agreement is then sent to the National Archives where it is signed by the relevant senior manager in the National Archives (i.e. the agreement does not need to be signed by the National Archivist because it does not involve the destruction of records; the National Archivist signs the disposition authority).

6. The agreement is then attached to a *Disposition Authority* form by archivists in the National Archives. There are three types of authority forms (see Appendix B). One form is for those cases where some archival records are to be transferred, another is for cases where all of the records are to be transferred, and a third is for cases where there are no archival records to be transferred. The unsigned authority form, the signed transfer agreement (if applicable), complete with the *Terms and Conditions for the Transfer of Archival Electronic Records*, and the *Submission,* are forwarded to the National Archivist for review and approval.

7. Once the *Disposition Authority* is signed by the National Archivist, a notification letter, the signed Di*sposition Authority*, and the agreement with the *Terms and Conditions for the Transfer of Archival Electronic Records* are forwarded to the relevant officials in the public office.

8. The *Disposition Authority* is used to confirm the disposition status of records associated with the various functions of the institution. It is also used as the basis for the transfer of records to the records center. The *Terms and Conditions for the Transfer of Archival Electronic Records* are used to govern the systematic transfer of archival records to the National Archives.

9. Public offices are responsible for maintaining their records with authenticity, integrity, reliability and usability intact for the duration of the retention requirement indicated on the disposition authority and in the *Terms and Conditions for the Transfer of Archival Electronic Records*. This may require preservation strategies to be developed and implemented for electronic records particularly vulnerable to format obsolescence (e.g. CAD files).

10. *Appraisal Agreements* should be reviewed every five years.

3.3 Implementing Appraisal Agreements

Public offices will implement appraisal agreements (complete with their disposition actions) systematically as a routine records management activity. Implementation of appraisal agreements will be the responsibility of the public offices and is governed by the following considerations:

- ▪ Assurance that the records are no longer required (i.e., that the indicated retention requirement is appropriate).

- ▪ The records are not required for investigations or litigation.

Disposal actions, i.e., transfer to the Arkib Negara Malaysia or destruction, should always be documented and logged. Logs and other records created in implementing disposal actions must be kept to maintain an audit trail of disposal activities.

3.3.1 Transferring Archival Electronic Records to the ANM

The transfer of electronic records to the ANM is a joint responsibility between the ANM and the public office. The goal is to ensure that the designated records are transmitted from the public office to ANM completely with their qualities of authenticity, reliability, integrity, and usability intact.

Transferring electronic records to the ANM is a staged process that must meet defined transfer specifications contained in the appraisal agreement. Transfer specifications must be defined to ensure that:

- All the digital components comprising the records are transferred

- The ANM is able to make the transferred records accessible, i.e., that the digital components can be retrieved to properly produce the records

- Any special requirements prior to transfer (conversion, de-encryption, etc.) are undertaken

- The best file format in which to transfer the records is determined in advance of the transfer

- That the transferred records are consistent with the descriptions on the disposition authorities governing the transfer

- That sufficient documentation and critical record metadata accompanies the transfer of records

The staged process comprises the following eight steps[9]:

Step 1: The public office will notify the ANM that they have records for transfer. The notification will indicate whether transfer requirements are already in place or need to be developed or modified.

Step 2: If the transfer requirements have not already been tested, then a transfer of test data will be undertaken to confirm that the indicated requirements are satisfactory. The test transfer will include export of test data in an agreed upon structure and format from the public office system to an agreed upon medium. The medium will be delivered to the ANM where it will be accessed and the test data reviewed. Unsatisfactory aspects of the transfer requirements will be renegotiated and another complete test will be run. The object of the test transfer is to ensure that risk to the records by the transmission from the public office to the ANM is minimized.

Step 3: During the test transfer process the public office will gather all metadata and documentation that must accompany the transferred records. These will be listed and a count of transferred records, including checksums for each computer file comprising the transfer, will be appended to the listing.

Step 4: The records will be transferred using exactly the approved transfer requirements. The records will be accompanied by their metadata and documentation.

Step 5: The ANM will review the transferred records to ensure that:

    a. The transferred records are those that were supposed to be transferred

    b. All the transferred records were received

    c. The format and structure of the records is that which was negotiated

    d. The metadata can be correctly linked to the records

    e. The documentation provides the necessary context to access and understand the records

In the event that one or more of these conditions are not met, the public office and ANM will jointly address the identified problem(s).

Step 6: Transferred media are received into the quarantine facility, where the contents are copied, using a verified write process, to new physical media.

> *The quarantine facility is a 'stand-alone' environment, allowing records to be checked and problems resolved without the risk of infecting other digital records.*

ANM staff checks against the disposition authority to confirm that the appropriate records were transferred. Then the checksums for each record are recalculated and compared against the original checksums provided by the public office. The records are then virus checked.

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[9] These steps were derived from approaches developed by the National Archives of Australia

If any of the records in the transfer fail these checks, the agency is alerted and asked to re-copy their original records onto a new transfer medium. The original transfer medium is either destroyed or returned to the agency.

Step 7: Records are maintained on removable media within the quarantine facility for four weeks after which the records are re-checked for viruses using updated virus definition files.

The four-week period between virus checks allows virus-checking software vendors time to update their software to counter new or previously unknown viruses.

Step 8: Once the records have passed all tests, they are physically moved on their media from quarantine to the preservation repository. At this point the transfer is complete and the ANM will confirm receipt of the records and update its records accordingly. This information should be reflected in the next review of the appraisal agreement between the transferring public office and the ANM.

The ANM will not normally accept records that are not governed by a disposition authority, and in turn, an appraisal agreement. Bodies of records, normally expressed in relation to an identified record series and date range, will be transferred at scheduled intervals. Individual electronic records are not acceptable for transfer. Transferred records will not include software applications.

It is the responsibility of the public offices to prepare electronic records for transfer according to the requirements of ANM. The requirements may:

- Be specific to the type of electronic records being transferred (see Appendices C,D and E)

- Pertain to a variety of electronic record types or formats which comprise the transferred records, e.g., a transfer of chief secretary's correspondence may include scanned incoming text documents in .tiff format, word-processed outgoing documents, and data extracts from a tracking database.

- Be expressed in general terms through advisory bulletins issued from time to time by the ANM.

Setting specific transfer requirements on a disposition authority years before any records are actually transferred may be problematic, particularly for electronic records in systems with limited record keeping capabilities, as system changes over time may render them inappropriate or inapplicable. Transfer requirements should be reviewed for continued applicability prior to being implemented. Where the requirements do not exist or are no longer appropriate (due to system changes, for example), or for some other reason cannot be complied with, the records manager should seek advice from ANM.

Retention of archival electronic records beyond the requirement indicated in the *Terms and Conditions for the Transfer of Archival Electronic Records* is at the discretion of the public office. The ANM must be notified of the need to extend the retention of the records by the public office. Where the requirement to extend the requirement is on going, the public office will undertake the development of a new *Appraisal Agreement.*

Transfers of electronic records will not include copies of software applications. Copies of software application documentation may accompany transferred electronic records where the documentation provides critical metadata for the transferred records, e.g., field definitions for a database application.

Upon receipt of the transfer package, the ANM must review the records, metadata, and accompanying documentation to confirm their completeness, adequacy, and the ability of the ANM to maintain the records. The transfer process is completed once that confirmation is provided. While the transferred records are being reviewed at the ANM the public office remains responsible for servicing requests for the records.

The transfer of electronic records is documented using the same procedures as for paper records, i.e., the date range of the body of records is indicated. Completed disposition forms should be forwarded to the ANM for permanent retention.

Transferred records will be accompanied by their metadata and supporting documentation in such a manner that the relationship between the records and their metadata and documentation can be preserved by the ANM. Supporting documentation is not standard and cannot be universally defined. Good documentation allows the user to read, understand and use the electronic records it describes.
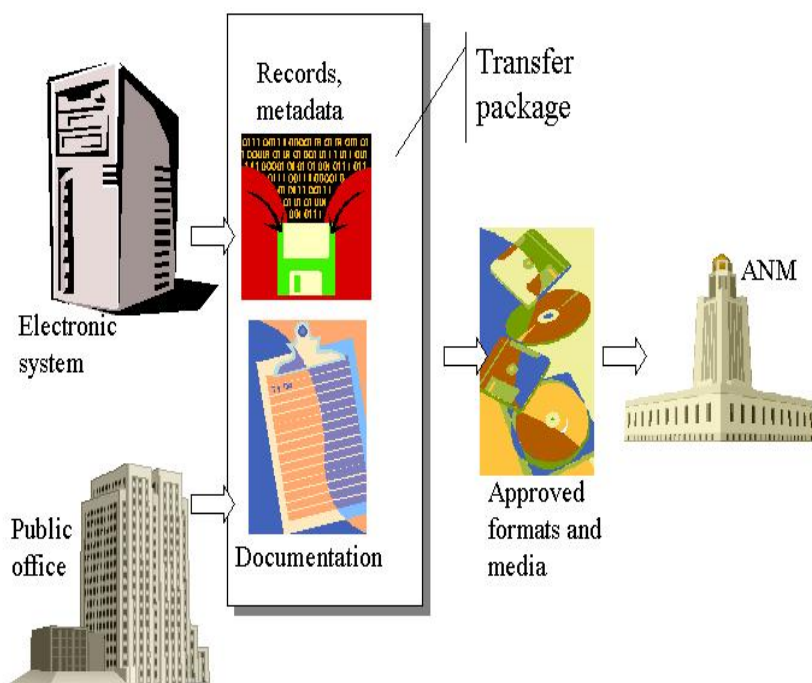
Because software is not to be transferred to the ANM, preparation of records for transfer may result in reduction in the functionality of the records. Similarly, the structure of the records may be modified to facilitate preservation management and archival access. Documentation accompanying transferred records should describe export processes and their effects on the records.

Electronic records will be transferred to the ANM on physical media, e.g., optical or magnetic removable media or hard disk, see Appendix C for list of transfer media acceptable to the ANM. See Appendix D for a list of approved file formats for records transfer.

See Appendix E for specific transfer conditions for:

- electronic mail with attachments,
- scanned images of textual documents,
- digital geospatial records,
- digital photographic records, and
- records in Portable Document Format

3.3.2 Destroying Electronic Records

Disposal actions are always applied to the whole of the series of records identified by the disposition authority. Groups of records within the series, usually specified by a date range, should be disposed of in a manner that is consistent with the retention requirement indicated on the disposition authority. Disposal actions are never carried out for individual records (e.g., a single email message or piece of correspondence).

Backup procedures and schedules should be coordinated with approved retention and disposition schedules to ensure that no copies of electronic records are maintained after the retention period of the electronic records has expired. Public offices remain responsible for records retained on backup tapes even if the records on the active systems have been disposed of in accordance with the governing disposition authority.

Public offices must take special precautions to ensure that electronic storage media is electronically cleaned (it is not sufficient to simply "delete" files) or physically destroyed in such a manner that the information cannot be reconstructed. Where removable storage media is to be reused, e.g., for tapes in a backup cycle, the *Malaysian Public Sector Management of Information & Communication Technology Security Handbook* recommends erasure of data on digital media (MYMIS 3-29) using a degausser with strength appropriate to the media being erased. Where hard disks are retired, appropriate software is required to erase all contents, it is not sufficient to simply reformat the drive.

Appendix A

Preparing An Inventory of Electronic Records in Application Systems

Inventorying records may need to be a special activity undertaken by records managers or it may already be accomplished, in whole or in part, through a business activity-based corporate file classification plan. Inventorying records will normally occur on the basis of actual inspections by records management staff of records and systems in the public offices. Where this is inappropriate, e.g., for security reasons, staff in the area will compile the inventory with guidance from the records officers.

Compiling the inventory involves collecting and maintaining information about record-keeping systems in an organization. The completed inventory will provide the basis for developing disposition authorities. Ideally, inventories should be comprehensive in scope and include all of the data and records associated with a system, regardless of media.

The following are a list of elements for inventorying of electronic records within a system. The mandatory elements of the inventory will identify and provide a minimum of description of all electronic records.

Mandatory	Name of the system: This indicates the commonly used name and acronym of the system.
	Agency program supported by the system: This states the agency program(s) or mission(s) to which the system relates and cites any laws or directives authorizing such program or missions. It also lists the names, office addresses, telephone numbers and location of the program personnel who can provide additional information about the program and the system supporting it.
	Purpose of the system: This indicates the reason(s) for the system and the requirement(s) it meets.
	Information content: This indicates the main subject matter, date coverage, time span, geographic coverage, update cycle and other major characteristics of the system. It also states whether the system keeps superseded information and whether it contains micro data (un-aggregated or un-summarized data) or summary data (data summarized from the micro data, also referred to as macro data).
	Identification of the person conducting the inventory: This gives the person's name, office, telephone number and location.
	Date prepared: This gives the date the inventory was prepared.
Optional	System control number: Where applicable, this specifies the internal control number assigned to the system for reference, control or cataloguing purposes.
	Data input and sources: This describes the primary data input sources and the providers of the data to the system.
	Major output: This shows the system's main products and the frequency of their preparation.
	Hardware/software environment: This indicates the computer system that creates, manages and manipulates this information and the software used.

	System manager(s): This lists the name, office, telephone number and location of the system manager or other system personnel who can provide more information about the system and the program it supports.
	Location of documentation needed to read and understand the files: This records where the codebooks and file layouts are maintained. It also indicates the office, room number and name of the person having custody of paper documentation. Identifies and locates any documentation that may be held in computerized form (such as CD-ROMs that accompany software).
	Restrictions on access and use: This indicates national security, privacy or other restrictions.
	Authorized disposal of the information as determined by the records schedules: This indicates the disposal decision, for example 'permanent.' If there is no schedule the inventory should indicate 'unscheduled' and recommend a disposal date.
	Disposal authority citation: This gives the records schedule and item number(s) covering the records contained in this system. It also cites any record schedule(s) and item number(s) authorizing disposal of system components, such as input forms, printouts, output reports and so on.
	Location and volume of any storage media containing identical information: This records the location of any magnetic tapes or disks containing information identical to that in the system being inventoried. It also indicates the number of tapes and/or disks and their storage capacity.
	Related systems: This identifies and shows the location of any systems that relate to the system being inventoried and documents the nature of the relationship (for example, a database on one system may draw information from a database maintained by another system).

In the creation of disposition authorities, inventory information will be expanded to include the whether the records are vital records of the office, relevant security classification requirements, the existence of specific legislation affecting the retention of records, etc.

Appendix B

Records Disposition Authorities and Archival Transfer Agreements

Relevant forms[10] –

B-1 Submission letter from the institution requesting authority to dispose of records

B-2 Disposition Authority Form - some archival records are to be transferred to the ANM

B-3 Disposition Authority Form - no archival records are to be transferred to the ANM

B-4 Disposition Authority Form - all records are archival and are to be transferred to the ANM

B-5 Archival Transfer Agreement with attached Terms and Conditions for the Transfer of Archival Electronic Records

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[10] These forms are based on similar forms employed by the National Archives of Canada in support of its records disposition program.

(DATE)

Institution's File No.:

Arkib Negara Malaysia
Jalan Duta,
50568 Kuala Lumpur

Dear:

As part of our mutually agreed upon Multi-Year Disposition Plan, signed on (date), I am submitting the attached records disposition submission for an archival appraisal. The submission describes the records of the (Submission name) of (the institution).

I understand that further information regarding the records covered by this submission may be required during the archival appraisal stage and ask that the Archivist call (name of contact), [title] at [phone]. (S/he) will arrange meetings with the program area contacts named during the submission development phase of this project.

I also understand that we will be consulted on the terms and conditions which will govern the eventual transfer of records to your institution. This will allow us to assess the impact of the terms and conditions, [set retention periods for all records identified as having archival value], and provide us with the opportunity to resolve any issues or concerns before the final recommendations are forwarded to the National Archivist.

Once this submission is accepted in the National Archives, we will be able to begin the research phase of the (next) Multi-Year Disposition Plan target, that being (Name of next submission).

Yours sincerely,

Senior Official
Title

Some Records are Archival
Records Disposition
Authority No. 2004/XXX
issued to
the [name of the institution]

for records related to
[name the program, activity, Branch etc.]

The National Archivist of Malaysia, pursuant to subsections 5(1) and 6(1) of the *National Archives Act 2003,* is of the opinion that records described in the attached Agreement are of historic or archival importance. The National Archivist, therefore, requires their transfer to the care and control of the Arkib Negara Malaysia in accordance with the terms and conditions set out in the Appendix to the Agreement, and consents to the disposal of all other records described in the Records Disposition Submission, also attached, when [NAME THE INSTITUTION] decides that these records have no remaining operational or legal requirements.

Attachments:

(1) Agreement for the Transfer of Archival Records

(2) Records Disposition Submission

_____

Signature: National Archivist

Date: _____

No records are archival

**Records Disposition
Authority No. 2004/???**

issued to

The [name the institution]

for records related to

[name the program, activity, Branch etc.]

The National Archivist of Malaysia, pursuant to subsection 5(1) of the *National Archives Act 2003*, consents to the disposal of all records described in the attached Records Disposition Submission when [NAME THE INSTITUTION] decides that these records have no remaining operational or legal requirements.

Attachment:

Records Disposition Submission

_____

Signature: National Archivist

Date: _____

All records are archival
**Records Disposition
Authority No. 2004/???**

issued to

The [name the institution]

for records related to

[name the program, activity, Branch etc.]

The National Archivist of Malaysia, pursuant to subsections 6(1) of the *National Archives Act 2003,* is of the opinion that all records described in the attached Records Disposition Submission are of historic or archival importance and requires their transfer to the care and control of the Arkib Negara Malaysia in accordance with the terms and conditions set out in the Appendix to the Agreement for the transfer of archival records, also attached.

Attachments:

   (1) Agreement for the Transfer of Archival Records

   (2) Records Disposition Submission

<div align="center">

Agreement for

the Transfer

of Archival Records
between

NAME OF INSTITUTION

and

the National Archives of Malaysia

pertaining to

Records Disposition Authority

No. 2004/XXX

</div>

In accordance with the *National Archives Act 2003*, the records described in the terms and conditions set out in the Appendix have been identified by the National Archivist as being of historic or archival importance.

NAME OF INSTITUTION will transfer the records so described to the care and control of the National Archivist according to the timetables and other conditions specified in the terms and conditions set out in the Appendix.

Access to and care of the records transferred to the National Archives of Malaysia will be governed by the policies and procedures of the National Archives governing the use of records by the public and departmental officials.

On behalf of NAME OF INSTITUTION, I will ensure the transfer of the records described in the terms and conditions set out in the Appendix, according to the specified retention periods.

<div align="center">

Name
Title
Name Of Institution

Date

</div>

On behalf of the National Archivist, I accept the care and control of the archival records transferred in accordance with this agreement.

<div align="center">

Arkib Negara Malaysia

Date:

</div>

Appendix: Terms and Conditions for the Transfer of Archival Records

Appendix C
Transfer Media

On-line transfers

- File Transfer Protocol (FTP) – will be used only for the transfer of unclassified, uncompressed, unrestricted, and unencrypted files.

Removable media

- Super DLT (SDLT) cartridge tape (uncompressed)
- Digital Linear Tape (DLT IV) cartridge tape (uncompressed)
- Linear Tape – Open (LTO) cartridge tape
- 8mm tape
- Compact Disc – Recordable (CD-R)
- Digital Versatile Disc – Recordable (DVD-R)
- External or removable hard drives, e.g., USB connected
- Open reel 9-track tape
- 3480 class tape cartridges

Appendix D
Transfer formats

- Character Sets:
    - American Standard Code for Information Interchange (ASCII) [ISO/IEC 8859-1:1998 (Latin-1)]
    - Extended Binary Coded Decimal Interchange Code (EBCDIC)
    - Unicode Version 3.0 UTF-8 [ISO/IEC 10646-1:2000]

- Digital Audio
    - Audio Interchange File Format (AIFF)
    - WAVE (WAV)
    - MPEG-1: Layer 3 (MP3)
    - Musical Instrument Digital Interface (MIDI)
    - Real Audio (RM/RA)

- Digital images
    - Portable Network Graphics (PNG)
    - Tagged Image File Format (TIFF)
    - Graphics Interchange Format (GIF)
    - Joint Photographic Experts Group (JPEG) [ISO/IEC 10918-1:1994]
    - JPEG File Interchange Format (JFIF)

- Digital video
    - Moving Pictures Expert Group (MPEG-2)
    - Audio Video Interleave (AVI)
    - MPEG-4
    - Quicktime (MOV)
    - Real Networks' RealVideo (RM)

- Documents – Textual
    - Extensible Markup Language (XML)
    - HyperText Markup Language (HTML)
    - Standard Generalized Markup Language (SGML) [ISO/IEC 8879:1986]
    - Text Files (.txt)
    - Microsoft Word Document Format (.doc)

- WordPerfect Document Format (.wpd)

- Email
  - Multipurpose Internet Mail Extensions (MIME)

- Geospatial Data
  - Digital Line Graphs – Level 3 (DLG-3)
  - Environmental Systems Research Institute (ESRI) Export Format – (E00)
  - Environmental Systems Research Institute (ESRI) Shape Format – (SHP)
  - GeoTIFF
  - Geography Markup Language (GML), Version 3
  - International Hydrographic Organization (IHO) S-57, Edition 3.1
  - TC 211 ISO 191xx Standards for Geographic Information
  - Spatial Data Transfer Standard (SDTS)
  - CARIS ASCII
  - CEOS Superstructure Format
  - Digital Elevation Model (DEM)

- Structured Data – Databases and Spreadsheets
  - Flat File (e.g., comma separated value, .csv)
  - dBase Format (DBF)

- Technical Drawings
  - Drawing Interchange File Format (DXF)

Appendix E

Special Transfer Conditions[11]

The following five sets of transfer instructions for
- Email messages with attachments
- Scanned images of textual records
- Records in Portable Document Format (PDF)
- Digital photographic records
- Digital geospatial records

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[11] These transfer specifications are based on similar specifications employed by the US National Archives and Records Administration.

Transfer Instructions for Existing Email Messages with Attachments

1.0 PREFACE

This guidance expands currently acceptable formats to allow the transfer of email messages and their attachments to the Arkib Negara Malaysia.

2.0 TRANSFER CRITERIA

In addition to ASCII text formats, Arkib Negara Malaysia will accept transfers of permanent email messages and their attachments (email records) to Arkib Negara Malaysia in standard markup language, or in their native formats according to the following:

2.1 Transfers of email records must consist of an identifiable, organized body of records (not necessarily a traditional series, e.g., the email records of the Secretary from the past fiscal year).

2.2 Email transfers should come from email systems or from a record keeping system. If they are to be sent from some other kind of system, first contact Arkib Negara Malaysia.

2.3 For preservation purposes, Arkib Negara Malaysia prefers that agencies transfer email and their attachments in a markup language format that contains:

2.3.1 Delimiters to indicate the beginning and end of each message and the beginning and end of each attachment, if any. Each attachment must be differentiated from the body of the message, and uniquely identified.

2.3.2 Labels to identify each part of the message (Date, To [all recipients, including cc: and bc: copies], From, Subject, Body, and Attachment) including transmission and receipt information (Time Sent, Time Opened, Message Size, File Name, and similar information, if available). Public offices that use an email system that identifies users by codes or nicknames, or identifies addressees only by the name of a distribution list[12] should include information with the transfer-level documentation, to ensure identification of the sender and addressee(s).

2.4 If a markup language cannot be produced, Arkib Negara Malaysia will accept email messages and their attachments in their native formats. Each attachment should be labeled with its filename and the default file extension to indicate the proprietary software used to create the attachment. If attachment file names do not include the default file extension (e.g., .doc, .xls), agencies must provide documentation identifying the proprietary formats used to create each attachment.

2.5 At this time Arkib Negara Malaysia will not accept email messages that have been converted to a Portable Document Format (PDF) or other image file format for purposes of transfer.

2.6 Attachments to email messages may be transferred in their native formats, such as PDF, other image file formats, and common office automation formats.

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[12] DoD 5015.2-STD (TABLE C2.T4.) Transmission and Receipt Data, Footnote 1 defines intelligent names as clear, uncoded, identifications of the individual.

3.0 TRANSFER DOCUMENTATION

In order to ensure that each body of email records transferred to Arkib Negara Malaysia is clearly described agencies must separately supply documentation that identifies:

- Email application and version(s) (e.g., Microsoft Exchange v5.5)

- Operating system and version(s) (e.g., Microsoft Windows NT v4.0)

- RMA (if applicable) and version

- Total number of messages

- Total number of attachments

- List of message delimiters and definitions

- Structure used for each email item in the transfer

- Arrangement of records in the transfer

4.0 TRANSFER INFORMATION

4.1 For preservation processing purposes, Arkib Negara Malaysia prefers that email transfers be contained within a single uncompressed file.

4.2 Agencies may also transfer records on Type IV Digital Linear Tape or through File Transfer Protocol (FTP). FTP transfers currently are limited to a maximum size of five Gigabytes (5 GB). For FTP transfers, the offering agency must provide the following information to Arkib Negara Malaysia:

- IP address for the Agency FTP site,

- A temporary user name and temporary password for Arkib Negara Malaysia to use in accessing the Agency FTP site,

- A designated time or time span for Arkib Negara Malaysia to access the records and download a copy to Arkib Negara Malaysia.

5.0 LEVELS OF ACCESS

The level of access will vary according to the formats in which the email records were transferred. At the present time Arkib Negara Malaysia provides users with a copy of fully releasable electronic record files on any of the media endorsed by the Arkib Negara Malaysia. For email messages and attachments transferred to Arkib Negara Malaysia in proprietary formats (e.g., PDF, Microsoft Outlook), the user will be responsible for obtaining the necessary hardware and software to view the records.

Transfer Instructions for Scanned Images of Textual Records

1.0 PREFACE

This guidance expands currently acceptable formats to enable the transfer of existing scanned images of textual records[13] to Arkib Negara Malaysia. The guidance does not apply to "born digital" images or scanned images of primarily non-textual records (e.g., maps and photographs).

2.0 BACKGROUND

The following sections provide transfer requirements specifically for existing scanned images that have been appraised or scheduled for permanent retention in electronic (i.e., scanned) form. These requirements address acceptable scanned image file formats, image quality specifications, transfer documentation, and related information on how to transfer these records to Arkib Negara Malaysia. If an agency has existing permanent scanned images that do not meet the image quality specifications in this guidance, contact the Arkib Negara Malaysia.

3.0 TRANSFER REQUIREMENTS FOR SCANNED IMAGES OF TEXTUAL RECORDS

Effective upon promulgation of these requirements, Arkib Negara Malaysia will accept transfers of scanned images that have been scheduled as permanent records. To facilitate preservation processing and future access to these records, agencies must comply with the following minimum requirements.

3.1 Image File Format

3.1.1 Arkib Negara Malaysia will accept scanned images in the following file formats:

> 3.1.1.1 **Tagged Image File Format (TIFF)**, in 'II' format,[14] versions 4.0 (April 1987), 5.0 (October 1988), and 6.0 (June 1992).
>
> 3.1.1.2 **Graphics Interchange Format (GIF)**,versions 87a (June 1987), and 89a (July 1990).
>
> 3.1.1.3 **Basic Image Interchange Format (BIIF)**, International Standards Organization (ISO) Standard 12087-5, Part 5 (December 1998).
>
> 3.1.1.4 **Portable Network Graphics (PNG)**, version 1.0 (October 1996).

3.1.2 Arkib Negara Malaysia will periodically update this set of acceptable formats and versions.

3.1.3 Arkib Negara Malaysia prefers uncompressed images; with prior consultation between Arkib Negara Malaysia and the transferring agency, Arkib Negara Malaysia may accept compressed images created using a lossless compression method (e.g., ITU Group 4, LZW) when it is impractical or technically impossible to transfer uncompressed files (e.g., due to limitations on bandwidth or storage media capacities). Arkib Negara Malaysia will not accept images created using lossy compression

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[13] Hereafter stated as "scanned images."

[14] "In the 'II' format (i.e., little-endian), byte order is always from the least significant byte to the most significant byte."

techniques because the potential information loss that can result from compression can make such images unsuitable for archival preservation.

3.2 Acceptable Image Quality Specifications

Scanned images of textual records transferred to Arkib Negara Malaysia must meet the following minimum requirements for scanning resolution and pixel (bit) depth to support archival preservation and continued use.

3.2.1 *Bitonal (1-bit) scanned at 300-600 ppi.*[15]
This is appropriate for documents that consist exclusively of clean printed type possessing high inherent contrast (e.g., laser printed or typeset on a white background). Scanning at 600 ppi is recommended.

3.2.2 *Gray scale (8-bit) scanned at 300-400 ppi.*
This is appropriate for textual documents of poor legibility because of low inherent contrast, staining or fading (e.g., carbon copies, thermofax, or documents with handwritten annotations or other markings), or that contain halftone illustrations or photographs. Scanning at 400 ppi is recommended.

3.2.3 *Color (24-bit RGB [Red, Green, Blue]) scanned at 300-400 ppi.*
Color mode (if technically available) is appropriate for text containing color information important to interpretation or content. Scanning at 400 ppi is recommended.

3.3 Transfer Documentation

3.3.1 For each transfer, agencies must supply documentation that identifies:
   3.3.1.1 Imaging system and version(s) (i.e., application software and storage system)
   3.3.1.2 Operating system and version(s)
   3.3.1.3 Records Management Application (if applicable) and version(s)
   3.3.1.4 Image file format(s) and version(s)
   3.3.1.5 Image quality specifications (i.e., resolution, pixel (bit) depth, compression technique)
   3.3.1.6 Total number of documents in the transfer
   3.3.1.7 Total number of images in the transfer
   3.3.1.8 Arrangement of files on the transfer media
   3.3.1.9 Structure of image header (if applicable)

3.3.2 In addition, agencies must supply the following:
   3.3.2.1 Control information necessary to enable retrieval of each file, including whether the file is a single image or multiple images. Such information can be conveyed through metadata (e.g., a thumbnail index), captured for each document either in the image header or in accompanying documentation.

   3.3.2.2 Finding aids, indexes, and other information used to retrieve the records also must be transferred to Arkib Negara Malaysia to support future access to the records.

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[15] PPI denotes pixels per inch.

3.3.2.3 The Optical Character Recognition (OCR) versions of the images (i.e., additional files enabling full text searches linked to the appropriate scanned image), if available.

3.3.3 Agencies also must supply a description of the quality control inspection performed as part of the imaging process and a report on the results of the last inspection performed on the images and the date of that inspection.

4.0 TRANSFER MECHANISMS

4.1 Agencies must transfer scanned images as uncompressed file(s).

4.2 Agencies must transfer scanned images as unaggregated file(s).

4.3 Agencies may transfer records on Digital Linear Tape (DLT) Type IV or through File Transfer Protocol (FTP). FTP transfers currently are limited to a maximum size of five Gigabytes (5 GB). For FTP transfers, the offering agency must provide the following information to Arkib Negara Malaysia:

- IP address for the Agency FTP site,

- A temporary user name and temporary password for Arkib Negara Malaysia to use in accessing the Agency FTP site,

- A designated time or time span for Arkib Negara Malaysia to access the records and download a copy to Arkib Negara Malaysia.

5.0 LEVELS OF ACCESS

Arkib Negara Malaysia's ability to provide access to certain records will vary according to their hardware and software dependencies. At the present time, Arkib Negara Malaysia provides users with a copy of fully releasable electronic record files on any of the media currently approved by Arkib Negara Malaysia. For scanned images transferred to Arkib Negara Malaysia the user will be responsible for obtaining the necessary hardware and software to view the records.

Transfer Instructions for Electronic Records in Portable Document Format (PDF)

1.0 PREFACE

This guidance expands currently acceptable formats to enable the transfer of records in Portable Document Format (PDF) to Arkib Negara Malaysia.

This guidance provides transfer requirements for:

- all records in PDF,

- records converted to PDF from their native electronic formats (e.g., office automation products),

- records converted to PDF from scanned paper or image formats such as TIFF.

Additionally, sections 3.5 and 4.0 provide transfer requirements including transfer documentation and related information on how to transfer PDF records to Arkib Negara Malaysia.

1.1 Effective Dates

This guidance applies to all PDF records that have been appraised or scheduled for permanent retention. The effective dates are based on when the PDF records are created.

March 31, 2003. The requirements in this guidance are effective March 31, 2003, for **all** permanent PDF records created prior to April 1, 2004.

April 1, 2004. The effective date of the following **additional** provisions has been deferred until April 1, 2004, to allow agencies time to implement them:

- deactivate all security settings before transfer (section 3.2.1.2),

- embed all referenced fonts (section 3.3.1.2).

Arkib Negara Malaysia recognizes that legacy records and records whose disposition is changed from temporary to permanent may present unique circumstances for agencies. Any agency that has permanent PDF records that do not meet the requirements in this guidance should contact the Arkib Negara Malaysia appraisal archivist assigned to that agency to determine the most appropriate medium and format for transfer (see section 6.0).

3.0 Transfer Requirements for PDF Records

Arkib Negara Malaysia will accept transfers of PDF records that have been scheduled as permanent records. Any agency that has permanent PDF records that do not meet the requirements in this guidance, should contact the Arkib Negara Malaysia appraisal archivist assigned to that agency (see section 6.0).

To facilitate preservation processing and future access to these records, agencies must comply with the following minimum requirements:

3.1 PDF File Specification for All PDF Records

3.1.1 PDF records must comply with PDF versions 1.0 through 1.4 (i.e., all existing PDF versions as of the effective date of this guidance) and meet the requirements outlined in sections 3.2 through 3.4.

3.1.2 Arkib Negara Malaysia periodically will update the list of acceptable PDF versions as required.

3.2 General Requirements for All PDF records

3.2.1 Security Requirements

    3.2.1.1 PDF records must not contain security settings (e.g., self-sign security, user passwords, and/or permissions) that prevent Arkib Negara Malaysia from opening, viewing or printing the record.

    3.2.1.2 In addition, PDF records created after April 1, 2004, must have all security settings deactivated (e.g., encryption, master passwords, and/or permissions) prior to transfer to Arkib Negara Malaysia. Deactivating security settings ensures Arkib Negara Malaysia's ability to support long term migration and preservation of the records.

3.2.2 Review of Special Features

Because of the complexities associated with certain PDF features, Arkib Negara Malaysia will review PDF records containing special features on a case-by-case basis when the records are scheduled. Examples of special features include but are not limited to: digital signatures; links to other documents, files or sites; embedded files (including multimedia objects); form data; comments and/or annotations.

3.3 Requirements for Records Converted to PDF from Their Native Electronic Formats (e.g., office automation products)

3.3.1 Electronic records that have been converted to PDF from their native electronic formats must include embedded fonts to guarantee the visual reproduction of all text as created. All fonts embedded in PDF records must be publicly identified as legally embeddable (i.e., font license permits embedding) in a file for unlimited, universal viewing and printing.

    3.3.1.1 PDF records that reference fonts other than the "base 14 fonts"[16] must have those fonts referenced in the record (i.e., as a minimum, subsets of all referenced fonts) embedded within the PDF file.

    3.3.1.2 PDF records created after April 1, 2004, must have all fonts referenced in the record, including the "base 14 fonts," embedded within the PDF file. This requirement is met by having, as a minimum, subsets of all referenced fonts embedded within the PDF file.

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[16] The base 14 fonts are: Courier (Regular, Bold, Italic, and Bold Italic), Arial MT (Regular, Bold, Oblique, and Bold Oblique), Times New Roman PS MT (Roman, Bold, Italic, and Bold Italic), Symbol, and ZapfDingbats.

3.4 Requirements for Scanned Paper or Image Formats Converted to PDF

3.4.1 PDF records that contain embedded searchable text based on Optical Character Recognition (OCR) must be identical in content and appearance to the source document. Arkib Negara Malaysia understands that the ability to embed OCR'd text in PDF records enhances access to the records. While Arkib Negara Malaysia will accept PDF records with uncorrected OCR'd text, it will not accept PDF records resulting from OCR processes that either alter the content or degrade the quality of the original bit-mapped image.

> 3.4.1.1 Arkib Negara Malaysia will accept PDF records that have been OCR'd using processes that do not alter the original bit-mapped image. An example of an output process that accomplishes this requirement is *Searchable Image - Exact*.

> 3.4.1.2 Arkib Negara Malaysia will not accept PDF records that have been OCR'd using processes that substitute OCR'd text for the original scanned text within the bit-mapped image. Such OCR processes may involve loss of data through imprecise interpretation of scanned characters. Examples of output processes that use this prohibited technique include *Formatted Text and Graphics and PDF Normal*.

> 3.4.1.3 Arkib Negara Malaysia will not accept PDF records that have been OCR'd using processes that use lossy compression to reduce file size (e.g., JPEG). Such OCR processes degrade the quality of the original image and may make such images unsuitable for archival preservation. An example of an output process that uses this lossy compression technique for color and grayscale images is *Searchable Image - Compact*.

3.5 Transfer Documentation

3.5.1 For each transfer, agencies must supply documentation that identifies the software used to create the PDF records (if available) and the version(s), and the operating system (if available) and version(s).

3.5.2 Agencies must provide all external finding aids for the transferred PDF records (e.g., indexes; descriptive, administrative, or technical metadata; and/or databases of OCR'd text) in formats approved by Arkib Negara Malaysia, with the appropriate documentation.

3.5.3 When an agency has developed standards or guidelines to assist in formatting, validating, or accessing PDF records (including recommended software or quality settings, and/or guidelines for embedding metadata within PDF records), a copy of these standards or guidelines must be included with the transfer.

3.5.4 PDF records converted from scanned images also must adhere to the transfer documentation requirements in section 3.3 of the Scanned Images Transfer Guidance.

4.0 TRANSFER MECHANISMS

4.1 Agencies may transfer PDF records using media or methods approved by the Arkib Negara Malaysia.

4.2 PDF records must not be compressed (e.g., WinZip, PKZIP) or aggregated (e.g., TAR) for purposes of transfer unless Arkib Negara Malaysia has approved the transfer in compressed or aggregated form in advance. In such cases, Arkib Negara Malaysia may require the agency to provide the software to decompress the records.

5.0 LEVELS OF ACCESS

Arkib Negara Malaysia's ability to provide access to certain records will vary according to their hardware and software dependencies. At the present time, Arkib Negara Malaysia provides users with a copy of fully releasable electronic record files on any of the media currently approved by Arkib Negara Malaysia. For PDF records transferred to Arkib Negara Malaysia the user will be responsible for obtaining the necessary hardware and software to view the records.

Transfer Instructions for digital photographic records

1.0 PREFACE

This guidance expands currently acceptable formats to enable the transfer of permanent digital photographic records to Arkib Negara Malaysia. The specific requirements below build upon existing requirements for audiovisual records.

2.0 SCOPE

This guidance applies to digital photographic records that have been appraised and scheduled for permanent retention at Arkib Negara Malaysia. Included under the scope of this guidance are still photographs of natural, real-world scenes or subjects created in support of agency business that are:

- produced from digital cameras (excluding the types of records described below), and

- scanned images of photographic prints, slides, and negatives.

2.1.1 Inclusions

The guidance applies to master image files of digital photographs[17] created using medium to high quality resolution settings appropriate for continued preservation. Specific requirements and guidelines for medium quality image resolution are outlined in sections 5.3.3 and 5.3.4. High quality image resolution settings are described in sections 5.3.3.1 and 5.3.4.1.

2.1.2 Exclusions

The following digital photographic records will not be accepted for transfer under this guidance:

3.2.1   Low resolution photographs typically created for posting on agency web sites (i.e., all files created at less than 2 mega pixels,[18] or scanned as less than 2000 line files),

3.2.2   Digital photographs captured within office automation applications (e.g., word processing, spreadsheet, and presentation applications),

3.2.3   Digital photographic records such as aerial photography, and photogrammetric and satellite imagery,

3.2.4   Vector-based images, such as records created using graphic arts software or computer-aided design (CAD) applications.

4.0   EFFECTIVE DATES

The effective dates of these requirements are as follows and are based on when the records are created.

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[17] Hereafter the terms "photographs" and "digital photographic records" will be used to describe digital camera files and scans of photographic prints, slides, and negatives.
[18] Mega pixel is millions of pixels, which is a measurement calculated by multiplying the pixel array values for image width (in pixels) by image height (in pixels).

4.1   *November 12, 2003.* The requirements in this guidance (except those cited in 4.2 below) are effective November 12, 2003, for all permanent digital photographic records meeting the provisions of section 3.1.

4.2   *January 1, 2005.* The additional requirements in sections 5.3 and 5.4 (see below) apply to permanent digital photographic records created on or after January 1, 2005. The effective date of these provisions has been deferred to allow agencies time to implement them:

- Image resolution and size specifications for digital camera photographs (section 5.3.3.1)

- Image resolution and size specifications for scanned images of photographs (section 5.3.4.1)

- Restrictions against re-sizing or interpolating digital photographs (section 5.3.5)

- Compression level settings for JPEG files (section 5.3.7.1)

- Transfer of first generation JPEG files (section 5.3.8)

Additional technical metadata to be supplied with transferred records (section 5.4.4)

5.0   TRANSFER REQUIREMENTS FOR DIGITAL PHOTOGRAPHIC RECORDS

Effective upon promulgation of these requirements, Arkib Negara Malaysia will accept transfers of permanent digital photographic records that meet the specifications of this guidance. The requirements in sections 5.1 through 6.0 list acceptable image file formats, image quality specifications, transfer documentation, and related information on how to transfer these records to Arkib Negara Malaysia.

Arkib Negara Malaysia recognizes that legacy records and records whose disposition is changed from temporary to permanent may present unique circumstances for agencies. Any agency having permanent digital photographic records that do not meet the requirements in this guidance should contact the Arkib Negara Malaysia.

5.1   General Requirements

5.1.1   Digital photographic records acceptable for transfer to Arkib Negara Malaysia must meet the provisions of section 3.1 and shall include still photographs produced by digital cameras and scanned images of photographs.

5.1.2   Digital photographic records must be scheduled for permanent retention and transfer to Arkib Negara Malaysia. The records must be organized as either a discrete collection of photographs or by agency records series.

5.2   Image File Format

5.2.1   Arkib Negara Malaysia will accept digital photographic records in the following file formats and versions. Additional formats may be added in subsequent iterations of this guidance.

      5.2.1.1 **Tagged Image File Format (TIFF)**, in 'II' format,[19] versions 4.0 (April 1987), 5.0 (October 1988), and 6.0[20] (June 1992). Default file extensions include .TIFF and .TIF.

      5.2.1.2 **JPEG[21] File Interchange Format (JFIF, JPEG)**, all versions compliant with International Standards Organization (ISO/IEC) standard *10918-1: Information Technology—Digital Compression and Coding of Continuous-tone Still Images (1994)*. Default file extensions include .JPEG, .JFIF, and .JPG.

5.2.2   Arkib Negara Malaysia prefers that agencies transfer digital photographic records with file names that use the default file extension for each of the above formats. Records may be accepted that are named according to agency-specific naming conventions (e.g., agency acronym or Arkib Negara Malaysia -assigned record group number) provided the corresponding computer files can be opened and the agency has transferred to Arkib Negara Malaysia adequate documentation describing the file name and format of the files.

5.3   Image Quality Specifications

5.3.1   Records must be provided as continuous-tone gray scale or color raster images, 8-bit or 16-bit per channel.

5.3.2   Color images must be produced in RGB (Red Green Blue) color mode as 24-bit or 48-bit color files.

5.3.3   Records created using **digital cameras** must be captured as 2 mega pixel files or greater with a minimum pixel array[22] of 1,600 pixels by 1,200 pixels. (Note: image resolution for digital camera files will vary according to the settings of the digital camera and may affect actual pixel dimensions and aspect ratios[23]).

    5.3.3.1 Effective January 1, 2005, digital camera files must be captured as 6 mega

    pixel files or greater with a minimum pixel array of 3,000 pixels by 2,000 pixels.

    Records produced at this resolution and sizes are comparable in quality to 35-mm

    film photographs, which is the minimum quality level for still pictures currently

    accepted by Arkib Negara Malaysia.

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[19] In the 'II' format (i.e., *little-endian*), byte order is always from the least significant byte to the most significant byte.

[20] For records created after the effective date of this guidance, TIFF version 6.0 is recommended and preferred. Versions 4.0 and 5.0 are acceptable. The reference specifications for version 6.0 are defined at http://partners.adobe.com/asn/developer/pdfs/tn/TIFF6.pdf.

[21] The acronym JPEG stands for the Joint Photographic Experts Group, a standards committee formed in 1982 by the International Standards Organization (ISO) to research methods for electronically transmitting video, still images, and text.

[22] Height and width of an image in pixels.

[23] The proportion of an image's size given in terms of the horizontal dimension versus the vertical dimension.

5.3.4   Photographs must be **scanned** as minimum 2,000 line files[24] to approximate a 2 mega pixel file according to the following image size and resolution guidelines. (Note: image resolution for scanned images of photographs will vary according to the size of the source document, which may affect actual pixel dimensions and aspect ratios).

- Scan an 8" x 10" original (print, slide or negative) at 200 dpi[25] to produce a file that is 1,600 x 2,000 pixels.

- Scan a 4" x 5" original (print, slide or negative) at 400 dpi to produce a file that is 1,600 x 2,000 pixels.

- Scan a 35-mm original (print, slide or negative) at 1400 dpi to produce a file that is 1,300 x 2,000 pixels.

5.3.4.1 Photographs scanned after January 1, 2005, must be produced as minimum 3,000 line files[26] to approximate a 6 mega pixel file according to the following image size and resolution guidelines. Records conforming to these guidelines will be comparable in quality to 35-mm film photographs, which is the minimum quality level for still pictures currently accepted by Arkib Negara Malaysia.

- Scan an 8" x 10" original (print, slide or negative) at 300 dpi to produce a file that is 2,400 x 3,000 pixels.

- Scan a 4" x 5" original (print, slide or negative) at 600 dpi to produce a file that is 2,400 x 3,000 pixels.

- Scan a 35-mm original (print, slide or negative) at 2100 dpi to produce a file that is 2,000 x 3,000 pixels.

5.3.5   Effective January 1, 2005, agencies must ensure that digital cameras and scanners produce records with true optical resolution.[27] Resizing images or interpolating[28] to a higher resolution from a lower resolution for purposes of transfer will not be permitted.

5.3.6   Arkib Negara Malaysia will accept digital photographs in TIFF file formats that are compressed using a lossless[29] compression method (e.g., LZW, RLE). If available, Arkib Negara Malaysia prefers that agencies transfer uncompressed versions of these files.

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[24] 2000 line files describe digital photographs that are 2000 pixels across the long dimension of the image.

[25] DPI denotes dots per inch, a measure of the resolution of electronic images, which is the term most commonly used in available hardware and software, and is most widely recognized and understood by the community.

[26] 3000 line files describe digital photographs that are 3000 pixels across the long dimension of the image.

[27] True optical resolution is defined as the maximum or actual resolution of a device without recourse to interpolation. Interpolation (see note 12) that occurs as part of the normal operation of digital cameras is acceptable.

[28] The process of calculating greater or fewer pixels from existing pixels in order to resize an image as either larger or smaller.

[29] Lossless refers to a method of image compression where there is no loss in quality when the image is compressed or uncompressed.

5.3.7   Arkib Negara Malaysia will accept permanent digital photographs in the JPEG file format, which uses a lossy[30] compression method, provided the records have been created using at least medium quality[31] compression settings (or better).

>   5.3.7.1 Effective January 1, 2005, agencies must create JPEG files using at least high quality[32] compression settings (or better).

5.3.8   Effective January 1, 2005, agencies must transfer to Arkib Negara Malaysia first generation JPEG files that have not been degraded in quality by multiple revisions and re-saving. Making changes to JPEG files (e.g., altering the image size), and then re-saving them, can result in re-compression of the images, leading to additional data loss and degradation of image quality.

5.4   Transfer Documentation

5.4.1   For each transfer, agencies must provide information identifying the number of files in the transfer, the size (in bytes) of these files, and the logical arrangement of the files (e.g., by subject or date).

5.4.2   Agencies must provide *descriptive* information about the records (i.e., metadata).[33] Arkib Negara Malaysia prefers that this information be captured for each image in the image header, but will accept transfers of records with this information in the accompanying documentation. Specific information required includes, but is not limited to:

>   5.4.2.1 *Unique photograph identification number.* Identify each individual photograph with a unique identification number and/or file name. If agency-specific naming conventions are used, documentation must be provided describing these standards.

>   5.4.2.2 *Caption.* Provide narrative text describing each individual image in order to understand and retrieve it. Standard caption information typically includes the "who, what, when, where, why" about the photograph.

>   5.4.2.3 *Photographer.* Identify the full name (and rank, if military) and organization (agency, if Federal) of the photographer credited with the photograph, if available.

>   5.4.2.4 *Copyright.* Indicate for each image whether there is a restriction on the use of that image because of a copyright or other property rights. Agencies must provide, if applicable, the owner of the copyright and any conditions on the use of the photograph(s), such as starting and ending dates of the restriction.

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[30] Lossy refers to a method of image compression where some image content is sacrificed in exchange for higher compression ratios.

[31] While there is no standard or industry-recognized metric for determining medium quality, records created using this setting would reveal some degradation of the image without substantive loss of quality when viewed at normal size.

[32] While there is no standard or industry-recognized metric for determining high quality, records created using this setting would reveal no noticeable loss of quality or image degradation when viewed at normal size.

[33] Examples of descriptive metadata elements include Dublin Core and International Press Telecommunications Council (IPTC) metadata.

5.4.3   Agencies also must provide *technical* information about the records (i.e., metadata). Arkib Negara Malaysia prefers that this information be captured for each image in the image header, but will accept transfers of records with this information in the accompanying documentation. Specific information required includes, but is not limited to:

 5.4.3.1 *File format.* List the file format and version (if applicable) of each image file transferred to Arkib Negara Malaysia.

 5.4.3.2 *Bit depth.* Identify the bit depth of the transferred files according to the provisions of sections 5.3.1 and 5.3.2.

 5.4.3.3 *Image size.* Specify the image height and width of each image in pixels according to the provisions of sections 5.3.3 and 5.3.4.

5.4.4   For digital photographs created after January 1, 2005, agencies must supply the following additional technical information, preferably as part of each image's header. Agencies currently capturing this information must provide it with the above-cited documentation.

 5.4.4.1 *Image source.* Identify the original medium used to capture the images (i.e., the make and model of the digital camera or the make and type of the film used).

 5.4.4.2 *Compression.* Identify the file compression method used (if applicable) and the compression level (e.g., medium, high) selected for the image(s).

 5.4.4.3 *ICC/ICM profile.*[34] Provide custom or generic color profiles, if available, for the digital camera or scanner used [e.g., sRGB (standard Red Green Blue)].

 5.4.4.4 *EXIF information.*[35] If available, preserve and transfer to Arkib Negara Malaysia the Exchangeable Image File Format (EXIF) information embedded in the header of image files (as TIFF tags or JPEG markers) by certain digital cameras (e.g., make and model of the digital camera).

5.4.5   Agencies must provide all finding aids include database files, thumbnail indexes, shelf lists, caption cards, and other documentation necessary or helpful in properly identifying, retrieving, and using the records.

5.4.6   For scanned images of photographs, agencies must supply a description of the quality control inspection process, and a report on the results of the last inspection performed on the records and the date of that inspection. As part of the report, agencies should visually inspect a sample of the images for defects, evaluate the accuracy of finding aid data, verify file header information and file name integrity, and completeness of the images in the transfer.

 5.4.6.1 For inspections conducted after the effective date of this guidance, agencies must use quality sampling methods such as those presented in

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[34] The International Color Consortium (ICC) and Microsoft Windows Image Color Management (ICM) profiles define industry standard methods of generating and interpreting numeric values that describe color for digital screens, scanners, and output devices to ensure color consistency across platforms and devices.

[35] Detailed technical information on the EXIF standard can be found at http://www.exif.org.

ANSI/AIIM, *Sampling Procedures for Inspection by Attributes of Images in Electronic Image Management and Micrographic Systems* (ANSI/AIIM TR34-1996).[36]

6.0 TRANSFER MECHANISMS

6.1   Agencies may transfer digital photographic records using any of the approved media or methods listed in 36 CFR 1228.270(c).[37]

6.2   Digital photographic records must not be compressed (e.g., WinZip, PKZIP) or aggregated (e.g., TAR) for purposes of transfer unless Arkib Negara Malaysia has approved the transfer in compressed or aggregated form in advance. In such cases, Arkib Negara Malaysia may require the agency to provide the software to decompress the records.

7.0 LEVELS OF ACCESS

Arkib Negara Malaysia's ability to provide access to certain records will vary according to their hardware and software dependencies. At the present time, Arkib Negara Malaysia provides users with a copy of fully releasable electronic record files on any of the media currently approved by Arkib Negara Malaysia. For digital photographic records transferred to Arkib Negara Malaysia, the user will be responsible for obtaining the necessary hardware and software to view the records.

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[36] AIIM standards may be obtained from the Association of Information and Image Management, 1100 Wayne Avenue, Suite 1100, Silver Spring, MD 20910. The standards can be ordered online at http://www.aiim.org/.
[37] http://www.archives.gov/about_us/regulations/part_1228_I.html.

Transfer Instructions for digital geospatial data records

1.0 PREFACE

This guidance expands currently acceptable formats to enable the transfer of permanent digital geospatial data records created for Geographic Information Systems (GIS) to Arkib Negara Malaysia. The specific requirements below build upon the existing requirements for geospatial data records.

2.0 INTRODUCTION

Geospatial data records from GIS are a priority electronic records format identified by Arkib Negara Malaysia and partner agencies. A major goal of this initiative is to provide the tools for agencies to access electronic records for as long as required and to transfer permanent electronic records to Arkib Negara Malaysia for preservation and future use by government and citizens.

3.0 SCOPE

This guidance applies to digital geospatial data records (i.e., digital cartographic data files that may be processed in Geographic Information Systems) that have been appraised and scheduled for permanent retention at Arkib Negara Malaysia. Excluded are fixed views of the data and other types of reports and output products created as paper maps, other non-digital formats, or fixed digital formats such as GeoTIFF images. Arkib Negara Malaysia, in consultation with agencies, determines specific disposition instructions through the records scheduling process.

4.0 EFFECTIVE DATE

The requirements in this guidance are effective April 15, 2004.

Arkib Negara Malaysia recognizes there are active efforts underway to modify two applicable standards, SDTS and the Geography Markup Language (GML). Arkib Negara Malaysia may issue revised transfer instructions to incorporate revisions to applicable standards when appropriate.

5.0 TRANSFER REQUIREMENTS FOR DIGITAL GEOSPATIAL DATA RECORDS

Arkib Negara Malaysia understands that legacy records and records whose disposition is changed from temporary to permanent may present unique circumstances for agencies. Any agency having permanent digital geospatial data records that do not meet the requirements in this guidance should contact the Arkib Negara Malaysia appraisal archivist assigned to that agency (see section 7.0).

5.1 General Requirements

Those digital geospatial data records that are appraised as permanent must be scheduled for permanent retention and transfer to Arkib Negara Malaysia. The records must be organized as either a logical grouping of information or by agency records series.

5.2 Geospatial Data Standards

Arkib Negara Malaysia will accept digital geospatial data records that fully implement a non-proprietary, published, open standard maintained by or for a Federal, national or international standards organization[38]. Digital geospatial data records created and maintained in proprietary formats must be transferred to Arkib Negara Malaysia in an acceptable geospatial data standard. Examples of acceptable geospatial data standards include, but are not limited to:

5.2.1   Spatial Data Transfer Standard (Federal Information Processing Standard 173 and American National Standards Institute INCITS 320-1998). (*http://mcmcweb.er.usgs.gov/sdts/* and *http://www.fgdc.gov/standards/status/textstatus.html*).

5.2.2   Geography Markup Language, versions 2 and 3 (Open GIS Consortium). (*http://www.opengis.org/docs/02-023r4.pdf*).

5.3 Transfer Documentation

5.3.1   For each transfer, agencies must provide information identifying the standard and version to which the records adhere, the number of files in the transfer, the size (in bytes) of these files, and the logical arrangement of the files (e.g., by subject or date).

5.3.2   Agencies must provide descriptive and technical information about the records (i.e., metadata). This metadata should be incorporated into the appropriate section within the approved transfer standard used to transfer the digital geospatial data records to Arkib Negara Malaysia. The metadata must conform to a standard maintained by a Federal, national, or international body. For each transfer agencies must reference the standard(s) to which the data and metadata conform, including version and date, where applicable.

5.3.3   When metadata do not conform to a published standard, agencies must provide Arkib Negara Malaysia a full description of the standard and the metadata used. Where the standard is not maintained by a national or international body (i.e., agency specific), a copy and/or description of the standard must be included.

6.0 TRANSFER MECHANISMS

6.1   Agencies may transfer digital geospatial data records using any of the media or methods approved by the Arkib Negara Malaysia.

6.2   Digital geospatial data records must not be compressed (e.g., WinZip, PKZIP) or aggregated (e.g., TAR) for purposes of transfer unless Arkib Negara Malaysia has approved the transfer in compressed or aggregated form in advance. In such cases, Arkib Negara Malaysia may require the agency to provide the software to decompress the records.

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[38] Additional examples of open standards include the International Hydrographic Organization Transfer Standard for Digital Hydrographic Data (IHO 57), Spatial Data Standard for Facilities, Infrastructure and Environment (SDSFIE), and Military Standard: The Interface Standard for Vector Product Format (MIL-STD-2407).