ELECTRONIC RECORDS ARCHIVES

CONCEPT OF OPERATIONS (CONOPS v3.0)

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for the

NATIONAL ARCHIVES AND RECORDS ADMINISTRATION

ELECTRONIC RECORDS ARCHIVES PROGRAM MANAGEMENT OFFICE (NARA ERA PMO)

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CONCEPT OF OPERATIONS (CONOPS)

Signature Page

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CONCEPT OF OPERATIONS (CONOPS)

1.0 Scope

The Electronic Records Archives (ERA) *Concept of Operations (ConOps)* document describes the desired characteristics of the ERA system from the user's viewpoint. The sections below identify the proposed ERA system, provide a document overview and the approach used to generate the document, and provide a brief overview of the system.

1.1 Identification

The proposed ERA system will include all of the associated equipment, facilities, material, software, hardware, policy, technical documentation, services, and personnel required for operations and support at the National Archives and Records Administration (NARA).

1.2 Document Overview

The *ERA ConOps* document serves as a vehicle to communicate the high-level quantitative and qualitative system characteristics of the system to the user, buyer, developer, and other stakeholders. The ideas expressed in the *ERA ConOps* are the result of analyzing the challenges involved in the preservation of electronic records and the use of the OAIS model to efficiently address these challenges. The *ERA ConOps* should be reviewed jointly with the *ERA Requirements Document (RD)* as the ERA *RD* explores some information not presented here.

- **Section 1** describes the approach for developing the *ERA ConOps*.
- **Section 2** provides a list of reference documentation that was used in the creation of the document.
- **Section 3** describes the current NARA systems dealing with electronic records.
- **Section 4** discusses the justification for and nature of changes based on the most current information.
- **Section 5** of the document provides information on proposed system concepts.
- **Section 6** describes operational scenarios.
- **Section 7** summarizes operational, organizational, and other impacts during development.
- **Section 8** analyzes the proposed ERA system.
- **Section 9** provides additional information such as an acronym list that can be used to enhance readability and understanding of the document.

1.2.1 Approach

The initial approach taken by the ConOps Integrated Product Team (IPT) to develop this document was through the use of concept analysis, the process of analyzing a problem domain,

and an operational environment for the purpose of specifying the characteristics of a proposed system from the users' perspective. This method helped to clarify and resolve vague and conflicting needs, wants, and opinions by reconciling divergent views. Using this approach, the potential for designing a system in which each individual function meets its specifications, but the system as a whole fails to meet the users' needs, was minimized.

This version of the *ERA ConOps* document builds upon the framework established with the initial version, thus enhancing information previously presented, and has been updated to reflect the current state of the proposed ERA system. Information is being gathered through many means such as use case analysis, domain modeling, and a comprehensive Business Process Re-engineering (BPR) of the entire records lifecycle.

Information obtained from the ERA Program Management Office (PMO) Use Case (UC) Analysis project, and concept papers by members of the ERA PMO and ERA Program Office Support Team (POST), was used for the purposes of validating existing requirements, deriving additional requirements, and showing the interaction of users with the system. Additionally, the information gained enabled refinement of the user classes and operational scenarios.

As mentioned above, in order to incorporate ERA's approach to confronting the challenges of preserving electronic records into an integrated approach to the lifecycle management of all records, a reexamination of all of NARA's current business processes was required. The first phase of the Records Lifecycle BPR effort characterized the "as-is" NARA processes and created high-level "to-be" processes including new and redesigned processes for electronic and non-electronic records.

1.2.2 IEEE Standard

The *ERA ConOps* document was generated using guidance provided by the IEEE Std. 1362-1998, *IEEE Guide for Information Technology-System Definition-Concept of Operations (ConOps) Document*.

1.3 System Overview

The Archivist of the United States officially authorized the Electronic Records Archives (ERA) program under the National Archives and Records Administration (NARA) Directive 101-Part 3, Section 6, on October 31, 2002. The directives states:

> "Electronic Records Archives Program: Works with other offices to develop and initially deploy an Electronic Records Archives system that enables NARA to preserve and make accessible any type of electronic record in a format that frees it from the computer system in which is was created."

As a program, ERA is composed of the policies, procedures, practices, and the necessary technology that will enable NARA to build the ERA System to receive, preserve, and provide access to electronic records.

NARA believes that the management of records (electronic records and non-electronic) should be an integrated process that provides maximum efficiency and value for users. NARA has taken a lifecycle management of records approach to managing records during their lifecycle. This approach promotes more effective and efficient processes by sharing relevant data and seamless transition from one phase to another. The proposed ERA system should support NARA's end-to-end lifecycle management processes, including the creation of records schedules, transfer, and archival description, for all records, i.e., electronic and non-electronic.

In addition, the proposed ERA system will ingest, preserve, and provide access to electronic records of all three Branches of the U.S. Government and donated historical material in NARA's custody. The proposed ERA system is envisioned as a comprehensive, systematic, and dynamic means for preserving any kind of electronic record, free from dependence on specific hardware and/or software. The system should automate many of the electronic record lifecycle processes and make it easier to deliver electronic records in formats suited to customers' needs. The electronic records capabilities of the system will be used in NARA's Federal Record Centers as well as the National Archives and Presidential Libraries.

2.0 References

The standards, guidelines, and NARA and ERA PMO documentation used to develop the *ERA ConOps* are described in the sections that follow.

2.1 Standards and Guidelines

The standards and guidelines used in preparation of this document are listed below.

- Software Engineering Standards Committee of the IEEE Computer Society. *IEEE Std 1362-1998, IEEE Guide for Information Technology-System Definition-Concept of Operations (ConOps) Document*, March 19, 1998

- IEEE Std 610.12-1990, *IEEE Standard Glossary of Software Engineering Terminology*

- Consultative Committee for Space Data Systems, CCSDS-650.0-B-1, *Reference Model for an Open Archival Information System (OAIS),* January 2002

Note: The OAIS model was developed by the Consultative Committee for Space Data Systems (CCSDS) at the request of the International Organization for Standardization (ISO). ISO adopted and issued the CCSDS-650.0-B-1 based on the recommendation CCSDS, as ISO standard 14721:2003: *Space Data and Information Transfer Systems -- Open Archival Information System -- Reference Model* on February 24, 2003.

2.2 NARA Documentation

The following NARA documentation was used to support the generation of this document.

- Bellardo, Lewis. *Preserving Our Federal Heritage in the Digital Era: What is NARA's Role in Creating the Government's Digital Archives*, Presentation at Federal Library and Information Center Committee Forum on Preserving Electronic Records, March 27, 2001

- Cahoon, L. Reynolds, Testimony for the Oversight Hearing of the Subcommittee on Technology, Information Policy, Intergovernmental Relations and the Census of the Committee on Government Reform, U.S. House of Representatives, July 8, 2003

- Carlin, John, W., Testimony for the Oversight Hearing of the Subcommittee on Technology, Information Policy, Intergovernmental Relations and the Census of the Committee on Government Reform, U.S. House of Representatives, July 8, 2003

- ERA System Scope Mapped to Records Lifecycle BPR As-Is Process Model, March 27, 2003

- National Archives and Records Administration (NARA) Directive 101-Part 3, Section 6, October 31, 2002

- *NARA Enterprise Architecture (EA)*, Version 2.0, September 1, 2003

- National Archives and Records Administration, NARA Notice 2000-074, *Electronic Records Archives (ERA) Program*, January 19, 2000

- National Archives and Records Administration, *The Strategic Plan of the National Archives and Records Administration 1997-2008, Ready Access to Essential Evidence, Revised 2003*

2.3 ERA PMO Documentation

The following ERA PMO documentation was used to support the generation of this document.

- Analysis of Alternatives (AoA), Version 2.0
- Concept Of Operations (ConOps), Version 2.2
- Mission Needs Statement (MNS), Version 1.2
- Requirements Document (RD), Version 3.0
- Target Release Paper (TAR), Under Development
- Use Case Document (UCD), Version 1.0
- Vision Statement (VS), Version 1.0

3.0 Current NARA Situation

Currently, NARA's records lifecycle management processes and its preservation processes for electronic records are neither fully automated nor fully integrated. The electronic records accessioned by NARA over the past thirty years consist largely of data files and databases.

Scheduled future accessions of electronic records will require NARA to increase its current capabilities to address increased scope, diversity, and volume of records.

The content of the electronic records that will be accessioned reflects a broad spectrum of programs and activities of the Federal Government. Changing technologies support new and different types of data with enhanced formats (e.g., e-mail, geospatial data, digital imagery, office automation products, etc.). In addition, the rapid growth of the Internet is fueling increased public demand for improved on-line access to the electronic records held by NARA. Consequently, all of these factors motivate the need for a system that will adequately preserve electronic records for as long as they are needed, while providing access to them. The vision and mission of ERA is to meet these new requirements. Additional information can be found about these activities at the NARA website.

3.1 Background, Objectives, and Scope of the Current Situation

NARA's lifecycle management processes for Federal records include records scheduling, appraisal, transfer, destruction, description, and access review. These processes remain largely manual, with little information technology support beyond generic office automation. As part of the Records Lifecycle BPR, NARA has recently completed the first phase of a BPR of all its records lifecycle management processes.

NARA is not new to the preservation of electronic records. The agency has been accepting and preserving electronic records for more than thirty years. In that time, NARA has scheduled, appraised, accessioned, preserved, and provided access to electronic records created by the U.S. Congress, the courts, the Executive Office of the President, numerous Presidential Commissions, and nearly one hundred bureaus, departments and other components of Executive Branch agencies. NARA's current electronic records strategy calls for the storage of data in a software and hardware-independent format (typically fixed length or delimited files in a standard character set, such as ASCII), on a master and back-up copy of proven, commercially available storage media. Lack of automated capability also imposes narrow limits on access to these records.

For the past year NARA has been working with agencies through its Electronic Records Management (ERM) initiative to expand the data types that NARA will accept. The ERM initiative will provide the guidance that agencies will need to manage their records in electronic form, addressing specific areas of electronic records management where agencies are having major difficulties. This project will provide guidance on electronic records management, applicable Government-wide and will enable agencies to transfer electronic records to NARA in a variety of data types and formats so that they may be preserved for future use by the government and citizens. Additional information about the ERM initiative can be found at NARA website.

For the storage of the electronic records that have been accessioned, NARA adheres to prescribed environmental standards, performs annual statistical sampling to guard against any loss of data, and copies the records onto new media before any deterioration of the current media occurs. Historically, media refreshment has occurred on a ten year cycle. Through these

processes, NARA has had few problems related to digital storage media, but without automation its ability to accommodate expected growth in electronic records assets is severely limited.

These current NARA technical strategies for electronic records that support preservation, management, and sustained access are inadequate and inefficient. NARA expects to receive rapidly growing volumes of increasingly complex and varied electronic records in the future. The agency's systems are incapable of ingesting complex records in a variety of file formats and are unable to meet the challenges of varied and complex file formats that are expected in the future. These systems also have the following limitations:

- They are unable to accommodate expected exponential growth in the volume of records NARA expects to receive in the future,
- They provide very limited online access to electronic records, and
- They require labor-intensive review and redaction of records containing restricted information.

Currently, NARA has no systems which support services for electronic records in Federal Records Centers.

In order to meet NARA's strategic goals, the proposed system should be able to:

- Support NARA's records lifecycle management processes and continuing improvements with the efficiency, quality, effectiveness, and timeliness required by those processes;
- Provide access to descriptions of all types of records preserved by NARA;
- Accept/ingest electronic records in a variety of complex formats;
- Accommodate future digital formats;
- Accommodate open ended growth in the volumes of electronic records it receives, preserves, and delivers;
- Ensure the authenticity of the electronic records NARA preserves;
- Provide access to the electronic records; and
- Support flexible services for electronic records which NARA holds on behalf of other Federal agencies in its Federal Records Centers.

3.2 Operational Policies and Constraints

There are no other constraints beyond those mentioned in previous sections and in **Section 4.0, Justification for and Nature of Changes**. Limitations of a number of the systems that comprise the current environment are discussed in **Section 3.3, Description of the Current Environment**.

3.3 Description of the Current Environment

NARA's current environment consists of a number of independent systems that do not adequately fulfill its mission needs, comprehensively address the entire lifecycle management of records, and support all of NARA's evolving business processes. These stove pipe systems are incapable of scale, extensibility, and interoperability with other systems. Systems such as the

Archival Preservation System (APS) and Archival Electronic Records Inspection and Control (AERIC) allow NARA to preserve the bits that make up electronic records and verify the structure and content of only a limited number of types of electronic records. The Archives Document Review and Redaction System (ADRRES) and the Unclassified Redaction and Tracking System (URTS) will be instrumental in the access review process for electronic records and records converted to electronic form. Currently, the Archival Research Catalog (ARC) and Access to Archival Databases (AAD) systems are operational and available. ARC is an online catalog of NARA's nationwide archival assets of all types of records and provides search capabilities in order to retrieve descriptions of archival materials and digitized images of a small portion of these materials. AAD provides the capability for the public to search, view, and retrieve via the Internet, electronic records from a small number of the databases NARA preserves. A description for each of the independent systems, as excerpted from the *ERA Analysis of Alternatives (AoA),* is provided below.

3.3.1 Access to Archival Databases (AAD) System

Function: AAD is the first publicly accessible application developed under the auspices of the Electronic Records Archives (ERA) Program. The AAD System provides online access to electronic records that are highly structured, such as databases. The initial release of AAD contains over four hundred data base files from more than thirty series, which include well over fifty million unique records. These series were selected for AAD because their records identify specific persons, geographic areas, organizations, or dates, and so lend themselves well to this form of access. Some of these data files serve as indexes to other non-electronic records in NARA's assets. The AAD system does not, however, support quantitative or statistical analysis of data.

AAD provides users with the capability to search for and retrieve specific records from selected series and data files over the Internet. With AAD, users are able to select a series of electronic records, select a specific data file within a series, and are then provided with the capability to search for pertinent records by entering unique values, such as personal names, dates, cities, and states. AAD displays the records that match the search criteria entered by the user. Users may then view the records, print the records, or copy the records to their own computers and save them as electronic files. Because similar functionality is required by ERA, the decision has been made to subsume AAD functionality into ERA.

Current Limitations: There are no known limitations of the AAD system at this time.

3.3.2 Freedom of Information Act (FOIA) Processing and Redaction Systems

The current systems for processing FOIA requests and redaction of records are ADRRES and URTS. ADRRES is currently in use in the Special Access and FOIA Staff (NWCTF), and in the Initial Processing/Declassification Division (NWMD) in the National Archives and in the Ronald Reagan, George H. Bush, and William Clinton Presidential Libraries.

3.3.2.1 Archives Document Review and Redaction System (ADRRES)

Function: Among NARA's assets are many security classified and other access restricted records. For accessioned records, NARA conducts systematic review of these records and also responds to individual FOIA requests and requests made under the review provisions of the current Executive order on declassification and the Presidential Records Act.

For security classified records, ADRRES allows NARA to track systematic review and FOIA projects, manage the review workflow, scan paper records and redact the resulting digital images, track review decisions on individual documents over time, track correspondence with requesters, track appeal requests, and produce statistics and reports as needed (for example the Annual FOIA Report required by the Department of Justice). ADRRES meets Federal requirements for storing and processing records at the Top Secret (TS) level and below. Additionally, NARA deploys an ADRRES Sensitive Compartmented Information (SCI) system, which stands separately from the TS system, for maintaining records classified above the TS level.

ADRRES currently meets a number of high-level ERA requirements. Because of this strength and other strengths listed below, a decision has been made to subsume ADRRES functionality into ERA.

- Provides for review of electronic records for potentially restricted information by authorized personnel;
- Implements the results of electronic records review (release, redact, withdraw records);
- Provides the capability for appeal of review results;
- Provides workflow support for redaction actions; and
- Provides for redaction of electronic records.

Both ADRRES and URTS are based on HighView software. More Federal agencies use the HighView review and redaction products than any other similar product. NARA's eventual goal is to conduct records referral of equities for records under review from one agency to another electronically.

Current Limitations: ADRRES is a system that is currently used for digitized images of paper records. It is not concerned with issues of accessioning, description, preservation over time, or unmediated user access. ADRRES can accept certain kinds of electronic records at this time. Clinton Administration email messages from the Federal components of the Executive Office of the President are currently being loaded into ADRRES. Current security regulations do not allow unclassified electronic output from a classified system like ADRRES, so redacted images are printed to paper for delivery to requesters. Current security regulations also prevent ADRRES from interfacing with other systems.

3.3.2.2 Unclassified Redaction and Tracking System (URTS)

Function: ADRRES and URTS contain the same functionality. Both systems can receive either electronic records or scanned versions of paper documents for review and redaction. At this

time, URTS has more storage capacity than ADRRES. Plans are underway to increase ADRRES's storage capacity to be able to handle the Clinton electronic email messages. URTS will not produce electronic output until a protocol is accepted and approved. URTS contains information that is very sensitive although it is unclassified. Information subject to the statutory protection, such as grand jury information, income tax information, wiretap information, along with highly sensitive privacy and law enforcement information will be in URTS. These types of information must be protected from an inadvertent disclosure just as the classified information must be protected.

The initial scope of URTS is to provide electronic access to approximately thirty million electronic records (800 GB) from the email systems of the Ronald Reagan, George H. Bush, and Bill Clinton Presidential administrations, and the electronic records from the Kenneth Starr and Robert Ray Independent Counsel investigations. One of the general requirements of the system is that it provides the capability to import additional groups of records that were not specified in the original statement of work.

The URTS system as proposed meets the high-level requirements for review and redaction of certain types of electronic records. Because of this and other strengths listed below, a decision has been made to subsume URTS functionality into ERA.

- Provides for review of electronic records for potentially access restricted information by authorized personnel;
- Implements the results of electronic records review (release, redact, withdraw records);
- Provides the capability for appeal of review results;
- Provides for redaction of electronic records; and
- Provides workflow support for redaction actions.

Current Limitations: URTS is designed as a system for allowing review, redaction and release of digitized page images of records. It is not concerned with issues of accessioning, description, preservation over time, or unmediated user access. There has been discussion of loading fully released, unclassified electronic records from URTS into AAD. But there are many issues to work out regarding releasing redacted records to the public, and the challenges involved in releasing redacted records from a classified database are even greater.

3.3.3 Archival Electronic Records Inspection and Control (AERIC) System

Function: The system allows records processors to systematically check electronic data files by examining the electronic record layout. The system performs an automated check of electronic assets. It compares actual structure and content of electronic holdings received from Federal agencies to the technical specifications of those holdings as represented by agency provided documentation including record layouts, primary and foreign keys, and domain and range specifications. Also, AERIC maintains online metadata describing NARA's electronic assets. The metadata can be used to instantiate the databases, allowing searches for specific records in the databases; however, this search capability is not available to the public. AERIC can be used to create public use versions of restricted data files by replacing restricted data elements with dummy data. The decision has been made to subsume AERIC functionality into ERA.

Current limitations: Limitations of the AERIC system include the following items.

- Is available only to the staff of NWME;
- Is limited by file size - a maximum of 4 GB can be loaded in the system;
- The type of data determines the file size that can be verified;
- Is limited by the type of media that can be used with the system (3480 cartridges, CDs, floppy disks, and ftp files from client workstations);
- Standard loading of data is limited to two 3480 tape drives;
- Storage space is limited to the size of disks that are currently installed in the system (9GB disk to be upgraded to 18 GB disk);
- There is a time limit for how long a file can be retained on the server;
- File size uploaded and downloaded from the client workstation is limited to the NARA standard;
- The transfer rate of files loaded from client workstation to server is limited to NARA bandwidth requirements;
- Changes in the network or Oracle database server usually require changes to every client workstation;
- Can only verify structured or semi-structured data;
- Cannot verify several types of formats that can be preserved by APS. For example, variable length ASCII files that have ASCII counters created on 3480 magnetic tapes cannot be verified by AERIC;
- Metadata entered in AERIC is often limited to what is required for verification. In those cases, it is not adequate for instantiating databases for search and retrieval; and
- Data files accessioned before AERIC was implemented in 1993 are not covered by AERIC metadata.

3.3.4 Accessions Management Information System (AMIS)

Function: The Accessions Management Information System (AMIS) tracks electronic records accessions from the arrival of the records and/or their associated Standard Form (SF) 258, to the submission of the change of assets form, NA 14044. The system tracks the accessioning and initial processing of electronic records in NWME. Some of the processes AMIS supports are automated.

Current limitations: AMIS is available only to staff of NWME. The AMIS system is running on outmoded hardware. The AMIS tables and data were migrated to a Sun Ultra 450 platform as part of the migration, to make AERIC Year 2000 compliant, i.e., the AMIS tables are part of the old AERIC platform; however, the Year 2000 upgrade for AERIC did not include migrating the AMIS data entry screens. This meant that data entry had to be continued into the AMIS tables (that existed on the International Business Machines (IBM) AIX server.) The IBM AIX server is running at 62 MHZ. This is substantially slower than either the NARANET desktop environment or the Sun Ultra 450 environment currently used to run AERIC. The AMIS table space allocated on the IBM server is 104 MB. It currently occupies 110 MB on the Sun server. In FY1999, NWME analyzed the accessioning process and made changes, but the technical problems with the AMIS system were not completely addressed.

AMIS does not provide management with relevant information concerning the content of accessions and their associated files and the status of any processing activities concerning the accessions. A centralized tracking system for archival projects at the accession, media volume, and dataset levels is also lacking. Current efforts are underway to modify AMIS to implement the following functions:

- Determine the exact status of any accession and its files at any point in the accessioning process;
- Calculate the length of time it takes to process an accession and its files during any step in the accessioning process;
- Determine how many accessions and their files are being processed during any step in the accessioning process;
- Access and retrieve information concerning accessions with tape maps and dumps, as well as showing how long they have been pending;
- Retrieve information regarding when a Preservation 1 form was sent for technical processing, when the copies have been made; when they have been reviewed and arrived back to Archival Services Staff; and how long the accession(s) have been in the AERIC queue; and what accessions are currently in the AERIC queue; and
- Produce a variety of management reports regarding current and projected accessioning activities.

Future challenges exist for these systems. Since AMIS, APS, and AERIC are currently operating as separate entities, it is unknown what problems might be encountered if the different databases are linked. There are also potential problems related to scaling the system for high throughput processing of information needed during accessioning processing. Because of these challenges, the decision has been made to subsume AMIS, APS, and AERIC functionality into the proposed ERA system.

3.3.5 Archival Preservation System (APS)

Function: The core function of the APS is preservation processing of permanent, accessioned Federal electronic records. Currently scoped preservation processing for APS includes functions such as capture of metadata about recording characteristics, master/backup copy generation, master/backup association management, technical file specifications, tape location management, media recopy and media refresh scheduling, annual sampling for retrieval viability, and fulfilling reference requests. APS includes a database, the APS Catalog about physical files, and volumes of preserved electronic records. The system processes input files into a standard physical file output, verifying the identity of input and output copies. APS includes capabilities for input from a variety of legacy digital media, as well as through File Transfer Protocol (FTP). It can combine small input files into larger physical containers, in UNIX TAR format, for efficiency in storage and retrieval.

Current Limitations: The system was designed to preserve electronic records in a small number of formats based on standard character sets; typically ASCII and/or EBCDIC (reference Code of Federal Regulations (CFR) specifications). Processing formats other than these is not possible unless proper conversions are made prior to APS processing. Currently there is no automated

means of filing and retrieving the output tapes in appropriate physical locations. APS uses old tape drives, 9-track and 3480 class; therefore, newer tape drives will have to be integrated to preserve electronic records on denser magnetic media. No Digital Versatile Device (DVD) capability exists to input records created on DVDs. Also, client addresses (workstations Internet Protocols (IPs)) are hard coded into the application. APS is available only to staff of NWME.

Planned enhancements include migrating to a new operating system (i.e., Windows 2000 Pro, Windows XP, etc.), producing APS catalog reports, APS catalog database field modification, integrating catalog database information into office software documents, and developing fully automated annual sample processing and reporting. Other planned enhancements include:

- Maintaining a history file of deleted, modified, or 10-year re-copied information in the catalog database. This history file should not be linked to the production database;
- Providing the capability for APS to directly delete information in the catalog database;
- Creating a super user class of users that will provide selective access rights presently only available to system administrator;
- Detecting non-standard character within files (i.e., packed decimal, zoned decimal, etc.); and
- Adding features in the smart dump pull-down menus and shortcut menu keys.

Some challenges exist in order to make this system viable in the future, e.g., preservation standards and procedures would have to be determined for several types of formats and physical media. Software and hardware capability to preserve images, scanned images, portable document format, geographic systems, and web pages would have to be developed. The system's hardware would also have to be upgraded to achieve scalability of the system to process large volumes of e-records. Since this same activity is planned for the proposed ERA system, the decision has been made to subsume APS functionality into ERA.

3.3.6 Archival Research Catalog (ARC)

Function: The Archival Research Catalog (ARC) is the online catalog of NARA's nationwide assets in the National Archives in Washington and Regional facilities, and Presidential Libraries. It consists of two parts: ARC Web and the ARC Data Entry System. The ARC web system was rolled out to staff in May 2002 and the public in September 2002. The ARC Data Entry System was rolled out to a small number of Beta users in April 2002 and the agency-wide rollout began in July 2003.

ARC provides the capability to act as a discovery tool for both online and hardcopy records. The functionality provided by ARC can be defined in terms of the search service it provides, the ARC data model, and user interface. Invoking ARC, a user has the ability to search descriptions (in the catalog) for identification of potential desired records of interest. Search results include the return of Record Group, Set, series, file unit, and item level descriptions informing the user that records of interest pertaining to subject matter exist. ARC is also used by NARA staff to create descriptions of its records and of the people and organizations that created them. The ARC data entry system is a client-server Windows-based application. ARC is a third-party software application built on a relational database. ARC also contains links from item level

descriptions to digital copies of representative or significant archival materials from NARA's holdings. Currently there are over two hundred forty thousand digital object links in ARC descriptions. Some specific features in ARC include:

- Complete Archival Description. The archival descriptions themselves are treated as several separate records. The information describing the physical nature of the records are contained in separate physical occurrence and media occurrence records that are linked to the archival description.
- Archival Hierarchy. The parent/child links establish archival hierarchy amongst the archival descriptions.
- Creator Records. The links from the archival descriptions to the full organizational or person record.
- Access Points. The links from the archival description to the full access point record, e.g., topical subject, geographic reference.

ARC also employs complex authority file functionality and has several large databases/tables of authority records used in descriptions for basic and advanced searching of archival descriptions and archival creators. ARC also includes simple authority lists that aid in consistent data entry and retrieval. Because similar functionality is required by ERA, the decision has been made to subsume ARC functionality into ERA.

Current Limitations: Although links to digital copies of some of NARA's holdings exist in ARC, the vast majority of search results returned by ARC include only the descriptions of the archival materials and not an online access to the records themselves. In order to provide users with the capability to extend the search, i.e., provide users online access to the records of interest, linkage (to the records in the repository) will need to be provided.

3.4 Modes of Operation

The current mode of operation provides limited automation of processing and preserving electronic record accessions requiring human intervention at every step of the process. NARA's current environment is unable to cope with the current or anticipated future volume of records. For these reasons this section has been tailored out.

3.5 User Classes

User classes for the current situation and multiple independent systems identified above are the same as those addressed in **Section 5.5, User Classes and Others Involved**. Please refer to that section for detailed information.

3.6 Support Environment

The limited number of existing systems is individually supported by a mixture of in-house Government and contractor support from developers of the stove pipe systems. Each stove pipe system has its own unique support environment. For this reason this section has been tailored out.

4.0 Justification for and Nature of Changes

Over the last three decades, NARA has been successful in the area of preserving highly structured electronic records. Continuing growth in the volume, complexity, and diversity of records makes the current technical strategies that support preservation, management, and sustained access to electronic records both inadequate and inefficient. No standards exist for transferring many of the new types of records to NARA, and no mechanism exists for fully preserving and providing access to them once they are transferred. Current preservation processes are labor intensive; therefore, as record volume increases, resource utilization will also increase. Finally, for most types of electronic records, NARA cannot provide the access the public desires and deserves.

NARA's records lifecycle management includes many record processes that apply to all records, not just too electronic records. Presently, there is no comprehensive or coherent system supporting these processes. Because NARA's strategic plan calls for the development of a system that would provide this support, the need would be satisfied by including NARA's end-to-end records lifecycle management process as part of the ERA system.

4.1 Justification for Changes

Advances in technology have spawned diverse types of electronic records along with the capability to generate increased volumes of records quickly and efficiently. NARA is currently only able to fully manage fixed length or comma delimited electronic records. Given the speed of technological change, this is clearly inadequate to deal with the types and volumes of electronic records currently created by the Federal Government. Furthermore, the current method of processing files will not maintain the essential characteristics of all types of electronic records. The challenge, therefore, is to develop a new system that will preserve an increasing volume, variety, and complexity of types of electronic records.

Compounding the increase in electronic record complexity is the fact that the quantity of NARA's assets of accessioned Federal electronic records is increasing significantly. A decade ago NARA was accessioning only thousands of files a year. It is estimated that from 2005 through 2010, the projected accumulated volume of electronic records received by ERA will be eleven petabytes, increasing to an estimated accumulated volume of ninety-six petabytes by 2017. Additional information pertaining to the increase in volume is provided in the *ERA Requirements Document (RD)*.

NARA has undertaken a series of initiatives to improve its lifecycle management of the records of the U.S. Government. These include the Electronic Records Management (ERM) project in the President's E-Government initiatives, and NARA's Records Management Initiative (RMI), as well as the Electronic Records Archives. NARA's Records Lifecycle BPR will translate the results of these initiatives into an improved records lifecycle process. The development of a system capable of supporting the process is essential.

4.2 Description of Desired Changes

From an overall system perspective, the proposed ERA system should possess the following attributes.

- Infrastructure independence: an architecture that allows preservation of electronic records independent of any specific hardware and software that was used to produce them;
- Modularity: ability to use plug-in components that can be replaced with minimal impact to remaining components as workload and technology change;
- Scalability: capable of accommodating growth and managing differing sizes of repositories and ever increasing volumes of records;
- Extensibility: be able to handle additional kinds of electronic records over time, not limited to specific types of records that exist today;
- Comprehensiveness: provide support for lifecycle management processes for all types of records; and
- Flexibility: enable NARA to tailor electronic records services in its Federal Records Centers to suit its customers' needs and enable NARA to implement progressive improvements in its business process over time.

To meet strategic objectives, NARA must integrate its solution for preservation and long-term access to electronic records with the lifecycle management of those records throughout the Federal Government. To meet the challenges of today and the future, the proposed ERA system should provide the following capabilities.

- Capability to accept the transfer of records in a wide variety of complex formats as they were created or stored by their creators and the flexibility to easily adapt to future file formats;
- Capability to ingest, preserve, and provide access to electronic records;
- Capability to store records in a manner that is independent of any particular hardware and software component over long periods of time;
- Capability to scale in order to store and preserve records based on the predicted exponential growth in the volumes of records that are candidates for transfer to NARA;
- Capability to provide access to electronic records for all users based on established user rights and privileges to ensure that its users are able to access all of the electronic records that they are entitled to see;
- Capability to provide access to records in a manner that is consistent with current technology and the changing expectations of its diverse user communities;
- Capability to adapt to changing technology in order to continue to provide access to and delivery of information desired by the user community; and
- Capability to identify the essential characteristics of the records that are being preserved.

The proposed ERA system should provide the following capabilities in support of NARA records lifecycle processes.

- Provide end-to-end automated work processes that streamline the lifecycle management processes for all records;
- Manage the creation, review, and approval of records schedules and other disposition agreements;
- Support the transfer process of all records (electronic and non-electronic) to Federal Records Centers, Presidential Libraries, and the National Archives;
- Ensure that records schedules and other disposition agreements, which identify electronic records that are to be transferred to NARA, specify terms and conditions of such transfers which conform to NARA standards and requirements;
- Support end-to-end tracking of all records during the process of transfer, maintenance in Federal Records Centers, destruction or legal transfer to NARA, processing, preservation, and continuing use;
- Accept transfers of electronic records, check that these records conform to terms and conditions of a specified transfer, and store them in the system;
- Ensure that the electronic records transferred to NARA remain free from corruption and are accessible as NARA undergoes changes in information technology;
- Support the description of records held by NARA so that they are clearly identified, discoverable, and retrievable, and that applicable restrictions on access are specified;
- Dispose of stored temporary electronic records as stipulated by a records schedule or other disposition agreement;
- Enforce restrictions on access and release of electronic records;
- Segregate unrestricted content and/or redact content whose release is restricted, to enable release of unrestricted portions of a record;
- Provide access to electronic assets;
- Implement arrangements of electronic records;
- Output authentic copies of electronic records;
- Output copies of electronic records as specified by customers;
- Monitor system performance;
- Schedule reports;
- Interface with other systems;
- Maintain robust system security; and
- Provide audit trails of system activity.

4.3 Priorities Among Changes

The *ERA Target Release Paper (TAR)* contains information indicating the functionality by increment that the proposed ERA system is expected to satisfy. Please refer to the *ERA TAR* for this information.

4.4 Changes Considered But Not Included

Changes that were considered but are not currently envisioned as being handled by the proposed ERA system include:

- Tracking of physical locations of hardcopy records,

- Tracking of physical processing of hardcopy records, and
- Having the ERA system handle billing operations.

4.5 Assumptions and Constraints

This section identifies assumptions and constraints that may impact the system architecture or specific components of the proposed system.

4.5.1 Assumptions

The proposed ERA system relies on a set of assumptions that are derived from NARA's operational policies or are inherent in an Information Technology (IT) environment. In addition to the assumptions found in the *ERA RD*, the proposed ERA system should:

- Expect, that for the next several years, electronic records ingested into the system will be predominantly in legacy formats that are subject to rapid obsolescence and are neither self-describing nor conforming to open, non-proprietary standards;
- Be capable of outputting electronic records that satisfy NARA requirements for authenticity;
- Be capable of outputting preserved electronic records to target platforms for as long as the electronic records are retained;
- Be an integral component of NARA's lifecycle management of all records;
- Facilitate process improvements and service improvements both for processes executed using ERA and for external processes that intersect or overlap with ERA processes;
- Manage the NARA workflow for records lifecycle management processes, including scheduling, appraisal, description, transfer to NARA's physical custody, and transfer of legal custody of all records;
- Manage the NARA workflow for preservation and access for electronic records;
- Support processes for all electronic records from all classes of originators that NARA serves, including Federal and Presidential records, Congressional records, and donated historical materials;
- Serve all NARA components nationwide;
- Establish effective mechanisms to link ERA to records lifecycle management processes supported outside ERA;
- Handle temporary as well as permanent electronic records and have a systematic way to carry out the disposal of the temporary electronic records;
- Have transfers of electronic records to ERA for preservation conform to applicable NARA policy and procedures;
- Process, to the extent possible, all types of materials using templates;
- Manage the transfer of electronic records;
- Provide different levels of preservation and access to electronic records depending on agreements negotiated with customers and technical capabilities implemented in each increment of the ERA system;
- Systematically preserve electronic records' content, context, structure, and essential behaviors as defined by NARA and their originating entity;

- Provide the capability to recreate the arrangement of electronic records in the order established by their originators;
- Provide the capability to present records in the order established by their originators; and
- Expect that the volume, variety, and complexity of electronic records will continue to grow throughout the period of ERA development.

4.5.2 Constraints

Constraints that may impact the system architecture or specific components of the proposed system are provided in **Section 5.2**.

4.6 Adverse Effects

The risks of not proceeding with the development of ERA are many and include the following.

- NARA will not be able to achieve its mission if it does not build ERA;
- Electronic records that document citizens' rights, the actions for which officials are accountable, and the nation's history will all be lost without an effective system for ensuring both the preservation of and access to them;
- Public confidence would be shaken if NARA's ability to provide essential evidence of the rights of American citizens, the actions of federal officials, and the national experience is diminished;
- NARA's role would be increasingly reduced as the nation's record-keeper if it does not provide direction or cannot preserve electronic records created by the Federal Government;
- As the volume of electronic records increases, the backlog will grow and the ability to manage that backlog will diminish;
- Legal proceedings would be adversely affected if records required for fair and impartial review were not available; and
- The political landscape would change if Presidential electronic records were not available or other essential information documenting the workings of the government could not be retrieved.

5.0 Concepts for the Proposed System

The proposed ERA system has adopted the use of the Open Archival Information System (OAIS) reference model for an archival system dedicated to preserving and maintaining access to digital information over the long term. This standard was developed by Consultative Committee for Space Data Systems (CCSDS), with broad input from other communities. It was issued by the International Organization for Standardization (ISO) in 2003 as standard, ISO 14721:2003: *Space data and information transfer systems -- Open archival information system -- Reference model*. OAIS is a domain neutral reference model with characteristics broadly applicable to the management of any information over time. The archival community in general, and NARA in particular, contributed to the development of the reference model. While it needs to be refined to apply specifically to the domain of records, it provides a broad conceptual framework directly applicable to ERA. The OAIS model has been adapted and used by other archives in NARA's

research collaborations and provides the scalability, extensibility, and interoperability required for a system of this magnitude. This model does not prescribe an implementation.

NARA wishes to take advantage of the sound and proven IT and extensive research that has led to new technologies in order to preserve and provide sustained access to complex, diverse, and large volumes of electronic records that NARA must address both now and in the future. The lifecycle management of records requires an integrated, automated process from scheduling and appraisal through final disposition and public access. The increased volume and complexity of the electronic records reinforces the demand for this kind of management. Consequently, the *ConOps* described in this document stresses the urgency for a high-level of automation that will result in changes to the current approach to managing records in general and electronic records in particular.

ERA must be capable of addressing not only those records accessioned into NARA assets, but also those held temporarily in NARA's physical custody. The IPT which first developed the *ConOps* was directed by NARA to describe and document a system that meets all expressed NARA needs, rather than to significantly limit ERA capabilities at the conceptual stage.

Besides supporting full lifecycle management of all records, the proposed ERA system must be capable of addressing electronic records which have not been managed adequately prior to their transfer to NARA. Different characteristics and states of such records may limit NARA's processing, preservation and access services. NARA intends to handle such cases, as much as possible, within the context of pre-defined levels of service.

5.1 Background, Objectives, and Scope of the ERA System

Defining what is necessary to achieve NARA's strategic objectives for improving the lifecycle management of records of all types and the preservation of electronic records, began with vision development. NARA's leadership expressed its vision for the ERA system in a consensus *ERA Vision Statement (VS)*. Exploring alternatives and tradeoffs for such a system, the ERA AoA IPT recommended that ERA be an integrated system that provides OAIS foundation services (reference **Figure 5-1**, **Reference Model for and Open Archival Information System)** such as ingestion of electronic records; storage of electronic records for as long as needed; data management; and the ability to provide access to the records from anywhere on demand.

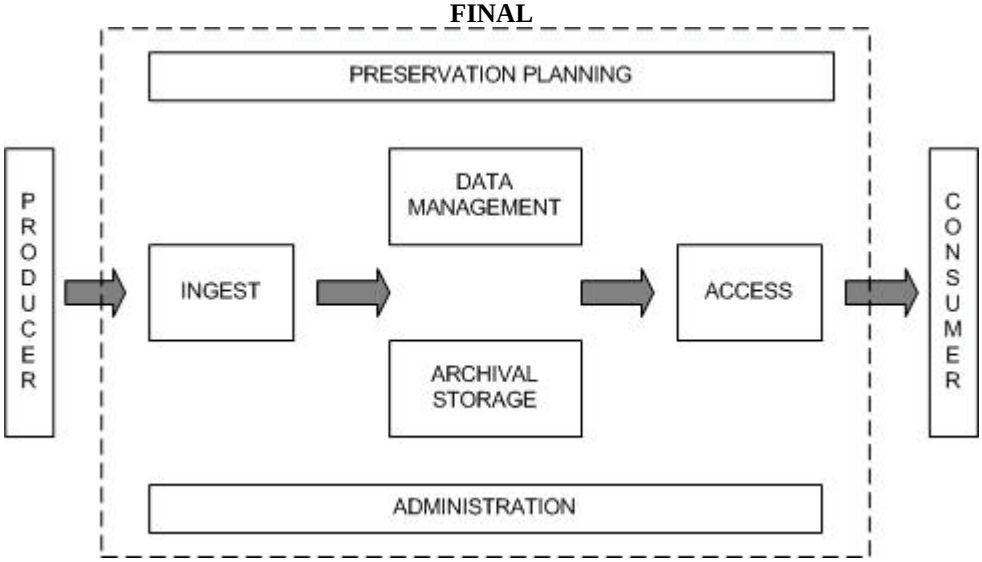

Figure 5-1: Reference Model for an Open Archival Information System

5.2 Operational Policies and Constraints

As excerpted from the *ERA RD*, conditions and constraints that may impact the proposed system architecture or specific components of the system include the following. The proposed ERA system should:

- Be implemented in a policy neutral manner (able to implement policies as identified by NARA throughout the system lifecycle);
- Comply with all applicable laws and regulations, notably:
  - The Federal Records Act and the Presidential Records Act;
  - Laws and regulations regarding IT security;
  - Laws and regulations regarding national security, freedom of information, privacy, and intellectual property; and
  - Section 508 of the Rehabilitation Act of 1973 (29 U.S.C. 794d);
- Be capable of providing different levels of service for electronic records depending on:
  - Preservation and Access Plans (for the records);
  - Agreements with Transferring Entities;
  - NARA's business strategies and priorities;
  - Laws and regulations requiring differential controls on access depending on both type of information and category of user; and
  - Technological characteristics of the records, including obsolescence, variations in data quality, and proprietary formats;
- In its design and implementation, be flexible and adaptable to changes in hardware, software, communication technology, archival processes, policy, personnel, and locations;
- Be designed in the context of NARA's Enterprise Architecture;
- Be accessed in accordance with the protocols described in NARA's Target Architecture;

- Store and process electronic records in environments appropriate to their stated sensitivity, and enforce access privileges and restrictions;
- Comply with NARA guidelines regarding access to records; and
- Provide public access to all electronic records assets, subject only to legal restrictions.

5.3 Description of the Proposed System

The ERA System described herein incorporates the information learned since the last version of the *ERA ConOps*. The updated information includes recommendations from other NARA reviewers on necessary and desired ERA characteristics, as well as those learned from on-going activities. Details on major components are presented in the **Section 6.0, Operational Scenarios**, in the form of operational scenarios.

5.4 Modes of Operation

The modes of operation for the proposed system as currently known are:

- Nominal,
- Degraded,
- Maintenance,
  - Remedial Maintenance,
  - Preventive Maintenance,
  - Code Upgrades, and
- Alternate site.

Nominal mode of operation describes the system when working at the optimum, i.e., the system is operational and working as intended.

Degraded mode and maintenance mode of operation describe operations in time when the system is working using a reduced string of operations. For example, the system is placed in a maintenance mode in order to perform a software upgrade. Once the software has been loaded, tested, and verified to work, the system is placed back in the nominal mode.

Alternate site mode of operation can be described as occurring when one site has a failure that requires a user to access records from an alternate site.

5.5 User Classes and Others Involved

A user can be defined as anyone who will interact with ERA. A user class is determined by the ways in which the user interacts with the system. The major user classes identified for the proposed ERA System include the:

- Transferring Entity - makes or receives records, prepares and transfers them to NARA. This class of users primarily consists of records creators, but the name was chosen to indicate the predominate interaction with the system;

- Appraiser - assesses the records with respect to informational value, artifactual value, evidential value, associational value, administrative value, and monetary value and recommends which records should be accessioned into NARA's assets and which should be disposed of by the Transferring Entity when no longer needed by the Transferring Entity;
- Records Processor – manages transfers of records, identifies arrangements and creates archival descriptions of records, carries out other processes needed to ensure the availability of records; and is responsible for the disposal of temporary records
- Preserver – plans the system approach for maintaining the authentic context, content, and structure of electronic records over time for viewing, use, and downloading. Concisely, the preserver plans processing activities that ensure ability to provide long-term access to electronic records through implementation of the Preservation and Access Plan;
- Access Reviewer - reviews security classified or otherwise potentially access restricted information in order to determine if the information can be made available to a consumer; facilitating redaction of potentially access restricted information in electronic records. The Access Reviewer reviews records in NARA custody and sets access restrictions;
- Consumer - uses the system to search for and access records, to submit FOIA requests, request assistance via mediated searches, communicate with NARA, and invoke system services;
- Administrative User - directly supports the overall operations and integrity of ERA and its use, and manages such system activities as user access rights, monitoring system performance, and scheduling reports; and
- NARA Manager – reviews system recommendations and makes decisions on when and how specific records lifecycle activities occur, and who will perform the work. The manager has ultimate responsibility for the completion of tasks and the quality of the products.

5.5.1 Capabilities

High-level ERA capabilities correspond to specific NARA tasks and the users' needs and desires for the proposed ERA system. These capabilities are organized according to user class but some capabilities cross user class boundaries and might be employed by users in more than one user class. User classes do not correspond to NARA position titles, nor does a user class correspond to a single individual user. Rather each user class describes a role that a user assumes in interacting with the system. An individual user may assume different roles to accomplish different purposes.

Transferring Entity

- ERA receives transfers of electronic records from the Transferring Entity
- ERA offers tools to assist the Transferring Entity in preparing records for transfer to ERA
- ERA provides the capability for the Transferring Entity to transact business with NARA related to the lifecycle management of all its records (both electronic and non-electronic). Such transactions include the scheduling of Federal records, the development of deposit agreements, the retirement and disposal of records in NARA's physical custody, the

transfer of records to the National Archives and Presidential Libraries, and the review, redaction, and release of records with information subject to legal restrictions on access
- ERA provides the capability for the Transferring Entity to control user access to electronic records in NARA's physical custody but that remain under their (i.e., the Transferring Entity's) legal custody
- ERA allows the Transferring Entity to search for templates, descriptions, records, and other records lifecycle data about records
- ERA allows the Transferring Entity to submit and register templates and other technical specifications that apply to their records
- ERA provides a reliable method of communication between the Transferring Entity and NARA
- ERA provides tools for the Transferring Entity to create and submit records schedules and other types of disposition agreements
- ERA supports returning a Transferring Entity's records back to the Transferring Entity

Appraiser

- ERA provides the capability for the appraiser to search for and retrieve existing disposition agreements, records schedules, deposit agreements, and appraisals
- ERA checks templates and other technical specifications for conformance to NARA requirements
- ERA accepts transfers of sample electronic records
- ERA facilitates the development, review, approval, and revision of disposition agreements

Records Processor

- ERA receives transfers of electronic records
- ERA checks transfers against specifications in disposition agreements
- ERA checks electronic records against applicable templates, schemas, and other technical specifications
- ERA facilitates taking legal custody of electronic records
- ERA facilitates identification of electronic records for national security, privacy, and other restricted information
- ERA facilitates review and checking of content and structure of electronic records
- ERA identifies relationships between digital objects, records, and sets of records
- ERA facilitates changes to relationships between electronic records
- ERA transforms electronic records to persistent formats
- ERA ensures integrity of data in transmission, storage, media migration, and technology refreshment
- ERA facilitates description of records
- ERA provides the capability to dispose of temporary records

Preserver

- ERA facilitates the creation/selection of a Preservation and Access Plan

- ERA facilitates the generation, registration, application, and management of templates for records and sets of records
- ERA supports testing and evaluation of options for preserving and providing access to electronic records
- ERA implements preservation plans for target classes, sets, and data types
- ERA checks preservation of electronic records
- ERA documents all preservation processes

Access Reviewer

- ERA supports systematic and ad hoc review of sets of electronic records for content that may be exempt from release
- ERA allows for review of specified electronic records in response to a request
- ERA facilitates coordination of access review issues with agency equity-holders outside NARA as necessary
- ERA indicates the access status of the record when the review is complete
- ERA facilitates redaction of potentially access restricted information in electronic records
- ERA provides for changes to access restriction status determinations and maintains and tracks the various versions

Consumer

- ERA supports searching archival descriptions, other assets, and electronic records using multiple criteria
- ERA provides searching capabilities against the content of electronic records
- ERA retrieves and presents electronic records
- ERA allows for mediated search requests
- ERA facilitates searching at multiple levels of aggregation
- ERA provides output options for electronic records including free and fee-based ordering of copies, extracts, and other derived products and services
- ERA receives FOIA requests
- ERA provides a communication mechanism between the consumer and ERA

Administrative User

- ERA enforces access control
- ERA registers users and creates user accounts
- ERA provides reporting capabilities
- ERA tracks use of ERA
- ERA tracks automated records and system processing
- ERA provides performance measurement capabilities
- ERA provides disaster recovery

NARA Manager

- ERA facilitates the review and approval of records descriptions

- ERA facilitates the assignment of tasks including:
  - Access review
  - Defining system workflow
  - Using on-line forms
  - Defining user interfaces
- ERA provides reporting capabilities
- ERA tracks workflow with respect to people, workload, and tasks
- ERA generates tracking, performance, and implementation reports concerning schedules, other disposition agreements, and appraisals
- ERA tracks access review work and produces reports regarding production

5.5.2 Interactions Among User Classes

The proposed ERA system described here is an overall conceptual workflow model that depicts where user classes should interact within the system and with each other. **Figure 5-2, ERA User Classes**, illustrates this conceptual model. The Administrative User and relevant capabilities are embedded in all components of the proposed ERA system.

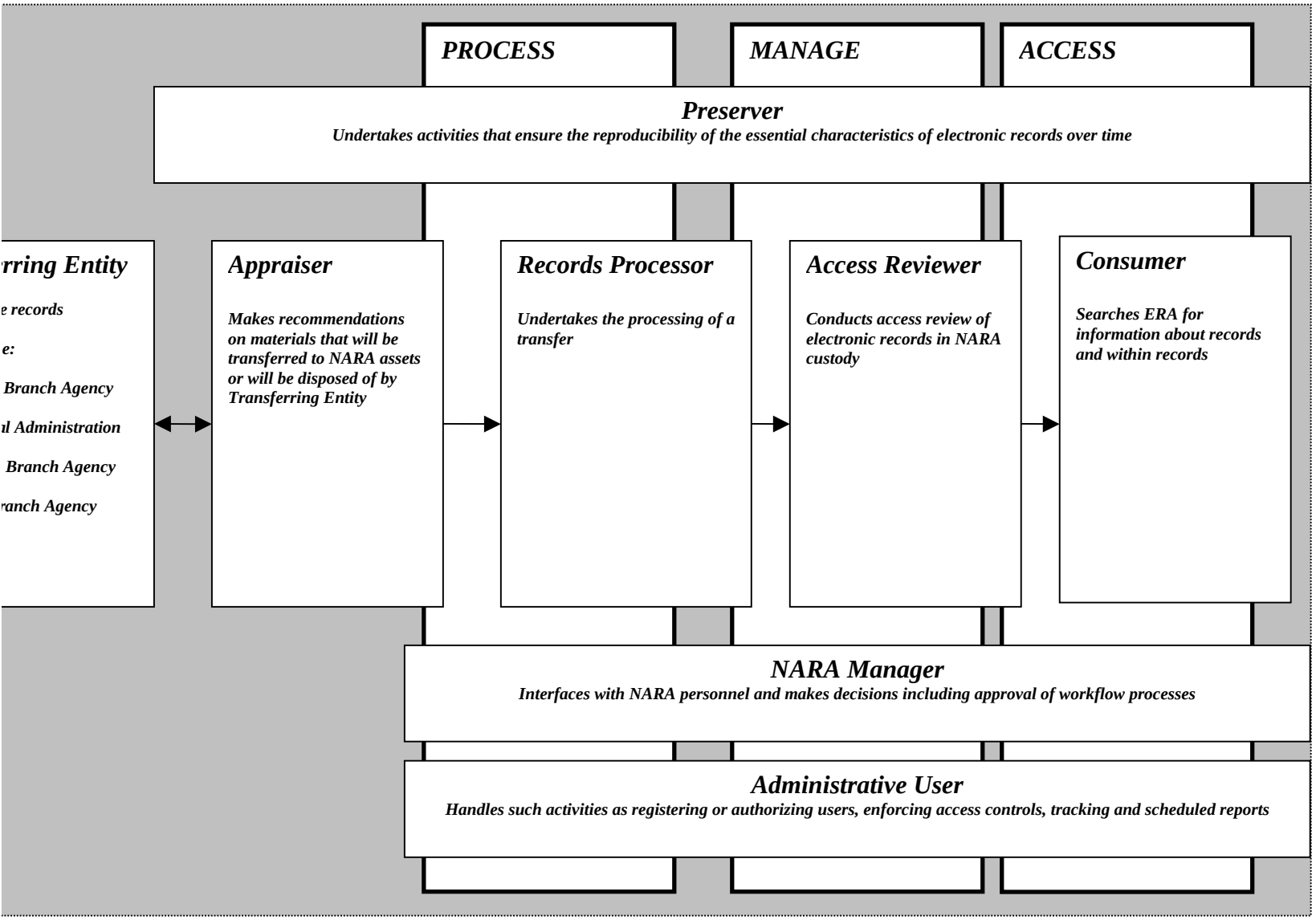

Figure 5-2: ERA User Classes

5.6 Support Environment

The support environment is currently not defined but will be provided in a future update to the *ERA ConOps.*

6.0 Operational Scenarios

The *ERA ConOps* document expresses what users want and envision in the proposed ERA System. Scenarios convey these needs in simple non-technical language. Overlap occurs between different scenarios as a result of interaction between different users or due to similarity between different activities. All of the scenarios represented in the following sections describe one example of how users may interact with the proposed ERA system. Scenarios have purposely been made to be far reaching in an attempt to include all possible actors within a designated class (of users) but the scenarios are not intended to identify all possible situations for any given user class. Additionally, the steps in the scenarios should not be interpreted as a fixed sequence of events, but instead as an illustration of capabilities the proposed ERA system will offer (any user class).

A scenario is a step-by-step description of how ERA should operate and interact with both its users and external interfaces under a given set of circumstances. Scenarios are described in a manner that enables readers to walk through them and gain an understanding of how all the principal parts of ERA function and interact. The scenarios tie together all parts of ERA, the users and other entities by describing how they interact. Scenarios cover the user's concept of all the operational modes and all classes of users identified for the proposed ERA System and illustrate all the business processes that ERA will support.

6.1 Transferring Entity Scenario

The scenario represents one example of how ERA will provide the following forms of support to the Transferring Entity when transferring records to NARA.

- Accept electronic records from the Transferring Entity regardless of electronic format or characteristics;
- Offer guidance and tools to assist the Transferring Entity in preparing records for transfer to ERA;
- Allow the Transferring Entity access to ERA in order to search for record templates that are needed, or to register and store such templates in ERA; and
- Manage the workflow process for the transfer of records.

NARA expects that ERA will rely on templates and related format standards to manage electronic records transferred to its physical custody, and especially to control and preserve electronic records accessioned into NARA's assets. In many cases, the level of control and preparation applied to the records will vary, depending on the value of the records and the resources of the Transferring Entity. In other cases, where the Transferring Entity no longer exists or does not have the resources to undertake the preparations necessary for transferring

records to ERA, NARA staff will serve as the Transferring Entity performing many user activities. The preservation and access level for a given record will vary depending upon factors including resources, record value, preservation planning decisions, technical limitations, and the record's conformance to a registered template. ERA will be able to provide a greater level of service for closely conforming records than for non-conforming records.

6.1.1 Transferring Entity

Transferring Entity users are creators, custodians, managers (e.g., records officers), and system managers or administrators who create, receive, maintain, or manage records. They interact with each other at various points in this scenario and with users defined in other scenarios in this document.

6.1.2 Transferring Entity Activities

1. Develop disposition agreements for records and templates that define their content, context, structure, and presentation.

   - The Transferring Entity (e.g., records managers, creators) develops disposition agreements (e.g., records schedules, deeds of gift, or deposit agreements) that include descriptions of sets of records, specific data about the records, and instructions on how long the Transferring Entity will keep the records, and what the Transferring Entity will do with the records when they are no longer needed for active use. The ERA system provides tools to create disposition agreements. Disposition agreements are assigned a unique identifier and will be stored in the ERA system.

   - The Transferring Entity (e.g., records managers, system administrators) defines templates for sets of records (e.g., case files, subject files) as well as for individual types of records (e.g., directives, memorandums), and registers them in ERA. The Transferring Entity accesses the ERA template repository to register/submit a new template; to create a new template based on a disposition agreement, electronic record, or model template; or to modify an existing template. ERA provides the capability for producers to search for existing templates or model templates.

   - When a disposition agreement specifies transfer of electronic records to NARA, the Transferring Entity must identify the template to be used in the transfer of records or develop templates with varying levels of detail appropriate to the records. For example, templates for temporary electronic records may be developed at a lesser level of detail than for permanent electronic records requiring long-term preservation. Also, in cases where it is not appropriate or even possible to develop unique templates, Transferring Entities may use a general, NARA-provided template to transfer records to NARA. The general template would allow the transfer of records in their original proprietary format with a minimum number of descriptive elements required by NARA for managing the records after they are transferred. However, regardless of whether the Transferring Entity or NARA develops the templates, NARA's ability to preserve and provide access to electronic assets depends on both the quality of the related templates and the accuracy

and effectiveness with which the characteristics of the records are captured. ERA will provide tools that assist personnel in the creation and management of the templates.

- ERA checks the templates created under this activity to ensure that they were created according to NARA standards and include all mandatory elements, i.e., ERA checks templates to ensure they contain all of the required functionality and that they are well formed. If the templates are rejected, ERA notifies the Transferring Entity, provides the results of the check, and requests correction. After ERA checks the templates, the disposition agreement must be approved by NARA before any records can be transferred to NARA or destroyed (see **Section 6.2.2** for approval of disposition agreements). The Transferring Entity (e.g., records managers) submits the disposition agreement and the templates to ERA using a reliable method of communication. Additionally, a Preservation and Access Plan needs to be defined by NARA with assistance from the records producer.

- Additionally, the Transferring Entity selects a mechanism for transferring electronic records to NARA, identifies any specific requirements it has for retrieving the records after transfer, and stipulates any restrictions on access to the records after transfer. These data form the initial basis for a Preservation and Access Plan for the records.

2. Place records under systematic control

- Creators and custodians in the role of Transferring Entity manage records to facilitate their active use and ensure they are retained for as long as needed.

- Using NARA guidance and tools offered by ERA, Transferring Entities identify the essential characteristics of the records that accurately represent their content, context, structure, and presentation. These characteristics are based on a core set of elements required by NARA for acceptance of a transfer of records but will also include characteristics that are unique to the domain in which the records are created. For certain records, the identification of these characteristics may be completed with less detail. Additionally, NARA staff acting as the Transferring Entity may identify such characteristics.

- The records are maintained in Transferring Entity-specific electronic systems (e.g., records management applications, electronic information systems) for as long as they are needed for active use. The Transferring Entity is responsible for tracking records in these systems.

- The Transferring Entity is responsible for determining if any changes in record keeping or business requirements, or information technology require a change in an approved disposition instruction.

NOTE: Refer to Section 6.2, Appraiser Scenario, for additional activities completed before records are transferred to NARA.

3. Transfer

- Using ERA, the Transferring Entity (e.g., custodians, system administrators) will initiate a request to transfer records. The ERA system will also associate the transfer with registered templates. Upon approval, electronic records are transferred to ERA in accordance to the disposition agreement or the proposed Preservation and Access Plan. For transfers of records that are denied because they do not conform, ERA will notify the Transferring Entity that additional information is required. In certain cases, ERA may still accept the records, although the ability to process them and service levels may differ.

  Note that ERA will provide the capability to manage the NARA workflow for the transfer of records from the Transferring Entity to NARA. ERA will be the single NARA portal for exchange of management information between records producers and NARA about transfers of all records (electronic and non-electronic). However, the ERA system will not be used to manage the actual transfer to NARA of non-electronic records. ERA will output relevant management information to other systems used for such transfers. The ERA system provides the capability to manage the request for transfer and store related information about the authorization to transfer, volume of transfer, and the timing of the transfer for all records.

- The Transferring Entity will send the electronic records, along with required supporting information, to ERA using a reliable method of communication. ERA will provide the capability to accept electronic records transferred via telecommunications or on acceptable digital media from the Transferring Entity according to the Preservation and Access Plan.

6.2 Appraiser Scenario

The following scenario outlines ERA's role in facilitating the interaction between the appraiser and the Transferring Entity throughout the process of scheduling and appraising records. As described in the example below, ERA will have the capability to check templates, streamline the review and approval process, generate reports, generate metrics, and provide a reliable method of communication between the Transferring Entity and NARA. Although this scenario presents a relatively high degree of NARA involvement with the Transferring Entity prior to transfer, it does not mean to suggest that ERA requires this level of interaction. In many instances, NARA will accept records for which there has been little or no preparation by the Transferring Entity prior to transfer. For example, in some instances, if the Transferring Entity no longer exists, NARA staff will assume the role (of the Transferring Entity) and use ERA to perform many of the Transferring Entity activities.

6.2.1 Appraiser

The appraiser works with Transferring Entities to develop disposition agreements, e.g., record schedules, deeds of gift, or deposit agreements. A disposition agreement identifies one or more

sets of records and defines one or more disposition instructions that apply to that set. Disposition instructions specify how long records are to be kept and whether they should be destroyed or accessioned into NARA's assets when they are no longer needed by the Transferring Entity. For electronic records that are to be transferred to NARA's physical custody, the appraiser works with the Transferring Entity to define the terms and conditions of transfer and to develop a Preservation and Access Plan which indicates how NARA will preserve and provide required access to the records. The amount of detail contained within the preservation and access plan will be dependent on the nature of the electronic records to be preserved. For each set of electronic records, the preservation and access plan identifies the essential properties of the set, and of any defined subsets within the set, that must be preserved. It also identifies the methods that will be applied to preserve those properties, and enables NARA to perform any required services for the set or the electronic records in it. Different preservation strategies and related levels of service will be defined for electronic records within ERA. Each preservation and access plan must specify one of these strategies. A preservation and access plan will be established whenever NARA agrees to accept the transfer of any set of electronic records. For Federal records, the appraiser reviews the records schedule proposed by the Transferring Entity, recommends whether or not the schedule should be approved, and negotiates changes to the schedule. For donated materials, the appraiser may develop templates, deeds of gift or deposit agreements, or gather other information about the materials.

6.2.2 Appraiser Activities

1. Review disposition agreement and related templates, and produce the Preservation and Access Plan.

- The Transferring Entity submits a proposed disposition agreement (e.g., records schedule, deed of gift, or deposit agreement) using ERA, along with any required supporting information. The appraiser may assist the Transferring Entity in developing the disposition and related information using collaborative tools provided by the system. ERA performs an initial review of the submitted agreement to check that all required information has been provided consistent with NARA standards and negotiates with the records producer the preservation and access level to be applied to their records, particularly for temporary records.

- In agreements which propose transfer of electronic records to NARA, either permanently as accessioned records or temporarily for storage, ERA checks the templates once they are submitted and registered in the ERA template repository, or for those templates that are identified by the Transferring Entity for the specific records that will be transferred. ERA checks the template for conformance to NARA's standards regarding the inclusion of core elements necessary to manage the records once they are received and to make sure the template is valid and well-formed. If the templates or disposition agreements are rejected as invalid, ERA notifies the Transferring Entity that the documentation is in error. Once the templates are checked by ERA, a disposition package comprised of the disposition agreement, any related information, templates, and their respective validation

reports is created by ERA. ERA notifies the appraiser that the disposition package is stored in ERA pending review.

- The appraiser accesses ERA to review the disposition package. The appraiser determines whether the disposition agreement and templates are adequate. Also, the appraiser reviews the validation report for errors or inconsistencies. Based on the types of records, record sets, and digital formats of records that are proposed for transfer, the appraiser determines if there are NARA standard methods which would enable transfer, preservation, and access to the records. If so, the appraiser specifies these methods in the Preservation and Access Plan. In any case where there is no applicable standard method, the appraiser contacts a preserver to identify an appropriate method.

2. Review and appraise records and approve disposition agreement.

- After the appraiser determines that the disposition package is adequate (i.e., compliant with applicable policy and procedures), the appraiser may contact the Transferring Entity in order to examine the records identified in the disposition agreement. The appraiser may either request that the Transferring Entity transfer sample records to ERA or the appraiser may review the records in agency systems. In some cases, review of the records may not be required, or even possible.

- After reviewing the disposition package and records, the appraiser evaluates whether the documentation provided in the package is acceptable and whether the disposition instructions specified in the agreement are appropriate for the records. This evaluation is documented in the appraisal report, which is added to the disposition package. When the disposition package is ready for approval, ERA manages the review process by tracking the status of the package and routing it through NARA managers to the Archivist of the United States for approval.

- Throughout the review process, ERA will maintain an event log. Using the event log, statistics, performance, and metrics data can be extracted in the form of reports that can be reviewed by the appraiser and reported to management.

3. Notify Transferring Entity of the disposition package status.

- After the disposition package is approved, it is available for dissemination and implementation. ERA provides the appraiser with a means to notify the Transferring Entity of the approval or rejection of the disposition package, as well as to report on the status of the disposition package in the approval process. ERA preserves evidence of the approval, along with proof of notification to the Transferring Entity, as part of the final disposition package.

6.3 Records Processor Scenario

This scenario presents an example of how a records processor might use ERA to receive a transfer, accession the records in the transfers, and process electronic records. The duties of the records processor include accessioning and processing functions that are currently allocated to various NARA staff roles. The scenario is broad enough to include all types of Transferring Entities, as well as all types of records that they might transfer. However, this example is not intended to account for all possible situations in this user class. The steps listed below should not be necessarily interpreted as a sequence of events. While Steps 1-4 under **Section 6.3.2** must be completed first, steps 5-7 could conceivably be performed in different order, or simultaneously, or a step could be performed in segments over time. In cases where the Transferring Entity no longer exists, NARA staff will serve as the Transferring Entity.

6.3.1 Records Processor

The records processor is engaged in administering the accessioning, verification, arrangement, and description of electronic records. The records processor interacts with Transferring Entities and with other NARA staff roles at various points in this scenario. The records processor user class may include a variety of users who specialize in some aspect of the activities described below. For example, a records processor can be a specialist who works with Transferring Entities and appraisers to develop the necessary templates and strategies for transfer and processing of records, i.e., the Preservation and Access Plan. The records processor can also be a specialist who performs verification of records upon their transfer.

Appropriate NARA staff members are responsible for specific activities – such as declassification review and accessioning approval – associated with the records processor's duties.

6.3.2 Records Processor Activities

1. Transfer

- The Transferring Entity uses ERA to submit a request to transfer electronic records to NARA.

- ERA evaluates the request against the disposition agreement and related Preservation and Access Plan (if the request includes electronic records) and provides authorization for the Transferring Entity to send the records, or informs the Transferring Entity that the request for transfer has been denied until discrepancies are corrected and ERA provides permission.

- The Transferring Entity sends the records. For electronic records, this means sending the digital files containing the records to ERA which may be done electronically or via media.

- ERA stores electronic records transfers in a manner consistent with their stated level of security. For both electronic and non-electronic records, ERA confirms receipt of the transfer and notifies appropriate NARA staff and the Transferring Entity of the arrival of the transfer.

- The records processor uses ERA to check that transfers of electronic records between the Transferring Entity and ERA are successful, i.e., checks that all the appropriate components of the transfer are included and that they are complete and uncorrupted. ERA produces reports of any problems or discrepancies and notifies the records processor and Transferring Entity. When the Transferring Entity has transferred any missing, incomplete, or corrupted components, or has replaced such items, ERA notifies the records processor.

2. Verification and Initial Security Review of Electronic Records

- The records processor invokes a preliminary screening of the records to identify or check for the presence of potentially access restricted content in a transfer. ERA scans the transferred records for indications of potentially access restricted content and reports the results to the records processor. The system will segregate potentially access restricted content for further review.

- ERA checks the transferred electronic records against the specifications in the disposition agreement, transfer authorization, Preservation and Access Plan, templates and other documentation. ERA produces a report showing the results of the verification, and includes the report in the accession package.

- If the ERA verification report indicates a discrepancy, the records processor is alerted. The records processor determines whether to add a note to the documentation of the records or in the description, describing the discrepancy in the data. If necessary, the records processor may also notify the Transferring Entity and request that the Transferring Entity take corrective action.

- The records processor uses ERA to indicate successful completion of verification of the records.

3. Preservation

- ERA checks that the methods stipulated in the Preservation and Access Plan for preserving records, instantiating the original order of the records and producing authentic copies can be applied successfully to the records in the transfer.

- If the Preservation and Access Plan requires any preservation actions, such as reformatting data types or records types, i.e., transformations, ERA stores the records as they were received, then performs the preservation actions, generating a second version of the records.

- The system carries out the instructions in the Preservation and Access Plan and generates a report on preservation verification and actions, identifying any problems encountered.

- The records processor reviews the preservation report and may decide to invoke tests to check that the records remain authentic. The records processor may consult with a preserver about any problems in the preservation report or test results.

4. Arrangement

- The records processor uses ERA to determine the arrangement of electronic records in the transfer, and to check that ERA can instantiate this arrangement. NARA is primarily concerned with the arrangement expressed in the "original order" of records; that is, the order imposed by the records producer to facilitate their use in its activities. Traditionally, records have been arranged according to a hierarchical files classification system, but electronic records may also be arranged according to a data model, in layers of a Geographic Information System, or empirically on a web site. In any case, ERA must maintain the specification of the arrangement and must be able to present the records in the specified arrangement. ERA will store the specification for an arrangement in a template.

- The records processor determines whether a template specifying the original order of the records exists in ERA. If so, the records processor invokes tests to confirm that ERA can present the records in the arrangement specified. If not, or if the records processor determines the template is inappropriate, the records processor may define a new arrangement for the records. ERA transmits any proposed new arrangement to appropriate NARA managers for authorization. Upon approval, ERA stores the arrangement template as an approved arrangement for the specified records set.

- The ERA system will provide the capability to support multiple arrangements and manage versions of arrangements. Hierarchical levels of arrangement may be specified in a single template. But the system must also be able to link arrangement templates, so that, for example, a single template applies to a series which exists over long periods of time, but parallel, lower level templates reflect successive changes in the internal structure of the series.

- The records processor may use ERA to define relationships between or among records or records sets, in addition to the relationships stipulated in an arrangement. For example, the records processor may indicate that the same document is a record in two or more different file units or series. This occurs when many records in a case file of an agency line operation may be duplicated in the files of subsequent investigation and adjudication or legislation related to the case.

5. Transfer of Legal Custody (Accessioning)

- ERA assembles the information relating to the records to be accessioned, including transfer documentation, the description of the records transferred, correspondence between the records processor and the Transferring Entity, and any other relevant information. A records processor uses ERA to complete and submit the appropriate document to transfer legal custody.

- ERA notifies appropriate NARA staff that the accession is ready for approval. Designated NARA staff review the accession information, the records on as needed basis, and approve the transfer of legal custody. When the transfer of legal custody is approved, ERA indicates that the accession has been accepted into NARA's assets and notifies the Transferring Entity.

6. Archival Description

- The records processor uses ERA to create or enhance the description of the records. For electronic records, ERA parses the transfer documentation, the electronic records, and reports generated in processing the records, extracting pertinent information that will be used to populate description fields. For non-electronic records, ERA parses all existing documentation it contains about the records, such as the disposition agreement and the transfer documentation, extracting information and using it to populate description fields. Any required fields not populated by ERA will be completed by the records processor. The records processor then reviews the description populated by ERA, and modifies it as necessary. Note that the records processor does have options available for creating the description by entering all information manually or by copying and modifying an existing description. When the records processor indicates the draft description is complete, ERA checks the draft description against NARA rules for archival description, and notifies the records processor of any problems. ERA will manage descriptions and provide maintenance of multiple versions (of descriptions).

- The records processor submits the completed draft description for review. Draft descriptions, whether created anew or modified from existing descriptions, are required to undergo the review process. ERA manages the workflow of the review. Draft descriptions are reviewed and approved by the NARA Manager.

7. Conclusion of Processing

- ERA notifies the records processor that the processing for the accession is complete.

- Electronic records and their associated templates and descriptions are stored in ERA. Descriptions of non-electronic records are also stored in ERA.

- ERA notifies consumers who have entered subscriptions asking to be informed when records of the type processed are available for access.

6.4 Preserver Scenario

The Preserver scenario illustrates the activities undertaken to ensure the reproducibility of the essential characteristics of electronic records over time. This scenario pertains only to electronic records. Preservation includes all activities necessary to ensure that digital files remain intact in transfer and storage; that an electronic record can be reproduced from its digital components and presented in authentic record form; that the original order, and any other arrangement of records approved by NARA, can be implemented; that changes in the formats of digital components of electronic records or in the methods applied to reproduce a record or instantiate an arrangement retain required attributes and methods; and that NARA can certify the authenticity of reproductions of electronic records. Preservation is not limited to permanent electronic records, but applies to any case where electronic records need to be retained for a length of time that entails significant risk to the continued existence, accessibility or authenticity of the records. Preservation activities include:

- Creating/defining a Preservation and Access Plan for each set of electronic records that will be preserved in ERA for any length of time. A Preservation and Access Plan identifies the NARA standard preservation methods and the chosen preservation strategy which will be applied to the records, the related levels of service, and the parameters or conditions for their application, including:

  - Terms and conditions for transfer of electronic records to ERA,
  - Standard templates and rules defining the essential attributes and methods of any sets of records which must be preserved, i.e., disposition agreement,
  - Standard methods for reproducing electronic records from their digital components,
  - Conditions and standard methods for changing the formats of digital components of records when required for preservation and continuing access,
  - Essential properties of the set and of any defined subsets within the set that must be preserved,
  - Methods that will be applied to instantiate the structure (arrangement) of a set, to locate records within that structure, and to enable browsing and retrieval of the arranged records,

- Managing templates that articulate the characteristics that must be preserved

- Ensuring continuing access to the electronic records over time

- Independently evaluating how well the system satisfies the Preservation and Access Plan requirements

- Approving system changes, such as in storage media, that might impact the preservation of electronic records.

6.4.1 Preserver

The preserver is a specialized class of NARA staff who combines professional knowledge and skills in archives, records management, and information technology. The preserver has direct responsibility for ensuring that the technological capabilities and methods implemented in the system satisfy NARA's business requirements and rules for the lifecycle management of electronic records. The preserver works closely with the records processor, appraiser, and NARA consumers to ensure that electronic records are properly preserved and that the system can produce authentic copies of them.

6.4.2 Preserver Activities

Preservation processes will include the monitoring of storage to ensure data remains intact and, as needed, to take corrective actions, the evaluation of methods for preserving and providing access to authentic electronic records in defined arrangements, generation, registration, and validation of Preservation and Access Plans, templates, and other controls, and the execution of processes designed to overcome format obsolescence. The preserver has the capability to provide pre-transfer support to Transferring Entities, appraisers, and records processors. The preserver analyzes information about current and expected transfers of records and uses ERA to create generic templates for types of records and sets of records. The preserver stores these templates in the ERA template repository for use by Transferring Entities and appraisers.

1. Preservation and Access Plans

- Any set of electronic records to be transferred to NARA's physical or legal custody, under a records schedule or other disposition agreement, must have an associated Preservation and Access Plan which specifies how NARA will provide the storage, access, reproduction, or other services required by the disposition agreement. Each plan adopts NARA standards for such services for the classes of records and types of data included in the body of records. The preserver articulates the preservation standards which guide appraisers in negotiating with the Transferring Entity to formulate preservation plans for records that are to be transferred to NARA.

- The preserver guides Transferring Entities and appraisers in determining which standard preservation methods and registered templates apply to specific records and sets of electronic records, and assists in the process of developing and registering specific templates. The preserver evaluates preservation plans to ensure that specific terms and conditions for transfers to ERA are feasible and appropriate, that methods identified in

the plan for preserving, reproducing, and providing access to electronic records are appropriate and effective, and that assigned templates will enable required archival control.

- The preserver works with administrative users to ensure that ERA can implement standard preservation methods and check transfers against these terms and conditions.

- The preserver identifies characteristics of electronic records that cannot be accessioned, preserved, or accessed using existing tools or templates, and determines if they could be accommodated by modifications or extensions to existing tools or templates, or by creation of new templates. The preserver uses ERA to develop new templates and stores them in the ERA template repository. If new or different preservation methods are required, the preserver formulates and submits a change request.

2. Template Coordination

- A template expresses one or more requirements for the lifecycle management of records in a manner which enables systematic control over the lifecycle and facilitates automated execution of lifecycle management processes. The preserver reviews any template proposed by an appraiser as a NARA standard or model in order to ensure that records lifecycle controls stipulated in the templates can be implemented in the system. The preserver specifies criteria which will be used by the system to check lower level templates for conformance to a NARA standard or model template.

- The preserver reviews proposed templates, and validation reports about these templates, to ensure that records lifecycle controls stipulated in the templates can be implemented in the system. The preserver works with records producers and appraisers to resolve any problems related to the conformance of a proposed template with NARA standards for templates.

3. Processing Electronic Records

- The preserver links business rules related to lifecycle management of sets of records to be transferred to ERA with methods which will be applied to check conformance of the records with these rules when they are transferred. The preserver defines reports to be produced from such verifications and specifies threshold parameters for acceptance or rejection of deviations from the rules.

- The preserver uses ERA to review transfers of records and the changes applied to them to determine if preservation objectives are being achieved effectively and consistently.

- When problems occur in executing a preservation plan, the preserver determines whether the exceptions should be accepted and documented “as is.” Alternatively, the preserver works with the records processor to determine appropriate corrective action or to modify

the Preservation and Access Plan. If that alternative fails, the preserver evaluates and recommends new or revised preservation standards.

- In response to a consumer request which cannot be satisfied using standard options, the preserver uses ERA tools to output copies of electronic records, or their digital components, in formats that can be accessed on the consumer's system.

- The preserver ensures that ERA captures and retains information about electronic records necessary to ensure their preservation, accessibility, and to certify their authenticity. The key preservation process required for all electronic records is the ability to produce authentic copies of the records from stored data. ERA will provide appropriate tools, techniques, and methods to enable output of authentic copies of any electronic records in the system for as long as they need to be maintained, which will range from a few years to effectively forever.

- The preserver defines requirements for an audit trail of all transformations performed in ERA in order to document the relationship between the records acquired from the Transferring Entity and their transformed versions, and defines reporting requirements for other system functions and parameters related to preservation. The preserver reviews the audit trails and reports to evaluate system performance against preservation requirements.

- The preserver works with Transferring Entities, as needed, on implementation of disposition agreements to transfer electronic records from the producers' systems to ERA.

4. Maintenance of Electronic Records

- The preserver uses ERA to examine samples of electronic records being preserved to ensure that nothing is lost or corrupted in storage. ERA will provide the capability to monitor raw bit error rate and corrected bit error rate of storage media in archive. ERA will also provide safeguards to monitor media degradation, migrate records to new media, and provide the necessary tools for recovery of electronic records from failed media.

- The preserver works with administrative users to ensure that necessary changes, such as media migration, are implemented in the storage system. The preserver reviews plans for, monitors, and evaluates updates or modifications of the storage system, including migration of preserved electronic records to new digital media.

- The preserver identifies opportunities for improving preservation quality or service and uses ERA to perform such changes.

6.5 Access Reviewer Scenario

As proposed, the ERA system will store and maintain records that NARA receives containing information subject to restrictions on access. Information may be restricted for a variety of

reasons including national security classification, privacy, intellectual property, and other provisions of Federal law, as well as stipulations in deeds of gift and deposit agreements. Storage and access to such information must conform to the laws, regulations, and policies governing such information. NARA needs to review records to ensure that restricted information is properly characterized, to determine if such information may be released to a consumer, and to produce disclosure-free versions. Appropriately cleared access review staff will be able to begin the review process at any point after transfer, but this step will generally begin after legal custody of the records has been transferred, i.e., accessioning.

ERA will assist the access reviewer in conducting a systematic review of electronic records and in reviewing specific items in response to a request. ERA will allow the access reviewer to coordinate the review with equity owners outside of NARA when necessary. ERA will track the status of the item when the review is complete, and will facilitate redaction of access restricted or classified information from otherwise open items. ERA will allow the access reviewer to change determinations over time in subsequent reviews and appeals, and to keep track of the different releases of the item over time.

The access reviewer will also perform mediated searches on behalf of consumers.

6.5.1 Access Reviewer

The access review staff, including reviewers and managers, is responsible for reviewing security classified or otherwise access-restricted information in order to determine if the information can be made available to a consumer. Whether it is a systematic review or a user requested review (usually based upon provisions of the Freedom of Information Act (FOIA)), the review procedures are the same. One or more of the following conditions prompts the need for a review.

- The initial review during processing recommended further action in the form of a systematic review;
- A consumer has requested access to specific records which may require review; and/or
- Transfer and other documentation indicate that the access-restricted information is included or potentially included in a set of records.

6.5.2 Access Reviewer Activities

1. Initiation of Review

- Using information captured when the records are transferred and processed, ERA notifies the access review staff that there are records that require access review. ERA assists management in prioritizing review work by providing information regarding overall workload, time-sensitive nature of the records, volume of records, and availability of declassification guidelines for the records. A NARA manager then uses ERA to initiate the review project and define the scope. For example, large groups of records may be broken into several projects. The review sequence for the project is defined; some

projects will require second reviewers, Presidential representatives, Vice Presidential representatives, etc. ERA assigns a tracking identification to the project and begins tracking the stages of the review.

2. Determination

- To supplement the information provided in the records, the access reviewer uses ERA to help locate potentially access-restricted information by searching for specified keywords, concepts, record types, and formats.

- The access reviewer reads each item and determines if information in the item is subject to applicable restrictions. Once the appropriate restrictions on access have been identified, the review provides justification for each restriction applied. During the review, the access reviewer identifies equity holders for the information in the item.

- The access reviewer makes determinations about whether items should be released, withheld, or whether a redacted version should be created and released.

- ERA captures the justification (e.g., which restrictions apply to the information, such as FOIA, Presidential Records Act (PRA) exemption, etc.) for any withdrawing, redaction, or any other determination. The access reviewer assigns a sensitivity level to the records. ERA identifies the records according to their status and associates the record with the reasons for the actions.

3. Tracking and Notification

- The access reviewer uses ERA to coordinate the review with other agencies or reviewers as appropriate. ERA tracks information about the coordination process: Where are the items sent? When are they sent? When are they returned? What were the determinations and corresponding reasons of the outside equity holders? When is the referral complete?

- ERA notifies second or subsequent reviewers (who could include representatives of other agencies and of former and incumbent Presidents) when they must perform additional review. ERA tracks when review is complete and notifies the consumer if the item is open, available only in redacted form, or withheld.

- If the requestor appeals NARA's determinations, ERA captures information about the appeal request (i.e., when received, what was appealed) and manages the workflow of review for the appeal. If the appeal was successful, the access reviewer can change previous determinations and ERA will capture additional versions of the appealed items.

- ERA produces statistics on access review work based on a scheduled reporting scheme for performance reporting, the Annual FOIA Report, and other reporting and management requirements.

6.6 Consumer Scenario

This scenario describes how the consumer will employ ERA to search for, access, and retrieve electronic records. ERA will support search of descriptions of all records, and show defined relationships between the sets of electronic records and non-electronic records; however, those capabilities are not described in this scenario. ERA will allow a broad array of search and retrieval capabilities that can be adapted to each consumer's needs, privileges, and clearances.

6.6.1 Consumer

A consumer is any individual or organization who wishes to identify or obtain access to or copies of electronic records that preserved in ERA. These individuals fall into three broad types.

- ***Transferring Entity,*** including agency records creators, records officers, agency resource managers, courts, congressional staff, presidential administrations and staff, and others. A Transferring Entity has access to its own records which are in NARA's physical custody but remain under the legal authority of the producer.

- ***NARA staff members,*** including those NARA staff members that undertake access review, arrangement and description, order fulfillment, preservation activities, records management, reference services, systems operations, and others. NARA staff constitutes a special class of consumers for records needed in the performance of their duties.

- ***Public,*** including authors, congressional researchers, the White House, the Courts, Federal Government agencies, contract researchers, educators, exhibition preparation staff, genealogists, family and local historians, filmmakers, information service providers, interpreters, publishers, rights recipients (federal employees, immigrants, and veterans), reporters and the media, scholars (historians, other social scientists, and scientists), state and local government personnel, professional organizations and their members, supporters' groups, foundations, donors of historical materials, students, and the general public.

6.6.2 Consumer Activities

The Consumer will undertake the following steps in using ERA to obtain electronic records. (The steps listed below should not be necessarily interpreted as a sequence of events. For example, steps 2 and 3 can occur in a different order than shown here.)

1. Access

- All consumers will be able to search and retrieve descriptions of all records accessioned by NARA. In addition, they will be able to search and retrieve electronic records which have no access restrictions that are maintained in ERA. Consumers with special access rights (clearances) and privileges may check those clearances with ERA upon accessing the system.

2. Search

- The consumer searches ERA for information describing electronic records and for actual content within electronic records. Such searching may be done at a variety of levels of aggregation (i.e., record group or set, series, file unit, or item). Within the consumer's given access rights and privileges, the consumer may take advantage of available functions and features. ERA responds to search queries against descriptions by supplying the descriptions that match the search criteria. Normally, records are described at the set level, such as series or file unit. If records lifecycle data identifies a group of electronic records of interest, the consumer may proceed to run queries against the content of those records. ERA responds to such search queries by identifying either sets of electronic records, or individual electronic records, with results constrained by the consumer's access rights. ERA provides the capability for the consumer to view and/or sort the results of the search, modify the search if necessary, and refine or save search results as desired. The consumer is able to perform these functions in an iterative manner, thus permitting the user to progress from a search about a general topic to a list of specific electronic records that the consumer may wish to view.

3. Retrieve/Receive

- From search results that identify relevant electronic records, ERA allows the consumer to view and access the electronic records desired. The consumer directly interacts with the ERA system and accesses records in accordance with established privileges and access rights. The consumer may request the ERA system to output electronic records to a selected medium or print them in formats with parameters chosen from available options. ERA also provides the capability to direct output via telecommunications, for example, using File Transfer Protocol (FTP). The consumer may use search and retrieval capabilities without any involvement of NARA staff, but if at any time the consumer has questions, has trouble searching, requires services, or is unable to retrieve/receive records due to access restrictions, ERA provides the consumer the capability to request a mediated search.

4. Mediated Search Request

- The consumer may request help from NARA staff while using ERA. A mediated request may include such activities as NARA staff answering questions, conducting and handling searches, providing certified copies, processing special requests, expediting requests, handling FOIA appeals, and similar issues. ERA tracks the communication and information about the mediated request. After all questions are answered, issues resolved, and special requests processed, the consumer retrieves/receives electronic records as described in **Number 3**, Retrieve/Receive (see above). If the electronic records are restricted the consumer may instead receive information concerning the status of a particular request.

5. Fee for Service

- Public consumers may request products that require them to pay a fee. If a fee must be collected or charged-back for any special product during this process, ERA tracks, reports upon, and routes any required financial transaction information to all appropriate billing/accounting systems, and provides the requested product on authorization by the billing/accounting system.

- Federal agencies storing records in NARA's Federal Records Centers reimburse NARA for all services. ERA instances that store temporary Federal records track services provided under each records center customer account, and reports upon and routes this information to the centers' billing/accounting system.

6.7 Administrative User Scenario

This scenario is included to demonstrate some of the capabilities that would be included in ERA for the administrative user of the system. Not all administrative capabilities are described in the scenario and many of the system functions will be done without user involvement.

6.7.1 Administrative User

The administrative users are those that handle such activities as assigning user rights and privileges, scheduling reports, monitoring the system, modifying workflow, and ensuring system availability.

6.7.2 Administrative User Activities

1. Assign user rights and privileges

- Using NARA predefined roles (which includes information regarding clearances held, permissions granted, job roles), the administrative user creates the user account establishing requested access rights and privileges in the System (i.e., user profile is created). For example, users with appropriate clearances will be able to view classified records necessary for their work. The user is granted appropriate access rights (e.g., access to access-restricted data or administrative access) and systems capabilities (e.g., ability to edit, input data, check security, produce user reports). Note that users with "public" access rights can be created by ERA, and that user accounts can also be established for those users who wish to avail themselves of fee services.

2. Schedule Reports

- The administrative user logs on to ERA and uses any data available in the system to create new reports or modify existing reports. The request for reports could be based on a specific requirement from NARA or from a system monitoring need. The reports could provide metric data for such activities as system usage, system capacity, performance, and workflow statistics. ERA provides the ability to manage reports (i.e., create, modify,

save, delete) and has the ability to output the reports via a user interface, media, or to external systems. ERA can also make reports available to other users of the system.

- The reports are scheduled for regular distribution to the appropriate people or are created on as needed basis.

- Schedules and contents of scheduled reports can later be changed as required.

3. Monitor System

- ERA provides the administrative user with the ability to monitor system performance and security using system tools such as a dashboard. The dashboard is an integrated set of diagnostic tools that is used for monitoring the health of the system. It monitors storage, performance, space, load, security-related indicators, etc. When a system status alarm occurs (as indicated on the dashboard) indicating a system problem/fault or a potential security problem, the system alarm log is updated with alarm type/number, and time and date stamp of the occurrence for audit trail purposes. Additionally, the system notifies the administrative user of the problem via automatic paging, telephone call, or some other method.

- The administrative user, with help from support staff, diagnoses and troubleshoots problems implementing intrusion detection system and virus control procedures. In parallel, the system is recording these events in system logs and establishing an audit trail.

- Once the problem has been corrected the administrative user ensures that the system's operations are secure from intrusion, viruses, unauthorized access, etc., i.e., the system performance is as intended.

4. Modify Workflow

- In some instances the administrative user will be able to modify workflow. This does not mean that the administrative user will be able to modify rules, assignments, etc., for NARA's records lifecycle workflow using the system. The administrative user will be able to modify work flowing through the system at a point in time when problems with the system arise.

- When the administrative user is alerted to a potential problem with the system (e.g., a problem with the server has occurred) or has been notified of a problem and workaround recommendation by the NARA Manager, the administrative user notifies the appropriate support staff who diagnoses and troubleshoots the problem, and temporarily modifies system workflow(s) to ensure continued service.

- The administrative user notifies the appropriate NARA Manager of the temporary modification to workflow. The administrative user tracks the resolution of the problem

for audit trail purposes and the modified system workflow(s) will exist in the system until the problem can be corrected.

6.8 NARA Manager Scenario

This scenario is included to demonstrate the interaction of the NARA manager with the workflow capabilities of the ERA system, and the interaction with the ERA administrative user. Note that some steps are performed by the system without the need for human intervention, and some are a combination of system and human activities.

6.8.1 NARA Manager

NARA managers are those users who are responsible for making decisions related to the records lifecycle management and processing activities and assignment of personnel to perform the archival work as scheduled. Responsibility for the completion of archival tasks rests with the NARA manager. The NARA manager also interfaces with the administrative user when system problems disrupt the flow of work.

6.8.2 NARA Manager Activities

1. Job Pending

- The NARA manager logs onto the system and receives a notification from the system that a job is ready for processing. The notification indicates that records are being transferred into the system according to their schedule. The system, using predefined NARA business process rules is able to determine what activities need to occur. Based on these rules, the system can decide to create a job, assign jobs to staff, assign due dates, note access restrictions, and provide relevant information about the records in the job.

2. Review System Assignments

- The NARA manager reviews the assignments identified by the system and selects from the options that are presented:
  - Confirm the assignments,
  - Modify the assignments.

- Confirm Assignments
  - Upon confirmation by the NARA manager, the system notifies staff of their assignments including milestones and begins to track the job, which includes capturing performance statistics.
  - As the job proceeds, the system is able to send notifications, collect approvals, detect when processing has been suspended, make additional assignments, or notify the NARA manager that the job is complete.

- Modify Assignments

- Upon inspection of the job, the NARA manager has the capability to modify the steps, adding or removing steps, or changing the order of the steps to be performed to process the job as a candidate workflow.
- The system will either confirm the modification or may determine that additional steps are necessary requiring the NARA manager to make additional modifications.
- Upon approval, notifications are sent to staff alerting them of their assignments.

3. Approval and Closure of Processing

- As the job progresses through the system, there are various junctures when NARA manager approval is required. The NARA manager will inspect jobs on a periodic basis and provide approval as appropriate, including final approval that the job has successfully been completed.

- If the NARA manager disapproves a job pending completion approval, notification will be sent to staff providing the determination and justification (for the decision), and possible fixes.

- Staff will modify the proposed processing and the approved job will be processed per normal course of operation.

- Upon final approval, the system captures this information and stops tracking the job.

4. Modify Workflow

- When notified by the system that identified steps are not occurring as scheduled, the NARA manager has the capability to examine the system in an attempt to understand and/or determine the nature of the problem. Possible problems could be related to bottlenecks in the system or due to inability of NARA staff to complete tasks.

- The NARA manager may have to interface with the system administrator and recommend possible solutions (if due to a bottleneck in the system) or interface with NARA staff to determine the nature of the problem and recommend solutions.

- The system administrator has the capability to implement an agreed upon solution in order for processing to continue.

6.9 System Characteristics

In addition to the user scenarios described above, the proposed ERA system includes a number of system characteristics that translate into functional, architectural, and performance-related capabilities. Specifically, the proposed system should support subscriptions, service management, availability, and performance.

6.9.1 Subscriptions

According to the *ERA RD*, a subscription is a standing instruction stipulating a specific action to be taken by the system on behalf of the user at the occurrence of a trigger event. Some triggers may include:

- A series is updated with new records,
- A new record type is defined and added to ERA assets,
- A new template is created or modified,
- Specified records are proposed for deletion, and
- Records redactions are completed.

ERA should manage user subscriptions (for users) by providing the capability to create, modify, delete, suspend, and resume their subscriptions.

The user will select the desired subscription service based on the occurrence of a trigger and provide required information when prompted by the system. If the service has a fee associated with it, ERA will present the cost information to the user. The user will confirm the desired fee for service subscription and upon confirmation ERA will interface to external systems (e.g., financial system) and the user indicating that the subscription order has been placed. The subscription order is stored in the system until such time as the trigger is executed. Upon execution, ERA acts and sends a notification with the results of the subscription to the user.

6.9.2 Service Management

As excerpted from the *ERA RD*, service management consists of support for queuing of services, monitoring service progress, prioritization of services, preemption of a service, suspension of service processing, and resumption of services. Check pointing is required, as is the ability to limit service execution times.

6.9.3 Availability

The proposed ERA system availability requirements will be based on an individual service or feature. ERA, as proposed, should also be developed with no single point of failure and should provide for the continuity of operations in emergency or catastrophic situations. In addition to individual requirements for recovery and archival storage, the *ERA RD* provides a table listing the availability requirements for individual services and functions. Some items in the table include:

- Search electronic assets,
- Access electronic assets,
- Redaction,
- Perform access review,
- User communications, and
- Access the system via an electronic interface.

6.9.4 Performance

The proposed ERA system should be scalable to one exabyte of total storage and ten teraobjects without major design changes. Record volume requirements concerning ingest, accumulated archive volumes, and concurrent number of users can be found in the *ERA RD*. Specific performance requirements for peak system load capacity can also be found in the *ERA RD*.

6.10 Facilities

The proposed ERA system may require a complex physical infrastructure that translates to physical space that will be required to accommodate the challenges posed by the enormous volume of electronic records that it will store. This is complicated by the rapidly changing nature of the systems that are used to create electronic records. Facilities requirements will be based on the future design of the system.

7.0 Summary of Impacts

The implementation of the proposed ERA system may have wide ranging impacts on both NARA and its customers. The sub-sections below identify potential impacts that should be considered as NARA develops plans for the proposed ERA system.

7.1 Operational Impacts

NARA will have to implement changes to the way it conducts business in order to achieve the agency's mission, goals, and objectives in archiving electronic records. The proposed ERA system will facilitate this endeavor. When implemented, the ERA system will have the ability to handle vastly more electronic records, as well as records with a wider variety of formats, than NARA has been capable of addressing in the past.

NARA has been responsive to the challenge and is currently conducting a review of agency business processes with its Lifecycle BPR activity, and is also engaged in conceptual data modeling and enterprise architecture restructuring efforts. The proposed ERA system should provide decision support for NARA management processes for the lifecycle management of records of all types. This includes supporting processes for such activities as appraisal, scheduling, and description that apply to both electronic records and records in other media. Additional operational impacts may include the following items.

- Reengineering enterprise security;
- Data architecture modeling;
- Disaster or catastrophic recovery;
- Advances in technology;
- A reexamination of archival principles as they relate to electronic records;
- The production of templates for each record type will cause an increased workload but will be needed to facilitate validation, preservation, and access; and
- Changes to operational procedures.

7.2 Organizational Impacts

NARA is examining current policies and business practices and may have to develop and/or modify policies and business practices as necessary. ERA may also require the revision of position descriptions to reflect changes in NARA's business practices. Possible organizational impacts include:

- An assessment of how ERA fits organizationally within NARA and relates to NARA program units;
- The commitment of resources (e.g., funding, time, staff) by NARA and Transferring Entities to efforts to address electronic records needs in the first phases in the records lifecycle;
- The need for cross-functional, inter-disciplinary staff teams;
- The development of education and increased training for both NARA staff and consumers;
- The need for additional personnel for a robust help desk facility for NARA staff and consumers;
- Improved opportunities for career development for NARA staff;
- An opportunity for agencies, states, and other entities to avail themselves of ERA technology for their own system design purposes;
- Relationships between NARA and Transferring Entities; and
- Localization of NARA activities and resources in terms of both their distribution over Washington Headquarters and regional operations and the provision of customer services which are truly nationwide and have no inherent local focus.

7.3 Impacts During Development

Major impacts to be considered during development are provided below.

- Initial implementation of transition plans for current systems to include considerations of parallel operations and its impact on ERA;
- Articulation of business rules, templates, and other controls needed for operational implementation;
- Development of training for requirements to be implemented in an increment; and
- Training necessary for rollout of the increment.

8.0 Analysis of the Proposed ERA

Various improvements, disadvantages and limitations, and alternatives and trade-offs considered are covered in this section.

8.1 Summary of Improvements

When implemented, the ERA system will offer numerous benefits to NARA and consumers including:

- The preservation of electronic records that would otherwise be lost,
- A wider variety of electronic records in NARA assets,
- Consolidated electronic records administration and streamlined internal workflow,
- More involvement with Transferring Entities in the early phases of the records lifecycle,
- New tools to support processing and access review of electronic records:
  - Tools to aid in access review decisions,
  - Tools for withdrawal and redaction, and
  - Tools for description,
- Faster access to electronic records,
- The ability to service additional consumers,
- Increased responsiveness and consistency with consumers,
- Remote access to electronic records, and
- Enhanced capabilities for searching electronic records.

8.2 Disadvantages and Limitations

Potential disadvantages or limitations of the proposed ERA system include:

- High development costs,
- High costs associated with security,
- NARA staff anxiety brought about by new responsibilities resulting from changes due to electronic records,
- Poor NARA staff morale without proactive change management,
- Impact on Transferring Entities (resources required to prepare for transfer of materials to NARA, greater records management responsibilities), and
- User misunderstanding of ERA's relation to NARA's non-electronic assets.

8.3 Alternatives and Tradeoffs

Alternatives to the proposed ERA system are documented in the *ERA Analysis of Alternatives (AoA)* document. Refer to the *ERA AoA* for detailed information pertaining to this topic.

9.0 Notes

The technical terms used in this document are defined in IEEE Std 610.12-1990, *IEEE Standard Glossary of Software Engineering Terminology*. **Table 9-1, Acronyms**, provides a list of acronyms used herein.

ACRONYM	DEFINITION
AAD	Access to Archival Databases
ADRRES	Archives Document Review and Redaction System
AERIC	Archival Electronic Records Inspection and Control
AMIS	Accession Management Information System

ACRONYM	DEFINITION
AoA	Analysis of Alternatives
APS	Archival Preservation System
ARC	Archival Research Catalog
ASCII	American Standard Code for Information Interchange
BPR	Business Process Reengineering
CCSDS	Consultative Committee for Space Data Systems
CFR	Code of Federal Regulations
ConOps	Concept of Operations
DVD	Digital Versatile Device
EAP	Electronic Access Project
EBCDIC	Extended Binary Coded Decimal Interchange Code
ERA	Electronic Records Archives
ERM	Electronic Records Management
FOIA	Freedom of Information Act
FTP	File Transfer Protocol
GB	Gigabyte
GIS	Geographical Information System
IBM	International Business Machines
IEEE	Institute of Electrical and Electronics Engineers
IP	Internet Protocol
IPT	Integrated Product Team
ISO	International Organization for Standardization
IT	Information Technology
MB	Megabyte
MNS	Mission Needs Statement
MS	Microsoft
NARA	National Archives and Records Administration
NWCTF	Special Access/FOIA LICON, Office of Records Services - Washington, DC
NWMD	Initial Processing/Declassification Division, Office of Records Services - Washington, DC
NWME	Electronic and Special Media Records Services Division, Office of Records Services – Washington, DC
OAIS	Open Archival Information System
OFAS	Order Fulfillment and Accounting System
PRA	Presidential Records Act
RD	Requirements Document
RMI	Records Management Initiative
SCI	Sensitive Compartmented Information
SF	Standard Form
TS	Top Secret
UC	Use Case

ACRONYM	DEFINITION
UCD	Use Case Document
UML	Unified Modeling Language
URTS	Unclassified Redaction and Tracking System

Table 9-1: Acronyms