*MFA*H *The Museum of Fine Arts, Houston*

Electronic Records Archives Start-Up Project

Concept of Operations

NHPRC Grant Number NAR10-RE-10029-10

MFAH Project 80469

Wednesday, July 27, 2011

Signature Page

I recommend approval of the Concept of Operations (ConOps),

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MFA**H** *The Museum of Fine Arts, Houston*

Document Change Control Sheet

Date	Filename	Draft/Version	Author	Description
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5/4/11	ERA_ConOps_d02_110504.doc	Draft 2	Dave Thompson	Operational Scenarios
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Preface

The MFAH Archives ensures, for the MFAH and its constituents, ready access to essential evidence that documents the history and actions of the MFAH. Increasingly, these records are created and maintained in electronic formats. To continue to fulfill its mission, MFAH Archives needs to respond effectively to the challenge posed by the diversity, complexity, and enormous volume of electronic records being created today and the rapidly changing nature of the systems that are used to create them.

To that end, the Electronic Records Archive (ERA) system, when complete, will provide a dynamic means of capturing, retaining, and presenting records upon request. This Concept of Operations (ConOps) document provides a conceptual overview of the proposed ERA system. The ConOps is intended to support the evolution of a fully integrated, modernized, and functional system where records of the MFAH will be available to the public in perpetuity. Moreover, the ConOps is a living document and will be coordinated in a collaborative manner with all stakeholders to ensure the viability of the concepts represented.

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 point of view. 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

This document describes the Concept of Operations (*ConOps*) for the MFAH Electronic Records Archive (ERA) Project, MFAH IT Project Number 80469. The information presented in the ERA *ConOps* should be reviewed jointly with the ERA *Request for Proposal (RFP)* as the it explores in detail the requirements for the MFAH ERA.

1.2 Document Overview

The ERA *ConOps* document serves as a vehicle to communicate the high-level quantitative and qualitative 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 Open Archival Information System (OAIS) reference model to efficiently address these challenges. Lastly, there are no security or privacy considerations attached to the use or distribution of this document.

- **Section 1** describes the approach for developing the *ConOps*.
- **Section 2** provides a list of reference documentation that was used in the creation of the document.
- **Section 3** describes the current MFAH Archives 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.
- **Section 10** is reserved for appendices.
- **Section 11** provides a glossary of archival terms used herein.

1.2.1 *Approach*

Because of the extensive work and documentation the National Archives and Records Administration (NARA) has already produced for its own ERA Project, the MFAH Information Technology Department (MFAH IT) chose to use the final version (4.0) of NARA's *ConOps* document as the basis of this document. Much of the language in this document is taken directly from the NARA document and edited for this specific project and organization.

Although the NARA *ConOps* document provided a good start to this *ConOps* document, MFAH IT found it necessary to better understand the MFAH ERA Project and produce a more thoughtful and MFAH-specific *ConOps* by doing background reading and research in Archives and Records Management theory and practice, use case analysis, and domain modeling. MFAH Archives carefully reviewed the NARA document so that it would reflect only the basic ERA functions required by the MFAH at this time.

1.2.2. IEEE Standard

In addition to using language directly from the NARA *ConOps* document, this *ERA ConOps* document was generated using guidance from IEEE Std. 1362-1998, *IEEE Guide for Information Technology-System Definition-Concept of Operations (ConOps) Document*.

1.3 System Overview

The proposed ERA system will ingest, preserve, and provide access to electronic records of the MFAH and donated historical electronic material in MFAH's custody. The proposed ERA system is envisioned as a comprehensive and persistent system for preserving institutional archival records, as defined by the existing records management program, and donated archival collections in electronic form. Preservation of the ERA Content Objects will be independent of specific hardware and/or software. The ERA, when operational, will allow the MFAH Archives to retrieve records in response to staff and public research needs, as well as to e-discovery. The actual locations of the ERA operating site will be on the current MFAH Archives campus. MFAH sites for data recovery and continuity of operations will cover the ERA system. Where the proposed ERA system fits organizationally is provided in **Section 5.5.1, Organizational Structure**.

As mentioned above, the Request for Proposals issued by the MFAH details the requirements for the ERA system. The original grant application, funded by the National Historic Publications and Records Commission as NAR10-RE100290, along with the MFAH's Response to Review, are other documents that aid in the understanding of the *ConOps* document. The documents submitted to NHPRC provide the initial aspirations for the system as well as MFAH Administration's authorization.

Finally, the MFAH Archives ERA Project is defined as a Major Project per the MFAH IT and Archives departments since it: represents a significant investment in time, as a multi-year project; will require a substantial financial investment; addresses functionality basic to the operations of the MFAH Archives; and responds to re-accreditation requirements of the Association of American Museums (AAM).

System Overview

Data Objects
Transmitted MFAH
Servers

& Donated collections
via portable devices

Accessioning area

Database of associated
metadata

Storage of data content objects

Dissemination area for
Queries executed against data content
objects and associated metadata

Consumers

2.0   Referenced Documents

2.1   Standards and Guidelines

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

- National Archives and Records Administration, ConOps v4.0, *Concept of Operations*, July 27, 2004
- 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, 1988
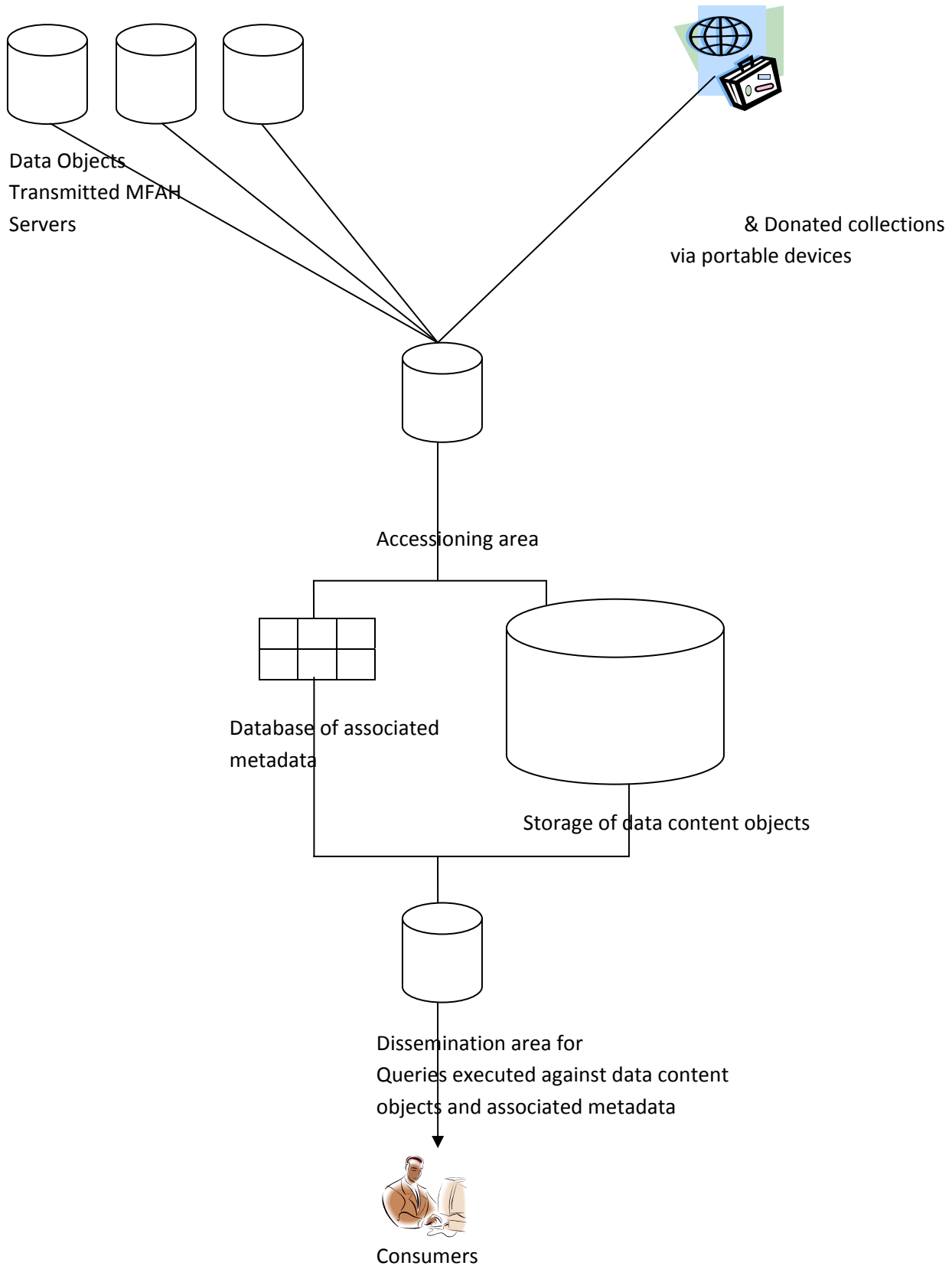- ISO standard 14721:2003: *Space Data and Information Transfer Systems – Open Archival Information System – Reference Model* on February 24, 2003
- Consultative Committee for Space Data Systems, CCSDS-650.0-P-1.1, *Reference Model for an Open Archival Information System (OAIS)*, Pink Book, August 2009
- Consultative Committee for Space Data Systems, CCSDS-652.0-R-1, *Audit and Certification of Trustworthy Digital Repositories,* Red Book, October 2009
- Association of Record Managers and Administrators, *Generally Accepted Recordkeeping Practices Maturity Model,* 2009
- The technical terms used in this document are defined in IEEE Std. 610.12-1990*, IEEE Standard Glossary of Software Engineering Terminology.*

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. The MFAH consulted the ISO standard and the more recent Pink Book version of CCSDS-650.0 dated August 2009.

2.2   MFAH Documentation

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

- NHRPC Grant NAR10-RE-10029-10

2.3   Other Documentation

Other documentation and references used to support the development of this document includes *Modern Archives: Principles and Techniques* by T.R. Schellenberg, reissued in 2003 by the Society of American Archivists.

3.0 Current Situation

3.1 Background, Objectives, and Scope

The Museum of Fine Arts, Houston
Established in 1900, the Museum of Fine Arts, Houston (MFAH), is steadfast in its mission to serve as a place for all people through excellence in the collection, exhibition, preservation, conservation, and interpretation of art. Each year, more than two million visitors engage with the museum's permanent collection of more than 58,000 objects and with the artists and artworks featured in special presentations and programs both on- and off-site.

The MFAH is governed by a Board of Trustees of ninety members. Currently, there are seventy-five life and elected trustees, and fifteen trustees who serve as honorary or ex-officio members. Twenty-eight trustee committees and subcommittees are staffed by the museum's director, associate directors, department heads, or curators, and—in addition to trustees—include more than 300 committee consultants. The Long-Range Planning Committee comprises seventeen members who annually review the Long-Range Plan, which was first drafted in 1984. All departments in the institution participate in the ongoing planning and revision process, which identifies goals and objectives toward which MFAH operations and programs are directed in order to uphold the mission "dedicated to the pursuit of excellence in art through collection, exhibition, and instruction." For the past twenty-five years, trustees and staff have worked in accordance with the dictates of the Long-Range Plan to improve the performance of the MFAH. In the four divisions of the institution—the Glassell School of Art, Bayou Bend Collection and Gardens, Rienzi, and the art museum—significant improvements have been made in all areas of operation, from the physical plant and administration to collection growth and management, exhibition, and education.

MFAH Archives
One of the country's first museum archives, The MFAH Archives was founded in 1984 through generous funding from the National Historical Publications and Records Commission (NHPRC).

The mission is to preserve and make available for research the museum's permanent records. The institutional records of the MFAH date from 1900, when the museum was founded, and include correspondence, schedules, subject files, program files, ephemera, and exhibition files. Primary source material chronicles not only the history of the MFAH, but also the artistic and cultural development of Houston. Material is also maintained from prominent artists, collectors, and figures such as the Art Guys, Manfred Heiting, Ima Hogg, and Sally Walsh. Generally, files are available for public research after 15 years, though access to some materials may be limited.

Now in its twenty-fifth year, the Archives functions as the memory of the institution. Through the years, the MFAH Archives' primary function has remained that of an institutional archive, while also acquiring such significant collections as the Edith A. and Percy S. Straus Collection Papers, the James Johnson Sweeney Papers, the Manfred Heiting Papers, and the Garth Clark Gallery Archive. As MFAH director Peter C. Marzio wrote in his foreword to the Society of American Archivists' *Museum Archives: An Introduction*, 2004:

"There we find the dreams of the founders and the pathways of ensuing generations that sought to make those dreams into realities. From soaring manifestos to long-range planning documents to daily meeting schedules to deeds of gifts and records of contributions, the archives retains for all time the raw, historical record of human beings working to build an institution in the service of humanity."

3.2   Operational Policies and Constraints

This section describes some general operational policies and constraints affecting the current system:

- **Hours of operation –** The MFAH Archives office operates from 9:00 a.m. to 5:00 p.m. Monday through Friday.
- **Available personnel –** The MFAH Archives department consists five full-time positions; the Director, Archives Assistant, Archivist, Processing Archivist, and Records Manager. One person in each MFAH department is designated the role of Records Management Coordinator (RM Coordinator) and is responsible for sending department records to MFAH Archives. Because this role is not a full-time position, MFAH Archives' ability to process new records is dependent on each individual RM Coordinator's schedule and available time.
- **Computer hardware, software, operating systems –** By design, the MFAH network, mission-critical systems, and nearly all hardware, software and operating systems are based on Microsoft or Microsoft-compatible technology.
- **Operational facilities, office space –** Because the Archives program is an analog system, the ability to archive and preserve museum records is constrained by the decreasing number of linear feet of storage space currently available.

3.3   Description of the Current Situation

Following an institution-wide records survey conducted by the MFAH Archives staff, the MFAH instituted a records management program under the auspices of the Archives in 1994. Results of the survey, input from various museum departments, and research of statutory requirements—as well as knowledge about the recordkeeping practices of other institutions—were used to create detailed record retention schedules. Vetted by the MFAH's legal counsel and authorized by its administration, the record retention schedules and guidelines for the program were compiled into the *MFAH Records Management Guide*, which is widely recognized among museum archivists as a prototype and model within the field, and is often requested by cultural institutions seeking to implement a records management program.

In its fifteen years of operation, the records management program has "fed" the archival program by the systematic identification and transfer of records of permanent evidentiary and informational value. The records management program has assured compliance with statutes regulating record retention and litigation holds; authenticity of the official record; proper and routine destruction of temporary records; and disposition of redundant records. Under the program, each museum department or office has a records management coordinator who is responsible for transferring records in accordance with the established record retention schedules. Coordinators inventory the records prior to transfer, providing critical minimal-level access points to institutional records until such time as they are fully processed. Sessions introducing the archival and records management programs are held routinely as part of orientation for new staff members and as refresher training for records management coordinators and other employees as appropriate.

The MFAH Archives currently responds to approximately 400 research requests and has 50,000 visits to its Web site per year. Since its inception, the MFAH records management program has served individuals responsible for responding to legal discovery and for meeting statutory records requirements and guidelines on behalf of the museum. Internal and external traditional users—including art scholars and people conducting research in such fields as education, history, architecture, and design—will ultimately derive the maximum benefit from the ERA through increasing access to the museum's historic records.

By and large, the MFAH Archives still operates in the analog environment. Textual institutional records and donated collections are transferred in record storage boxes according to existing record retention schedules and deeds of gift. Administrative and descriptive data – such as records creator, scope and content of the records, and records classification – is entered into a MS Access database designed for accessions. Both digital photography and audio-visual recordings are routinely accessioned into the Archives via the network and removable media. The transition to the digital environment for these types of records (beginning in 2002 and 2001 respectively) was largely organic; however, other than normalization of formats, no preservation actions such as checksum monitoring are taken with them.

Current analog system

MFAH — Produce Records — Select Records — Send Records

Archives — Receive Records — Appraise Records — Ingest Records — Store Records — Retrieve Records
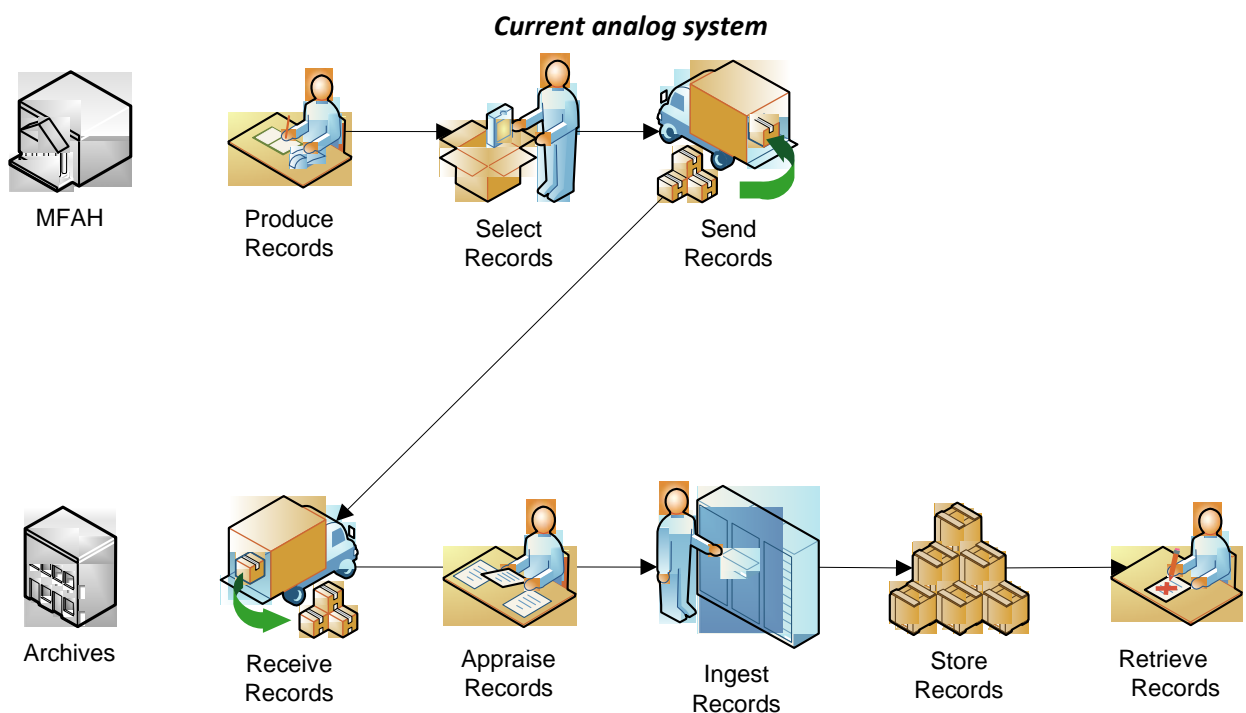
3.4   Modes of Operation for the Current Situation

This section describes the various modes of operation for the current system:

- **Normal Operations** – The MFAH Archives runs under what can be considered "normal operations" most of the time, meaning that there is no emergency situation that might affect the Archives.
- **Emergency** – An emergency situation usually refers to adverse or severe weather, such as hurricanes and tropical storms.
- **Alternate-Site** – The MFAH is currently investigating an alternate-site for continuity of operations, including the processing and storing of archived records.

3.5   User Classes and Other Involved Personnel

Refer to section **5.5** for a description of user classes and other involved personnel.

3.5.1   Organizational Structure

Refer to section **5.5.1** for the organizational structure.

3.5.2   Profiles of User Classes

Refer to section **5.5.2** for profiles of user classes.

3.5.3   Interactions among User Classes

Refer to section **5.5.3** for interactions among user classes.

3.5.4   Other Involved Personnel

Refer to section **5.5.4** for a description of other involved personnel.

3.6   Support Environment

Refer to section **5.6** for a description of the support environment.

4.0   Justification for and Nature of ERA Implementation

4.1   Justification for ERA Implementation

Since the late 1980s the museum has steadily expanded into the electronic realm through increased operating funds and support received through the private sector and granting agencies. Founded in 1994, the MFAH Information Technology (MFAH IT) department now consists of nineteen full-time employees whose work helps support the endeavors of staff, museum patrons, and researchers. Milestones of the MFAH's expansion into the electronic realm include:

- 1987: The Hirsch Library is one of only two art repositories in the entire southwestern United States asked to join the Research Libraries Group, allowing it to participate with other art libraries in the Research Libraries Information Network (RLIN)
- 1989: Implementation of the museum's first collection management system
- 1995: The MFAH is selected to participate in a national pilot project to address the use of computer-generated art images known as the Museum Educational Site Licensing Project (MESLP)
- 1996: The MFAH launches its first Web site
- 1997: The I.T. department standardizes the electronic environment to MS Office Suite
- 1997: The MFAH purchases Development database, *Millennium*
- 1998: The Hirsch Library launches its online public access catalog (OPAC), *Endeavor*
- 2000: The MFAH campus is networked
- 2003: The MFAH Archives creates a digital archive of Latin American art exhibition records as part of the *Gateway to Art/ De Puertas al Arte* project funded by The Wallace Foundation
- 2007: The MFAH Archives receives a grant from the NHPRC that allows for the placement of EAD compliant finding aids on the Web
- 2009: MFAH receives a Museums for America grant from the Institute for Museum and Library Services (IMLS) for standardizing data and customizing reports in *The Museum System (TMS)* by Gallery Systems. The system manages the permanent art collection
- 2009: The MFAH purchases a digital asset management system, *Portfolio* by Extensis, for the Image Library collection of art object photography
- 2011:   The MFAH implements an on-line retail system, *Siriusware*
- 2011:   The MFAH implements *Kronos*, a system to automate such Human Resource functions as benefit enrollments and timesheet submissions

Taking advantage of the MFAH campus network installed in 2000, the Archives enlisted a volunteer to convert the retention schedules to electronic form. Data from the original record survey worksheets—such as citations for statutory retention requirements and determinations for public research accessibility—were incorporated into a new MS Access database. In 2006, the two-year conversion project was completed and reports generated from the database, along with the guidelines included in the *MFAH Records Management Guide*, were placed on the MFAH network to facilitate staff access.

As anticipated, the creation of new museum departments and record series has necessitated periodic updates to the retention schedules. Functional codes were added to the records management database that allow for the grouping of records by function, as well as by department, as a preliminary step toward standardizing retentions

for similar records across departments and streamlining the implementation of an ERA. In 2004-05, the MFAH Archives purchased its first software subscription to research retention requirements codified in federal and state statutes; the initial subscription was replaced in 2008 by Westlaw, which is more comprehensive. In 2007, the museum has established positions for both a records manager, who works in the Archives, and a policy and compliance administrator, part of the MFAH administration department. Part of the remit of the policy and compliance administrator is to address the adaptation of Sarbanes Oxley to the non-profit sector as recommended by the AAM in its re-accreditation process for the MFAH in 2006. Further driving the museum's pursuit of an ERA is the Form 990 introduced by the IRS in 2009, which requires increased information on recordkeeping practices; the Association of Record Managers and Administrators (ARMA)'s *Generally Accepted Recordkeeping Practices*; and draft ISO standard ISO/DIS 16363 for the Audit and certification of trustworthy digital repositories.

Additional concerns of the MFAH IT department—in particular, data recovery and active server storage—are motivating the implementation of an electronic archive for documents and e-mail. In 2007, the MFAH purchased two software programs designed by EMC, *DiskXtender* and *EmailXtender* in response to these concerns. Although promoted as tools to preserve documents created in MSOffice Suite, concerns about the products' capabilities soon emerged. As a result of these shortcomings, the MFAH discontinued use of the programs.

A procedure for identifying messages of archival value amid the multitude of e-mails is just one of the daunting tasks that the MFAH faces. Ingestion, access, security, format obsolescence, authentication, data loss, and persistence are among the other challenges. Extending the MFAH records management program to include records created in voicemail or with portable electronic devices is yet another issue that optimally will be addressed in the course of the project.

Over the years, the MFAH has evaluated and amended departmental and institutional practices in response to technological challenges that have arisen. For example, as a result of the museum's experience with *EmailXtender*, the IT department now employs more extensive, in-house testing when considering any major software or hardware for purchase, to complement and supplement the manufacturer's/vendor's evaluations of product performance and functionality. This fully-functional, onsite testing will be central to the process used to select the system to be used for the MFAH ERA.

The MFAH Archives expects to encounter rapidly growing volumes of electronic records. The MFAH also anticipates increased complexity and variety in electronic records, particularly those donated by external organizations or individuals.

4.2   Description of Desired Changes

This section describes the desired changes that will occur with the implementation of an ERA:

- **Capability** changes include the ability to archive and preserve different types of electronic file formats.
- **Operational** changes will likely include increased IT support for records processing and monitoring.
- **Support** changes will include the need for increased IT support for system maintenance.

4.3   Priorities among Changes

All three of the above types of changes are essential for the ERA implementation to be successful. Refer to the Request for Proposal (RFP) for more detailed prioritization of system functionality and attributes.

4.4   Changes Considered but Not Included

There are no changes to the proposed ERA system that were considered but not included in the proposed list of ERA system attributes, capabilities, or system interfaces identified in **Sections 5.3.2** through and including **Section 5.3.4**. Changes to the items provided in those sections will not be known until the completion of the systems analysis and design phase of the ERA project. Moreover, changes that may result in newly identified requirements and/or changes to requirements cannot be considered until cost estimations have been provided.

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 MFAH Archives' operational policies or are inherent in an IT environment. The proposed ERA system assumes that:

- Electronic records will increasingly be received in self-describing and other transfer formats which facilitate preservation and sustained access
- 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, Operational Policies and Constraints**.

4.6   Adverse Effects

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

- MFAH Archives will not be able to achieve its mission if it does not build an ERA
- Electronic records that document the museum's history will be lost without an effective system for ensuring both the preservation and access to them
- 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
- MFAH Archives will not be positioned to provide adequate guidance, assistance, or services to MFAH departments to manage their electronic records.

5.0   Concepts for the Proposed System

5.1   Background, Objectives, and Scope

In January of 2010, the MFAH received a two-year grant from the National Historical Records and Publications Commission (NHRPC) to plan the implementation of an electronic records archive (ERA) for preserving the museum's permanent born-digital records. Under the grant, the MFAH Archives and Information Technology departments are collaboratively exploring emerging technologies in pursuit of a sustainable ERA system that will allow museums and other smaller archival institutions to ensure the authenticity and on-going accessibility of their electronic records. The ERA is seen as a crucial step in fulfilling the museum's continuing aim to achieve excellence in the care, documentation, and management of its institutional history and collections.

The overall goal of the project is to select the system(s) required to establish an electronic records archive (ERA) at the Museum of Fine Arts, Houston (MFAH), and design and pilot an orientation program that will broaden awareness and increase understanding of electronic records management across the institution. MFAH leadership (senior museum management and trustees) recognize the need to institute an ERA as a vital next step in fulfilling the museum's continuing aim to achieve excellence in the care, documentation, and management of its institutional history and collections. In addition to supporting the institution's Long-Range Plan goals with regard to collecting, preserving, researching, exhibitions, and interpretation, the ERA will enable the MFAH to meet the demands of operating in today's digital environment, and facilitate the museum's response to the increasing number of reporting requirements adopted by external entities such as the American Association of Museums (AAM), the Internal Revenue Service (IRS), the Association of Record Managers and Administrators (ARMA) and the International Standards Organization (ISO). Further, the ERA will ensure the continuity of the museum's archival program, allowing the institution to retain historic records dating from 1900 without significant gaps. In particular, many original records are now being created in electronic form; these records should be preserved electronically for the greatest degree of authenticity. Doing so will also streamline the reference function by replacing physical searches with electronic ones whenever possible. The MFAH further recognizes, particularly in light of the current national economic downturn, the benefits of conducting a comprehensive assessment of its digital assets and developing an integrated approach to its institutional digital landscape. The project will help the institution to assess the interconnectivity of various digital projects and plan for the re-contextualization of materials and elimination of duplicate efforts.

Finally, planning for how other MFAH systems that are generating institutional records of permanent value – such as Accounting's *Fundware,* Development's *Millennium,* Human Resources' *Kronos* and Retail's *Siriusware* - may logically extract or contribute files to the ERA could be conceptualized at this time. Some system features—incorporation or compatibility with distributed search technology, for example, which would allow search results to be retrieved from multiple databases—may be particularly appealing for departments across the institution. How the system interacts with image and other files that are linked or described in another database will be an important consideration for departments that maintain these databases. Further, a system that is able to maintain a file while making it accessible from one or more databases will reduce redundancy while assuring preservation. In addition to preserving digitized or born-digital files that are linked to external databases, the converse ability to identify and link specific records stored in the ERA would be very beneficial to fellow departments, and to the Archives for the maintenance of its Web-based and internal databases.

Scope

The MFAH will use the ERA to manage documents and e-mails, including administrative and curatorial correspondence and memoranda, trustee and staff meeting minutes, contracts, exhibition checklists, wall labels, essays, lectures, press clippings, images, grant proposals, and publications. The files document exhibitions, events, building projects, and relationships with trustees, donors, and artists; their permanent value lies in their full-picture reflection of the operation of the institution. Based on current retention policies, the ratio of record series currently designated as permanent is 65%; current electronic records include 3.5 million files occupying 20TB of disk storage, and 2.5 million e-mails.

The solid foundation laid by the current record retention schedules, infrastructure for the routine inventory and transfer of institutional records, and networked environment signals the museum's readiness to implement an electronic records archival program.

The MFAH views the sustainability and integrity of its archival collection as an institutional priority, and strives to comply with emerging guidelines for electronic recordkeeping. The opportunity to plan for an ERA will allow for careful and documented consideration of available systems, and enable museum staff to investigate and respond to current issues with electronic records management, implement an employee electronic records management orientation program, and research and solicit prospective funders (individual and corporate donors, foundations, governmental and civic agencies, and other organizations) to provide support for the implementation and sustention of the ERA, in order to fulfill the institution's commitment to the ERA. To summarize, the MFAH will:

- Select the system(s) for the MFAH ERA
- Calculate implementation and sustention budgets for the ERA; produce final budgets for each
- Adopt new policies and procedures for electronic records management
- Develop an orientation program for staff and stakeholders; conduct a pilot of the orientation program with twelve MFAH records management coordinators and designated staff members
- Identify five additional prospective funders to support the implementation and sustention of the ERA and solicit as appropriate

Two main phases of the **project** have emerged:

1) Develop a system to identify archival from non-archival records through either a traditional system for user classified records (records management software), or, alternatively, emerging analytical software
2) ERA implementation

ERA Implementation is now seen as having two major segments:

1) The appraisal of unstructured data
2) The implementation of a trustworthy digital repository. Implementation is further broken down tentatively into following sub-phases:
    1) Ingestion of MSOffice Word and Excel documents
    2) Ingestion of audio/visual and image files
    3) Ingestion of MSOffice Outlook e-mail
    4) Ingestion of complex digital objects such as databases and digital art objects, and portable device messages

5.2 Operational Policies and Constraints

All operational policies and constraints have not yet been determined. Many will be similar to those described in section **3.2**. New policies will be developed as part of this project and other constraints will be determined by the particular system implemented.

5.3 Description of the Proposed System

The following sections describe the proposed system including major system components, and proposed system attributes, capabilities, functions, interfaces with external systems and data flow, and continuity of operations.

5.3.1 Major System Components

This design requires the department RM Coordinator to actively put files into a pre-designated "archive" folder on the MFAH network according to the department's retention schedule, similar to how the RM Coordinator currently puts physical records into boxes and ships them to MFAH Archives. The ERA then retrieves and ingests the records from the "archive" folder.

Major System Classes
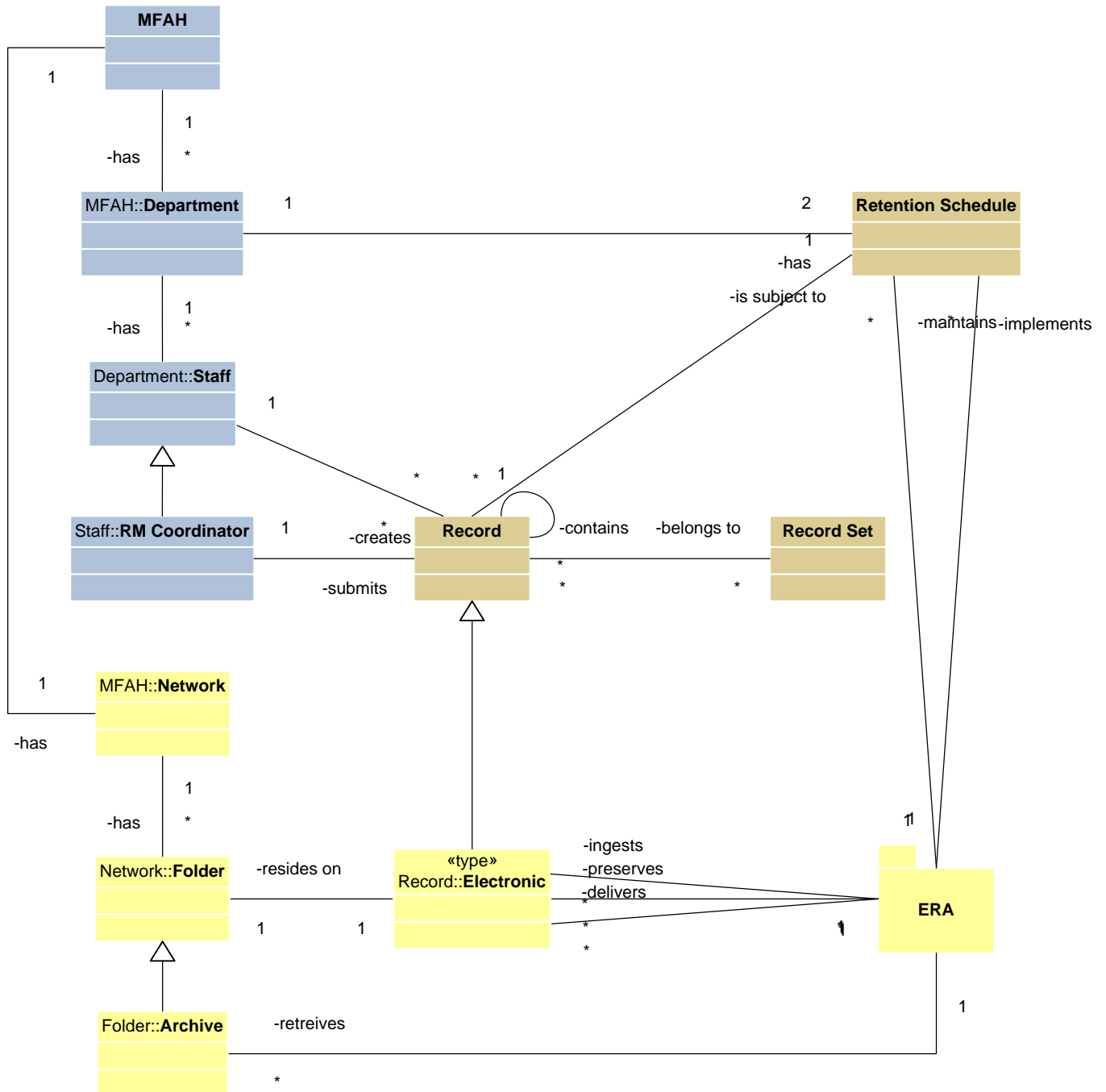
5.3.2   Proposed System Attributes

From an overall 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 or software that was used to produce them
- Modularity: the ability to use plug-in components that can be replaced with minimal impact to remaining components as workload and technology change
- Scalability: the capability to accommodate growth and manage differing sizes of repositories and ever increasing volumes of records
- Extensibility: the ability to handle additional kinds of electronic records over time, not limited to specific types of records that exist today
- Flexibility: the ability to enable MFAH Archives to tailor electronic records services in its improvements in its business process over time. Additionally, the proposed ERA system should be flexible enough to provide for interfacing with a variety of systems for transfer of records

5.3.3   Capabilities or Functions of the Proposed System

5.3.3.1 Mandatory

- The system shall have the ability to ingest and preserve unstructured, structured and semi-structured data and complex digital objects including, but not limited to, text documents, spreadsheets, e-messages, databases, multimedia digital objects, web sites, voice mail and text messages.
- The system shall have the 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.
- The system shall have the capability to provide access to records in a manner that is consistent with current technology and to adapt changing technology in order to continue to provide access to and delivery of archived content.
- The system shall have the capability to scale in order to store and preserve records based on the predicted exponential growth in the volume of archival records
- The system shall conform to mandatory responsibilities of Open Archival Information System Reference Model (ISO 14721:2003). In regards to ERA System, it shall:
  - o Obtain sufficient control of the information provided to the level needed to ensure Long Term Preservation.
  - o Ensure that the information to be preserved is Independently Understandable to the Designated Community/Consumers.
  - o Follow documented policies and procedures which ensure that the information is preserved against all reasonable contingencies . . . ensuring that it is never deleted unless allowed as part of an approved strategy. There should be no ad-hoc deletions.
  - o Make the preserved information available to the Designated Community and enable the information to be disseminated as copies of, or as traceable to, the original submitted Data Objects with evidence supporting its Authenticity.
- The system shall meet the definition of a trustworthy digital repository and be eligible for certification as such. In regards to the system, these requirements are:

o The system shall have adequate specifications enabling recognition and parsing of the SIP in order to extract necessary information and to determine what the contents of a SIP are with regard to the technical construction of its components. For example, the repository needs to be able to recognize a TIFF file and confirm that it is not simply a file with a filename ending in 'TIFF'

o The system shall have mechanisms to appropriately verify the identity of the Producer of all materials and ensure that digital files are obtained from the expected records creator/donor

o The system shall obtain sufficient control over the Data Objects to preserve them.

o The system shall have contemporaneous records of actions and administration processes that are relevant to content acquisition.

o The system shall have for each AIP or class of AIPs preserved by the repository an associated definition that is adequate for parsing the AIP and fit for longterm preservation needs, the ability to identify which definition applies to which AIP and feature a failsafe mechanism for the linkage of the associated definitions from SIP through AIP. *(See ISO 16363 Sections 4.2.2 and 4.2.3 for additional detail)*

o The system shall have a unique, persistent identifier. *(See ISO 16363 Sections 4.2.4 for additional detail.)*

o The system shall have access to necessary and customizable tools and resources to provide authoritative Representation Information permanently associated with each AIP. (*See ISO 16363 Sections 4.2.5 for additional detail.)*

o The system shall have documented processes for acquiring Preservation Description Information (PDI) for its persistently associated Content Information and acquire PDI in accordance with the documented processes. (*See ISO 16363 Sections 4.2.6 for additional detail.)*

o The system shall ensure that the Content Information of the AIPs is understandable for their Designated Community at the time of creation of the AIP.

o The system shall verify each AIP for completeness and correctness at the point it is created.

o The system shall provide an independent mechanism for verifying the Integrity of the repository collection/content by associating SIPs with AIPs or with nullifying actions such as rejection or deletion.

o The system shall have contemporaneous records of actions and administration processes that are relevant to AIP creation.

o The system shall have mechanisms in place for monitoring when Representation Information is inadequate.

o The system shall have mechanisms to allow for changes in preservation plans.

o The system shall have specifications for how the AIPs are stored down to the bit level.

o The system shall actively monitor and maintain logs of AIPs' fixity.

o The system shall have contemporaneous records of actions and administrative process relevant to AIPs and procedures for all actions taken on AIPs.

o The system shall maintain sufficient information requirements to enable the Designated Community to discover and identify material of interest.

o The system shall log and review all access management failures and anomalies.

o The system creates DIP objects that are traceable to the original AIPs with evidence supporting their authenticity.

- The system shall have the ability to ingest SIP via network, external hard-drives, or portable storage devices while maintaining integrity of files; ability to interface with MFAH network folders and Microsoft Exchange
- The system shall provide the option to capture and maintain original hierarchical file structures (directories) and file names, thus capturing the organic nature of a collection
- The system shall have the ability to ingest at collection, series or item level
- The system shall have the ability to accurately assign and maintain the provenance of data objects throughout their ingestion preservation, and retrieval
- The system shall have an ingest process which verifies each SIP for completeness and correctness.
- The system shall have the ability to check record transfers for viruses and to quarantine infected files.
- The system shall have the ability to establish access permissions, passwords and restrictions to archival content; establish and assign individuals to user groups.
- The system shall enforce restrictions on access and release of ERA's archival contents based on user groups.
- The system shall allow user groups to be applied from existing active directory.
- The system shall have ability to create and maintain full audit log of any actions within system.
- The system shall support end-to-end tracking of all records during the process of transfer, ingestion, preservation, and continuing access.
- The system shall have mechanisms to assure the integrity of the records against data loss or deliberate manipulation.
- The system shall allow for system performance monitoring and maintain system performance logs.
- The system shall possess robust system security that will operate within institutional security environment.
- The system shall have mechanisms to prohibit deletion of AIP contents without stringent approvals.
- The system shall have the ability to identify personally identifiable information, such as Social Security and credit card numbers.
- The system's database managing PDI and associated AIPs shall have a logical and stable structure.
- The system shall provide failsafe mechanism for linking PDI to AIPs.
- The system shall capture and maintain sufficient representation information on such as digital object properties as encryptions and algorithms, in order to keep ERA's archival content accessible indefinitely.
- The system shall have mechanism(s) to internally validate data entered into managing database.
- The system shall have failsafe, documented mechanism(s) for linking PDI to AIPs.
- The system shall have a unique, persistent identifier. *(See ISO 16363 Sections 4.2.4 for additional detail.*
- The system shall preserve authenticity of AIPs.
- The system shall maintain original bitstream of digital object with associated specification such as DEDSL.
- The system shall monitor for data degradation, utilizing such tools as checksums or random testing of data objects for usability.
- The system shall have for each AIP or class of AIPs an associated definition that is adequate for parsing the AIP and fit for its long-term preservation needs.
- The system shall have capability to identify the essential characteristics of the records that are being preserved.
- The system shall feature a failsafe mechanism for the linkage of the associated definitions from SIP through AIP. *(See ISO 16363 Sections 4.2.2 and 4.2.3 for additional detail)*

- The system shall provide an independent mechanism for verifying the Integrity of the repository collection/content by associating SIPs with AIPs or with nullifying actions such as rejection or deletion.
- The system shall have mechanisms to allow for changes in preservation plans.
- The system shall support different PDI metadata schema and customization of schema.
- The system shall allow for the creation and preservation of PDI, particularly in relation to provenance but also including information on context, content, and rights, throughout ingestion, storage, and retrieval.
- The system shall allow authorized modification of PDIs for existing AIPs
- The system shall have a search function that is customizable and sufficiently powerful, accurate, and rapid to respond to legal concerns—especially e-discovery—as well as to meet the needs of the archives research community
- The system shall be able to retrieve at the collection, series, or item level
- The system shall have the ability to execute queries against both descriptive metadata and content of data objects.
- The system shall support a browse function as well as a search function that reveals context of retrieved records.
- The system shall have the ability to retrieve single digital objects based on content query (as opposed to entire AIP).
- In response to an executed query, the system shall be able to extract archival content from various AIPs and associated PDI to form DIP in manner that ensures authenticity of content.
- The system shall have sufficiently robust access functionality to aid in the process of legal e-discovery.
- The system shall provide or allow for stable storage media.
- The preservation of ERA system shall be ensured against corporate/organizational changes.
- The preservation of ERA system shall be ensured against hardware and software changes.
- The preservation of ERA system shall be ensured against system failures.
- The preservation of ERA system shall be ensured against data corruption.

5.3.3.2 *Desirable*

- The system shall allow for the modification of original hierarchical file structures (directories) and file names
- The system shall have a means of associating accruals of ongoing record series, such as annual accruals of correspondence.
- The system shall allow for the exportation of administrative and descriptive metadata to external Finding Aids or catalogs utilizing XML or other method.
- The system shall have the ability to execute queries against publically accessible records through web interface.
- The system shall provide an interface for public to order and pay for requested records on-line.
- The system shall allow for dissemination of records requested by public on-line.
- The system shall generate customizable statistical reports.
- The system shall generate ERA's archival contents inventory reports.
- The system shall have the ability to systematically redact personally identifiable information, such as Social Security and credit card numbers.
- The system shall have the ability to redact information judged to be confidential at instigation of transferring entity and/or archival staff.

- The system shall allow the public a choice of format for requested DIPs.
- The system shall notify consumers that DIP is ready.
- The system shall have the ability to trigger events, such as submission ingestion packages (scheduled crawls) or response to standing orders.
- The system shall provide storage options based on anticipated frequency of AIP's use.
- The system shall allow for deletion of ERA's archival content in accordance with stringent security checks.
- The system shall issue automated confirmation receipts for SIPs.
- The system shall possess data analytical and visualization tools that will aid in pre-ingestion appraisal activities such as:
    - Extraction of e-mails of an archival nature
    - Identify unintentional redundancies and "fuzzy" duplicates of textual and image files
    - Cluster data objects according to provenance, contents, creation and modification dates, and relationships

5.3.4   *Interfaces to External Systems and Data Flow*

The proposed ERA system will be museum-wide, and will operate within the context of the MFAH Enterprise Architecture. ERA will be capable of interfacing with other applications throughout the MFAH for transfer of electronic records to MFAH Archives, retrieval of such records by their creators, and for records management processes in which MFAH Archives interacts with other entities. The volume and diversity of input and output data, and the expected heavy use of the system, will have considerable impact on the MFAH computing environment.

Interfaces to other MFAH systems will be accommodated by the proposed ERA. Specific interfaces are yet to be determined and will be described when identified, but may include:

- Microsoft Exchange
- MFAH network folders
- Kronos (Human Resources)
- Fund ware (Accounting)
- Sage Millennium (Development and Membership)
- TMS (Collections Management, descriptive metadata for web-based or other)
- Extensis Portfolio (Digital Asset Management)
- Siriusware (Ticketing and Retail)

5.3.5   *Continuity of Operations*

The MFAH has disaster recovery sites and is currently investigating an alternate site for continuity of operations.

5.4   **Modes of Operation**

Modes of operation for the proposed system have not yet been defined and are dependent on the particular system implemented.

5.5   **User Classes and Other Involved Personnel**

The following sections describe the organizational structure and the class of users, including user capabilities that are associated with the proposed ERA system.

5.5.1 Organizational Structure

The ERA system will fall under the purview of the MFAH Archives. Within the department, the Archives Director and Records Manager are members of the Project Team developing the Concept of Operations and researching systems. The ERA will be supported technologically by the MFAH Information Technology department. At least one Administrative User is anticipated to be a member of the IT department. Both the Archives and the IT departments report to the Associate Director, Administration. See diagram below.
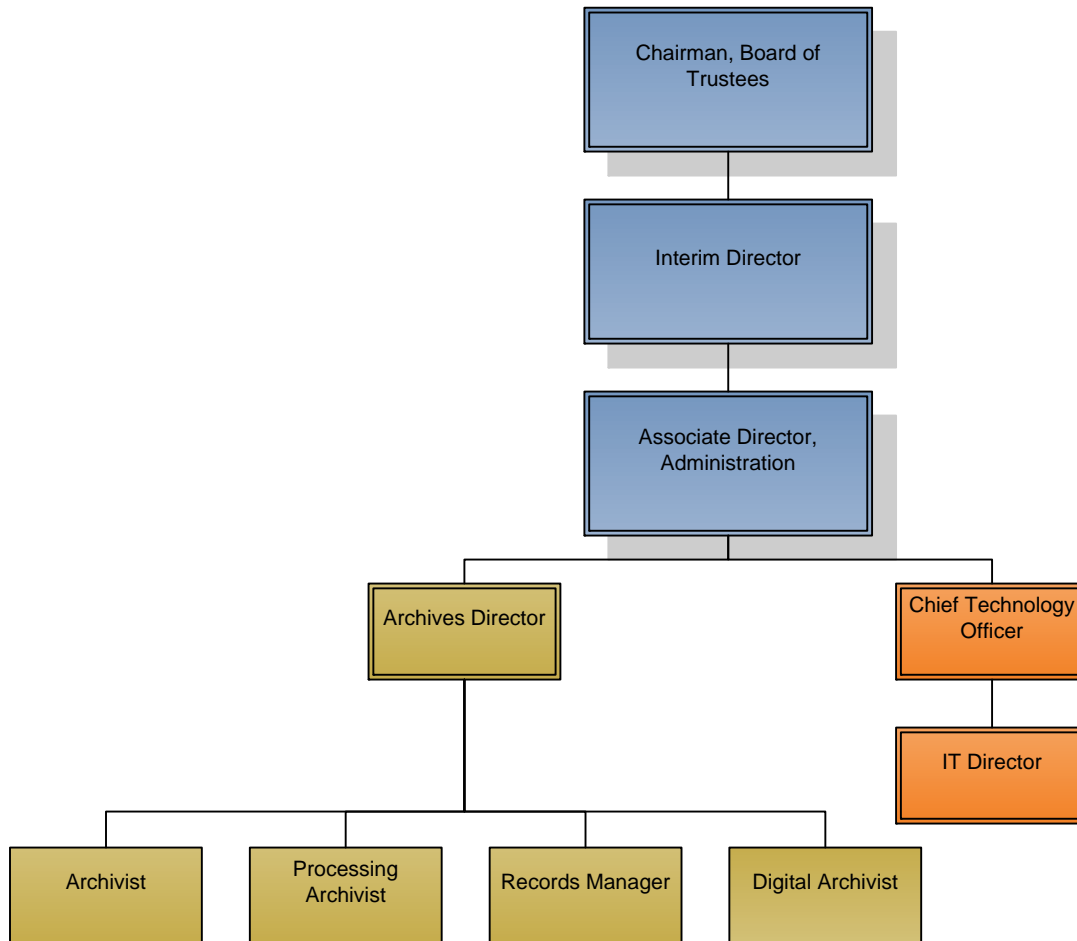
5.5.2 *Profiles of User Classes*

A user can be defined as anyone who will interact with the 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:

- **Records creator/donor** – creates or maintains records received as incoming electronic messages. Approves transfer of institutional records in accordance with existing records management policies and retention schedules. Donates collections.

- **Appraiser/Records Manager** – creates and edits record retention schedules for institutional records, assessing their vital, informational, evidential and monetary value. Reviews active files and record transfers for compliance to existing retention schedules. Appraises manuscript collections for conformity to institutional collection scope and policy, and preservation needs. Recommends which collections should be accessioned into the MFAH Archive's collection

- **Records Management Coordinator –** prepares records for transfer to the MFAH Archives in accordance with existing record retention schedules and deposit agreements. Initiates creation of Submission Ingestion Package (SIP).

- **Administrative User** – Manages transfer of records, completing and transferring SIPs; 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.

- **Accessioner** – receives and reviews SIP; checks for compliance to record retention schedules and deposit agreements; accepts or rejects SIP; reviews content of SIP for personal identifying information using automated program(s).

- **Records Processor** – identifies arrangements and creates archival descriptions of records utilizing provenance information and other descriptive metadata transferred in SIP; prepares Archives Ingestion Package (AIP) in accordance with Preservation plan; establishes Access Plan in accordance with existing MFAH Records Management Program; oversees ingestion of AIP; assigns security levels in accordance with existing MFAH records management access policies.

- **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 preservation activities, including initial and automatically scheduled verifications of AIP checksums, that ensure the ability to provide long-term access to electronic records through implementation of the Preservation and Access Plan;

- **Consumer** – uses the system to search for and access records, for administrative and research purposes, and in response to e-discovery as necessary

- **Director** – reviews system recommendations; develops metadata templates for standard file formats, (e.g., image and document files). Approves descriptive metadata. With Preserver, establishes Preservation Plans for standard file formats. As necessary, works with Preserver and Records Management Coordinator to develop Preservation Plans for non-standard file formats and complex digital objects. The director has ultimate responsibility for the completion of tasks and the quality of the products.

User Capabilities

High-level ERA capabilities correspond to specific MFAH Archives 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 (1) user class. User classes do not correspond to MFAH 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.

Record Creators/Donors

- Reviews manifest and descriptive metadata for standard file format transfers (optional).
- Approves deposit agreements and deeds of gift
- Collaborates with Director and Preserver on development of deposit agreements and preservation plans for non-standard file formats and complex digital objects
- Approves Compliance Requests.

Appraisers/Record Managers

- Runs analytical software on active servers to retrieve records that meet archival retention requirements, creating Compliance Requests.
- Submits Compliance Requests to Record Creators and RMCs.
- Edits/updates record retention schedules
- Appraises donor collections to determine if fall within collection scope of MFAH Archives
- Recommends accessioning of donor collections based on content and preservation

Records Management Coordinators

- Prepares manifest of records to be transferred in accordance with existing retention schedules.
- Completes descriptive metadata templates for standard file formats.
- Initiates Submission Ingestion Package (SIP) by forwarding manifest and templates to Administrative User
- Flags confidential records
- Receives and responds to Compliance Requests by preparing manifest of records to be transferred.
- Prepares descriptive metadata for approved Compliance Requests.

Administrative User

- Completes SIP by copying records designated in manifest utilizing software that ensures preservation of original technical metadata and links to completed standard format descriptive templates; runs initial checksums for inclusion in SIP;
- Transmits SIP to Accessioner
- Deletes copies of records on active servers after successful ingestion of AIP
- Enforces access control
- Registers users and creates user accounts
- Produces reports
- Tracks ERA usage
- Tracks automated records and system processing
- Measures performance
- Conducts disaster recovery

Accessioner

- Receives SIPs from Administrative User or Donor
- Runs virus scans for manuscript collections
- Reviews content of SIPs against manifest
- Runs checksums
- Rejects or accepts SIP
- Notifies Administrative User of SIP rejection for corruption during transfer or missing content
- Reviews submitted template for completion of core descriptive metadata elements in SIPs
- Validates that completed templates are well-formed
- Notifies RMC of SIP rejection for incomplete descriptive metadata template
- Takes legal custody of electronic records
- Runs programs to identify personal information such as Social Security and credit card numbers
- Creates/selects a Preservation and Access Plan
- Approves SIP for ingestion into ERA as AIP

Processor

- Rejects or accepts AIP
- Notifies Accessioner of AIP rejection for corruption during transfer or missing content
- Reviews and checks content and structure of data objects in AIPs using such tools as manifests and checksums
- Identifies relationships between records
- Changes relationships between electronic records as necessary
- Describes records

Preserver

- Ensures integrity of data in storage by such methods as periodically scheduled checksums
- Responsive for technology refreshment as necessary
- Tests and evaluates options for preserving and providing access to electronic records
- With Director, creates deposit agreements and preservation plans for standard file formats, non-standard file formats and complex digital objects
- Ensures trustworthy link of descriptive metadata to AIPs
- Documents all preservation processes

Consumer

- Searches archival descriptions, other assets, and electronic records using multiple criteria
- Searches and retrieves single items based on keyword and other content-based searches
- Retrieves electronic records
- Performs mediated search requests
- Searches at multiple levels of aggregation
- Views original file structure for retrieved items
- Browses original file structure

Manager

- Reviews and approves of records descriptions
- Develops Preservation Plans with Preserver and Transferring Entities
- Assigns tasks including:

- o Access review
- o Defining system workflow
- o Defining user interfaces
- Reports
- Tracks workflow with respect to people, workload, and tasks
- Generates tracking, performance, and implementation reports concerning schedules,
- Tracks access review work and produces reports regarding production

5.5.3 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. [Insert Figure] illustrates this conceptual model. The Administrative User and relevant capabilities are embedded in all components of the proposed ERA system.

User-Class Interactions
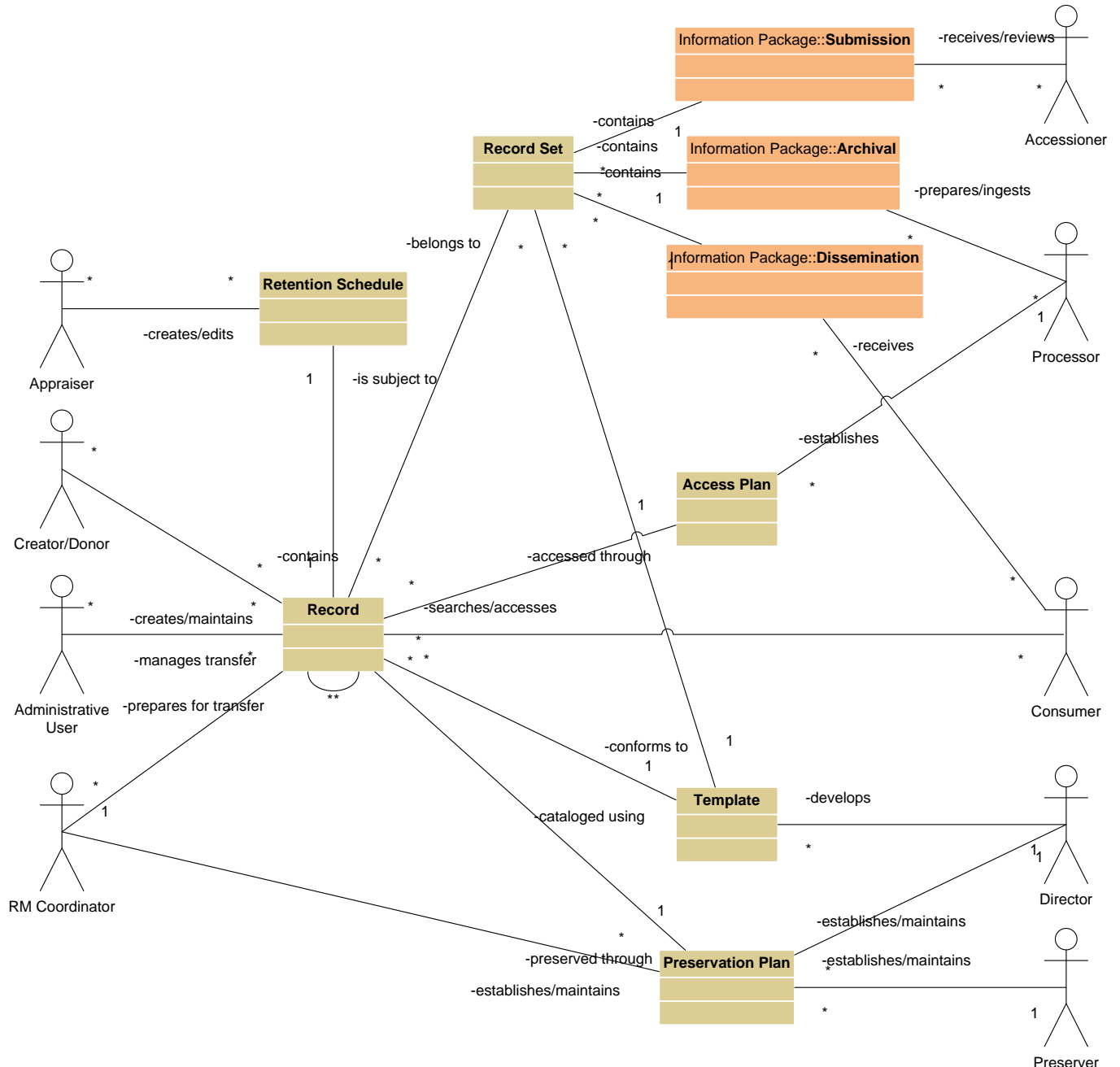
5.5.4 Other Involved Personnel

Other personnel who will not directly interact with the system but who will have an influence upon or will be influenced by the system include the MFAH Administration, Legal and Compliance Officer, Development department and Buildings and Grounds department.

5.6   Support Environment

The Support Environment would include the MFAH IT department for first-line troubleshooting as well as routine system maintenance and upgrades. The IT department will also play an important role in negotiating vendor contracts and support.

6.0   Operational Scenario

The *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 Transfer Scenario

Record creators/donors, appraisers/records managers, record management coordinators, and administrative users are all involved in the transferring process and are considered Transferring Entities.

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

- Accept electronic records from the Transferring Entity in electronic formats that conform to ERA collection policy
- 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

MFAH Archives 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 MFAH Archives' 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, MFAH Archives 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, and preservation planning decisions, technical limitations, and the record's conformance to a registered template

6.1.1 Transferring Entities

Transferring Entity users are Record creators/donors, Records managers/Appriasers, Record management coordinators, and Administrative users who create, receive, maintain, identify archival collections and transfer 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 Transfer Activities

1. The Appraiser/Records manager provides tools and guidance to Records creator/donor or Records management coordinator that aids in the preparation of SIPs.
- The Appraiser/Records manager develops records schedules, deeds of gift, or deposit agreements that include descriptions of sets of records, specific data about the records, and instructions on how they will be submitted the ERA.
- The Appraiser/Records manager works with the Record creators/donors, the Preserver, and the Archives manger to define the terms and conditions of transfer and to develop a Preservation and Access Plan, which indicates how MFAH Archives will preserve and provide required access to the records.
- The Records manager monitors any changes in record keeping or business requirements that would require a change in an approved retention schedule
- The Appraiser/Records manager defines templates for SIPs largely according to the nature and format of the records (such as textual document, moving image, recorded sound) as well as their provenance.   The Records manager accesses the ERA template repository to register/submit a new template; to create a

new template based on a deposit agreement, electronic record, or model template; or to modify an existing template.

- When preparing to transfer electronic records to MFAH Archives, the Records management coordinator prepares a manifest of the content data objects to be transferred.

- When preparing to transfer electronic records to MFAH Archives, the Records management coordinator identifies the appropriate template to be used in the transfer of records and completes the mandatory descriptive elements, identifying the essential characteristics of the records that accurately represent their content, context, structure, and presentation based on a core set of elements required by MFAH Archives as well as characteristics that are unique to records or the domain in which they were created. For certain records, the identification of these characteristics may be completed with less detail. Additionally, MFAH Archives staff acting as a Transferring Entity may identify such characteristics.

- The Records creator/donor or Records management coordinator indicates any specific requirements for retrieving the records after transfer, and stipulates any restrictions on access to the records after transfer. The Records creator/donor or Records management coordinator will flag records of a confidential nature. Information from the completed templates forms the basis for a Preservation and Access Plan for the records.

- For complex digital objects or unscheduled records, the Appraiser/Records manager may request access to the object or sample records for the purposes of appraisal and template development.

- Additionally, the Appraiser/Records manager makes available to the Records creator/donor a suitable mechanism for the transfer.

2. The Administrative user oversees the transfer of SIPs.

- The Administrative user will ensure that the integrity of the data objects will remain intact and linked to completed templates during the transfer of the SIP.

- The Administrative user will manage transfers, receiving and maintaining authorizations to transfer, monitoring volume of transfers, and scheduling timing of transfers with Records creator/donor or Records management coordinator and Accessioner.

- Using MFAH Archives 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., a user profile is created).

- The Administrative User will create and edit user groups. The Administrative User will set access permissions for user groups in accordance with MFAH I.T and Archives policies.

6.2   Accessioner Scenario

The following scenario outlines ERA's role in facilitating the interaction between the Transferring Entities and the ERA throughout the ingestion process. As described in the example below, the ERA will streamline the review and approval process, generate reports, generate metrics, and provide a reliable method of transfer between the Transferring Entity and MFAH Archives. Although this scenario presents a relatively high degree of MFAH Archives involvement with the Transferring Entity prior to transfer, it does not mean to suggest that ERA requires this level of interaction. In many instances, MFAH Archives 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, MFAH Archives staff will assume the role of Transferring Entity and use ERA to perform many of the Transferring Entity activities.

6.2.1   Accessioner

The Accessioner will work with the Transferring Entity to review SIPs. The Accessioner will reject SIPs for insufficient descriptive metadata and notify the Record creators or Records management coordinators. The Accessioner will reject SIPs for corruption of templates and/or records and notify the Administrative User. Will approve SIPs for ingestion into Archives.

6.2.2   Accessioning Activities

1. Review Submission ingestion package
- Checks that completed templates are associated with content data objects.
- Checks the template for conformance to MFAH Archives' 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 deposit agreements are rejected as invalid, ERA notifies the Transferring Entity that the documentation is in error.
- Using SIP manifests and checksums, the Accessioner verifies that all appropriate components of the transfer are included and that they are complete and uncorrupted. When the transfer has missing, incomplete, or corrupted components, or has replaced such items, the Accessioner notifies the Administrative User.
- Accessioner reviews content of SIP for personal identifying information, such as Social Security numbers or credit cards, using automated program(s).
- Notifies Donors and Records Processors of existence of personal identifying information.
2. Notify Transferring Entity and Processor of SIP's approval for ingestion
- After the SIP is approved, the Accessioner notifies the Transferring Entity of the approval of the SIP.
- After the SIP is approved, notifies the Records Processor that it is ready for ingestion into ERA.

6.3   Records Processor Scenario

This scenario presents an example of how a record processor might use ERA to ingest, arrange and describe SIPs. This example is not intended to account for all possible situations in this user class. The steps listed below should not necessarily be interpreted as a sequence of events.   In cases where the Transferring Entity no longer exists, MFAH Archives staff will serve as the Transferring Entity.

6.3.1   Records Processor

The records processor is engaged in administering the accession, verification, arrangement, and description of electronic records. The records processor interacts with Transferring Entities and with MFAH Archives management at various points in this scenario

6.3.2   Records Processor Activities

1.   Verification of SIP integrity and security review
- The Records processor uses such ERA tools as manifests and checksums to verify that all appropriate components of the transfer are included and that they are complete and uncorrupted. When the transferring has missing, incomplete, or corrupted components, or has replaced such items, the Records processor notifies the Accessioner.
- The Records processor checks the transferred electronic records against the specifications in the deposit agreement, deed of gift, Preservation and Access Plan, templates, and other documentation.
- 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.
- The Records processor will flag additional documents for confidentiality and will notify the Administrative user of additional access restrictions as required.
2. 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. MFAH Archives 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 or empirically on a web site; various arrangements are stored within the ERA system as templates. 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.
- Records processor obtains approval for new arrangement template from Archives manager and stores in ERA system.
- In some instances, the Records processor, with the approval of the Archives manager, will impose a new order, modifying relationships between records. This is anticipated for accruals of institutional records and donated collections. The Records processor will preserve the original order as well as the imposed order and will link arrangement templates as appropriate.

- The Records processor, with the approval of the Archives manager, will determine whether the SIP should be ingested as one or more AIPs. In instances when the SIP will be modified for ingestion, new checksums will be run.

3. Performs initial preservation actions

- 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.

- Runs report to ensure preservation actions and new preservation data, such as checksums for transformations, is documented in ERA system.

- The records processor reviews the preservation report and may consult with a preserver about any problems in the preservation report or test results.

4. Archival Description

- The Records processor chooses an ERA-stored metadata schema for the full description of the records based on the completed templates transferred with records, their format (e.g., textual, moving image, recorded sound) and contents.

- The Records processor uses ERA to create or enhance the description of the 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. 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.

- The records processor submits the completed draft description to the Archives manager for review and approval.

5. Ingestion

- Records processor ingests AIP in original and transformed versions, transferring onto archival servers. Runs reports to verify that contents not corrupted during transfer. Notifies Preserver of any problems.

- Ensures that link between original SIP and AIP(s) has been preserved.

- The Record processor assigns AIPs to appropriate access user groups.

- Tests retrieval of AIP against descriptive metadata as well as contents.

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 my MFAH Archives, 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 MFAH Archives can certify the authenticity of reproductions of electronic records. Preservation activities include:

- 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 MFAH Archives 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;
    o   Terms and conditions for transfer of electronic records to ERA,
    o   Standard templates and rules defining a record set's essential attributes that must be preserved,
    o   Standard methods for reproducing electronic records from their digital components,
    o   Conditions and standard methods for changing the formats of digital components of records when required for preservation and continuing access,
    o   Essential properties of the set and of any defined subsets within the set that must be preserved,
    o   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; and
- 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 MFAH Archives and IT 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 MFAH Archives' requirements. The preserver works closely with the Records manager/appraiser, Records processor, Administrative user and MFAH Archives manager 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 MFAH Archives, under a records schedule, deed of gift or deposit agreement, must have an associated Preservation and Access Plan which specifies how MFAH Archives will provide the storage, access, reproduction, or other services required. Each plan adopts MFAH Archives standards 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 in non-standard formats.
- 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 MFAH Archives to perform any required services for the set or the electronic records in it.
- The Preserver guides Transferring Entities and Records managers/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 to existing Preservation and Access plans.
- The Preserver receives sample records from Appraiser for review as needed for non-standard records.
- The Preserver works with Appraiser, Record Creator/Donor, and Archives Manager for development to formulate preservation plans for inclusion in deposit agreements for non-standard files or complex digital objects.
2. Maintenance of Electronic Records

- The preserver uses ERA to review transfers of records and the changes applies 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.

- 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 archival retention.

- 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 donors and the Archives manager, as needed, to transfer electronic records from the donor's system to ERA.

- 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 with such tools as checksums and corrected bit error rate of storage media in archive. The Preserver will utilize ERA tools to monitor media degradation, will migrate records to new media, and to recover electronic records from failed media if necessary.

- 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.

- The Preserver monitors changes in hardware and software for indications that they will no longer support data content objects. Makes timely recommendations for hardware and software replacements that will keep data content objects viable.

- The Preserver monitors the viability of emulators ingested into the system. Recommends alternatives to emulators that are in danger of obsolescence or that have been superseded with more functional programs.

6.5   Consumer Scenario

This scenario describes how the consumer will employ ERA to search for, access, and retrieve electronic records in accordance with pre-determined access levels. ERA will support search of descriptions of all records, and show defined relationships between the sets of 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.

6.5.1   Consumer

A consumer is any individual or organization who wishes to identify and/or obtain access to or copies of electronic records in the ERA. These individuals fall into four broad types.

- **Transferring Entity**, including department records creators, records officers, department resource managers, administrative staff, and others. A Transferring Entity has access to its own records which are in MFAH Archives' physical custody
- **MFAH Archives staff members**, including those MFAH Archives staff members that undertake access review, arrangement and description, order fulfillment, preservation activities, records management, reference services, system operations, and others. MFAH Archives staff constitutes a special class of consumers for records needed in the performance of their duties.
- **MFAH internal users,** including curators, education staff, docents, librarians and other staff engaged in scholarly research who wish to search and access electronic records relevant to their research
- **Public**, including authors, researchers, educators, genealogists, family and local historians, filmmakers, information service providers, interpreters, publishers, rights recipients, reporters and the media, scholars, state and local government personnel, professional organizations and their members, supporters' groups, foundations, donors of historical materials, students, and the general public.

6.5.2   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
- Consumers will be able to search and retrieve descriptions of records accessioned by MFAH Archives in accordance with pre-determined access levels. In addition, they will be able to search and retrieve electronic records which have no access restrictions that are maintained in ERA.
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, 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 a series or file unit. 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. Browse

- The Consumer will be able to view and browse records according to both the original file structure, and, if applicable, the imposed file structure.

4. 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 pre-determined access levels. 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 MFAH Archives staff.

5. Mediated Search Request

- The Consumer may request help from MFAH Archives staff while using ERA. A mediated request may include such activities as MFAH answering questions, conducting and handling searches, providing certified copies, processing special requests, expediting requests, and similar issues. 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.

6. Fee for Service

   Public consumers may request products that require them to pay a fee.

6.6 Management Scenario

This scenario is included to demonstrate the interaction of the MFAH Archives manager 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.

6.6.1 Managers

Managers are those users who are responsible for the overall operation of the ERA from a policy and procedural perspective and a technical one. The former responsibility lies with the Archives manager and the latter with the Administrative user. Archives managers making decisions related to the management of the ERA, processing activities, and assignment of personnel to perform the archival work as scheduled. The responsibility for the completion of archival tasks rests with the MFAH Archives manager. The MFAH Archives manager also interfaces with the administrative user when system problems disrupt the flow of work. The Administrative users are those that handle such activities scheduling reports, monitoring the system, modifying workflow, and ensuring system availability. The Administrative user, as the entity that will handle transfer or records from the creator to the Archives without data corruption, also has Transferring entity responsibilities. The Administrative user is an I.T. professional. 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.

6.6.2.1 MFAH Archives Manager Activities

1. Approval of retention schedules, deposit agreements and deeds of gift
- The Archives manager approves changes/additions to record retention schedules.
- The Archives manager takes legal custody of donated manuscript collections
- The Archives manager negotiates deposit agreements for digital objects falling outside of the MFAH Archival retention schedules or collection scope. It is expected that complex digital objects such as web-based art objects would fall into this category.
2. Approval and Closure of Processing
- The Archives manager approves all templates used for SIPs.
- The Archives manager approves arrangement templates.
- The Archives manager approves the ingestion of a SIP as one or more AIP(s).
- The Archives manager reviews and approves descriptive metadata.
- The Archives manager approves any modification to the original file structure.
- As the job progresses through the system, there are various junctures where the Archives manager's approval is required. The Archives manager will inspect jobs on a periodic basis and provide approval as appropriate, including final approval that the job has successfully been completed.
3. Modify Workflow
- The Archives manager will interface with the Administrative user or MFAH Archives staff to recommend possible solutions if bottlenecks occur in the processing and ingestion stages.
- The Archives manager will interface with the Administrative user or MFAH Archives staff to recommend possible solutions if bottlenecks occur in the retrieval of ERA contents.
4. Preservation planning
- The Archives manager will confer with Record creators/donors and the Administrative user to negotiate deposit agreements for non-standard formats.

- The Archives manager will approve all approve all Preservation and Access plans.
- The Archives manager will be notified of any instances of data degradation in data object or related content.
- The Archives manager will be notified of any unusual activity in the audit tracking logs.
- The Archives manager discusses with Preserver all emulators to be ingested into the ERA.

5. Administration

- The Archives manager receives and reviews scheduled reports from the Administrative user on the amount and type of ingestions, system capacity, the number and domain of public user requests, the total user requests and the materials retrieved.
- The Archives manager interfaces with the Administrative user regarding the creation and scheduling of other reports as needed.
- The Archives manager approves deletion of AIP(s) under the extenuating circumstance of deaccession from the MFAH or archival collection with MFAH Administration and/or trustee oversight.

6.6.2.2 *Administrative User Activities*

1. Assign user rights and privileges
   The Administrative user ensures that ERA users are granted appropriate access rights (e.g., ability to edit, input data, check security, produce user reports). Note that users with "public" access rights can be created by ERA.
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 MFAH Archives or a system monitoring need. The reports could provide metric data for such activities as system usage, system capacity, performance, or 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 Archives manager or are created on an as needed basis.
- The Administrative user modifies the scheduling and type of reporting at request of Archives manager.
3. Monitor System
- ERA provides the Administrative user with the ability to monitor system performance and security using system diagnostic tools that monitor storage, performance, space, load, security-related indicators, etc. The Administrative user receives and responds to system status alarms that indicate a system problem/fault or a potential security problem.
- The administrative user diagnoses and troubleshoots problems implementing intrusion detection system and virus control procedures. 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 MFAH Archives' records l 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 MFAH Archives manager, the Administrative user diagnoses and troubleshoots the problem, and temporarily modifies system workflow(s) to ensure continued service.

- The Administrative user notifies the appropriate MFAH Archives 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   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.

6.8.1   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.

6.8.2   Performance

The proposed ERA system should be scalable to one Exabyte of total storage and ten teraobjects without major design changes.

6.9   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 the MFAH archival program and its constituents. The sub-sections below identify potential operational impacts, organizational impacts, and impacts during development that should be considered as the MFAH develops plans for the proposed ERA system.

7.1 Operational Impacts

It is anticipated that the ERA will:

- Provide ready access to archival electronic records for the staff of the Archives, Administration, and other departments.
- Reduce the amount of data on the MFAH's active servers.
- Allow for quicker and more precise retrieval of electronic records.
- Enable researchers to access open archival holdings electronically.
- Automate procedures associated with traditional archival processes of appraisal, description and arrangement.
- Changes in operational budget
- Changes in operational staff needs
- Disaster or catastrophic recovery:
  o The size of the ERA holdings make full recovery of an archive's holdings expensive and time consuming
- Advances in technology, particularly as they pertain to analysis of unstructured data, will impact the ERA as it is developed
- 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
- Changes to operational procedures

7.2 Organizational Impacts

The MFAH is examining current policies and business practices and may have to develop and/or modify policies and business practices as necessary. The depth and breadth of the organizational impact is unknown at this time. Information with respect to the following has not been provided for this reason and includes such items as the numbers and skill levels of personnel needed for contingency operation at one (1) or more alternate sites following an emergency, disaster, or accident; and changes in the number of personnel, skill levels, position identifiers, or locations of personnel. ERA may also require the revision of position descriptions to reflect changes in the MFAH's business practices. With this in mind, the MFAH has identified a number of possible organizational impacts as provided below.

- An assessment of how ERA fits organizationally within the MFAH and relates to the MFAH
- program units
- The commitment of resources (e.g., funding, time, staff) by the MFAH and Transferring
- Entities to efforts to address electronic records needs
- The need for cross-functional, inter-disciplinary staff teams
- The development of education and increased training for both the MFAH staff and

- consumers
- Improved opportunities for career development for the MFAH staff
- An opportunity for other museums and non-profits to avail themselves of ERA
- technology for their own system design purposes
- Relationships between theMFAH and Transferring Entities

7.3   Impacts during Development

The full extent of impacts during development will not be known until completion of the systems analysis and design phase and as such has not been provided; however, impacts considered thus far include the following.

- 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.
- When known, information on impacts such as the following will be provided as required.
- Involvement in studies, meetings, and discussions prior to award of the contract;
- User and support involvement in reviews and demonstrations, evaluation of initial
- operating capabilities and evolving versions of the system, development or modification
- of databases, and required training;

8.0   Analysis of the Proposed System

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

8.1   Summary of Improvements

The proposed ERA system will provide a new set of capabilities as offered in **Section 4.2.2**. The full extent of the capabilities to be provided by the proposed ERA system will not be known until the completion of the systems analysis and design phase of the program and will be addressed at that time as required. It is anticipated however, that the proposed ERA system will offer numerous benefits to the MFAH and may include the following items.

- The preservation of electronic records that would otherwise be lost
- A wider variety of electronic records in the MFAH assets
- Consolidated electronic records administration and streamlined internal workflow
- More involvement with Transferring Entities
- New tools to support processing and access review of electronic records:
    - Tools to aid in access review decisions
    - Tools for withdrawal
    - 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
- Enhanced capabilities for searching electronic records

8.2   Disadvantages and Limitations

Potential disadvantages or limitations of the proposed ERA system include:

- High development costs,
- Staff anxiety brought about by new responsibilities resulting from changes due to electronic records,
- Impact on Transferring Entities (resources required to prepare for transfer of materials to THE MFAH, greater records management responsibilities), and
- User misunderstanding of ERA's relation to the MFAH's other electronic assets and systems.

8.3   Alternatives and Tradeoffs Considered

An alternative to the proposed ERA system would conceivably involve the voluntary transfer of archival records to MFAH Archives active server space or to an instance of D-Space. It would further involve negotiating disposition agreements with MFAH record creators utilizing database systems such as Millenium, Kronos and Fundware.

9.0   Notes

A project team—comprising the MFAH Archives director, chief technology officer, records manager, and director of IT and office services—will meet frequently (approximately two times per month) to discuss criteria and progress, and will attend workshops to guide the development of criteria for the ERA. The team will report to Willard Holmes (MFAH associate director, administration) who is responsible for museum operations, including attaining institution-wide policy and procedure compliance, and overseeing the MFAH Archives and IT, registrar, exhibit production, and guest services departments. This reporting structure assures ready discourse with the museum registrars and the MFAH policy and compliance administrator (a practicing attorney whose role includes providing legal support within the MFAH), whose participation—particularly in the case of the latter—is critical to the project. The involvement of Mr. Holmes—whose authority "cross[es] organizational boundaries and [is] concerned with the enterprise level"—sufficiently reflects the findings of the 2005-06 NHPRC-funded study on reporting requirements for effective electronic records management programs.[1] The Archives director will focus on researching guidelines and will create a bibliography of research materials extracted from the *Toolkit for Managing Electronic Sources*[2] by the National Archives and Records Administration (THE MFAH), and from guidelines and professional literature by the Library of Congress, the Smithsonian Institution, the Sedona Conference, InterPARES, ERPANET, and the Digital Preservation Testbed, The Hague. Online resources—such as the training materials developed by the Missouri Electronic Records Education and Training Initiative, the South Carolina Department of Archives and History, and the *Digital Preservation Management Workshop and Tutorial*—will also be consulted. Notes from these sources will be distributed to other project staff and will figure predominantly in the discussion of criteria for the ERA. Other members of the project team will focus on the assessment of institutional needs, and a preliminary exploration of both open source and commercial systems will be made; IT staff will investigate commercial options and the records manager will concentrate on open source systems. The latter will give particular attention to **i** Rule Oriented Data Systems (iRODS) and the development of Distributed Custodial Archival Preservation Environments (DCAPE). Additional requisites for the system will be determined, and previously identified requisites will be modified, as a result of staff research, participation in workshops, and ongoing institutional discussions.

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[1] Where Records Management Should Report: *A Study and Comparison of Industry and Government,* Carol E.B. Choksy, Ph.D. www.arma.org/pdf/journal/rmreporting.pdf
[2] http://toolkit.archives.gov/pls/htmldb/f?p=102:browsetools:16099197727628582171::::P14_LSTO:TITLE