

Hispanic Digital Archive

System and Software Requirements Definition (SSRD)

TEAM 5

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System and Software Requirements Definition (SSRD)

The SSRD specifies the requirements of the proposed system. The intended audience of this document is the client and the system architect. It forms a bridge between the client and the developer domains.

This document identifies the functional requirements of the Hispanic Digital Archive System. The requirements of the system in nominal and off-nominal situations are elaborated. The required behavioral properties of the system are also specified. This document helps the system architect to design the system such that it meets the client's expectations. It also helps in achieving a common understanding between the client and the developer about the system, its requirements and the constraints and the limitations within which it must be developed.

1 Introduction

1.1 Purpose of the Document

1. To identify the Project's requirements, the System's Functional requirements (both nominal and off-nominal)
2. To confirm the various stakeholders' concurrence on essentials
3. To identify the non-functional requirements: i.e., the behavioral properties that the specified functions must have, such as performance, usability, etc.
4. To identify the global constraints: requirements and constraints that apply to the system as a whole
5. The intended audience is the client

1.2 References

Operational Concept Description
System and Software Architecture Description
HDA Documentation Standard
Accusoft ImageGear ActiveX-LT 16/32 brochure
IBM Digital Library Install.pdf
Rational Rose 98
HDA WinWin Negotiations
Dublic Core Essentials - www.purl.org/dc

2 Capability Requirements

2.1 System Definition

The Hispanic Digital Archive System comprises of an administrator machine, archive machine and the client machines. The administrator machine has a scanner interface, admin module and IBM Digital Library Server. The operator and the manger can scan images by the scanner via the scanner interface. The administrator is authenticated by the admin module. The admin module determines the access rights and passes them to the IBM Digital Library server.

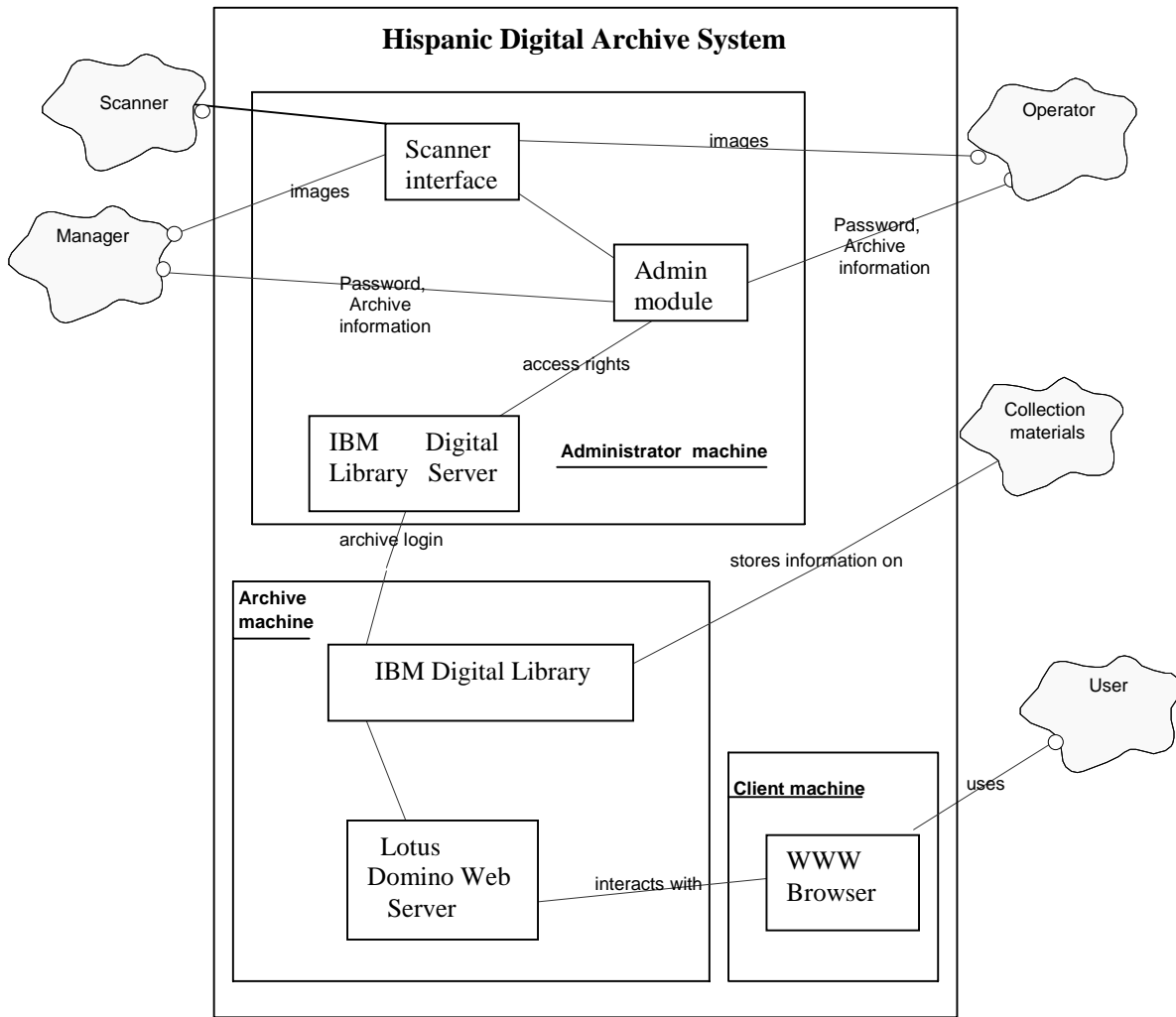


Fig. 1 System Block Diagram

The Hispanic Digital Archive consists of the following two subsystems:

1. Archive Administrative Subsystem - Mayordomo
2. Archive User Subsystem - Zaguán

1. Archive Administrative Subsystem

The Archive administrative subsystem allows the administrators to add new types of archive contents, to add, delete and modify the contents in the archive.

An initial archive for ten types of archive contents is created. A capability to modify the archive is provided. This subsystem allows the operator to add records to the archive without knowing much about the new item being archived. The subsystem thus allows ease of input of data and images in the archive.

The administrator needs to be able to enter data and images into the archive with minimal effort. This also includes basic edit functionality so that the archive is maintainable as well as flexibility in input of the data. This also includes help functionality. Also, the collections will change with time so the system should provide the capability to reflect these changes in the archive. This will help in providing the user with up to date information.

The Administrative subsystem shields the administrator (managers and operators) from learning various underlying formats of data and images. The Administrative Subsystem will have the following capabilities:

- ◆ **Administrator Authentication**
- ◆ **Adding new items, images, and content types to the archive**
- ◆ **Deleting items, images, and content types from the archive**
- ◆ **Modifying the contents of the archive**
- ◆ **Adding and deleting the choices of a given field element**
- ◆ **Generation of an item report**

2. Archive User Subsystem

The Archive user subsystem allows the user to search the archive for the archive items of their interest. The user is allowed to make request to the manager for the selected archive items. The manager will locate the items in advance. The user can borrow the items by coming to the library. This will save both the user's and administrator's time.

The users are allowed browse the archive if they are not sure of what they are looking for. The users may browse to get a fair idea about the HDA and its contents. The User Subsystem will do the following:

- ◆ **Allows finding archive items by browsing or by keyword**
- ◆ **View archive item information**
- ◆ **Saving, printing and emailing of archive item information**
- ◆ **Process archive item paging requests**
- ◆ **Provide online help**

2.2 Project Requirements

The following sections describe the project requirements:

1. Globally accessible archive collection

The objective is to make more people aware of the Hispanic Digital Archive. This would increase the usability of the system as people would be able to access the archive from their home, offices and from places far from the Boeckmann Center. The archive material could be made available to them either electronically or through inter-library loan.

2. Powerful yet simple tool

The system should be simple to use. The user desires quick and simple access to the pages and speedy searches. A user only has so much patience, and the system should be usable or it will not be utilized, thereby limiting access. The number of large graphics will be minimized, and slower modem connections will be used in testing.

3. Development Process

It should be possible to implement the project in 12 weeks. The development phase is split into 3 construction phases. The first construction phase, the preparation of the database, the administrator subsystem development and the user subsystem will begin in the month of February. The second construction phase will start on March 1st and end on April 4. It involves more work on the components of the system, and finally their integration. The third construction phase will go on from April 5 to April 19 1999. Here good-to have features would be added. The development phase will be followed by the transition phase that will last for 10 days. The project requirements for the development process are documented in the *Life Cycle Plan*.

4. HTML 3.2 Compliance

Zaguán should be compliant with HTML 3.2. That means that the user should be able to use Zaguán from a browser that supports HTML 3.2 at a minimum.

5. Extensible and scalable system

The system should be able to accommodate increasing content and provide new services and features without significant software breakage or rework.

2.3 System Requirements:

The Hispanic Digital Archive consists of the following two subsystems:

1. Administrative Subsystem

The administrative subsystem interacts with the administrator and performs administrator specific functions.

2. User Subsystem

The user subsystem interacts with the user and performs user-specific functions.

2.3.1 Nominal Requirements

2.3.1.1 Archive Administrative Subsystem

Requirement:	RQ-01
Function:	Administrator authentication.
Description:	The subsystem would provide two levels of access for the administrator, viz. Manager and Operator
Input(s):	<ul style="list-style-type: none"> Administrator's two letter initials code
Source(s):	Administrator terminal
Output(s):	<ul style="list-style-type: none"> Main screen for managing archive
Destination(s):	Administrator terminal
Precondition(s):	Administrator defined as an authorized user.
Postcondition(s):	The administrator is allowed to perform the functions allowed for that set of his/her privileges. Any other operation can only be performed after successfully completing this one.
Traceability:	[OCD SR- 05]
WinWin Agreement(s):	[eballew-AGRE-2]
Mainstream Scenario:	[OCD 5.2.1 SC-11]
Exception Handling Scenario:	[OCD 5.2.3 SC-17]

<i>Requirement:</i>	<i>RQ-02</i>
Function:	Add a new archive content type.
Description:	The subsystem shall allow the administrator to add the content types in the archive. This would allow the archive to evolve with time. To add new content types the administrator needs to specify the type template for the new type.
Input(s):	<ul style="list-style-type: none"> • Name of content type • Selection of the relevant field elements in the type template
Source(s):	Administrator terminal
Output(s):	<ul style="list-style-type: none"> • Type is added to the list of valid types
Destination(s):	Administrator terminal and Archive server.
Precondition(s):	Type with same name does not exist.
Postcondition(s):	Type name is added to the list of available types. When the type is selected, the field elements are enabled according to the associated type template
Traceability:	[OCD SR-05]
WinWin Agreement(s):	[sdy-AGRE-12]
Variant Scenario:	[OCD 5.2.2 SC-15]

<i>Requirement:</i>	<i>RQ-03</i>
Function:	Delete an existing archive content type.
Description:	The subsystem shall allow the administrator to delete existing content types in the archive. This would remove a predefined template but not affect the information in items.
Input(s):	<ul style="list-style-type: none"> • Content type selection • Confirmation of the delete operation
Source(s):	Administrator terminal
Output(s):	<ul style="list-style-type: none"> • The deleted content type would be removed from the archive.
Destination(s):	Administrator terminal and Archive server.
Precondition(s):	The archive content type must exist in order to be deleted.
Postcondition(s):	Name of content type is removed from list of available type templates.
Traceability:	[OCD SR-05]
WinWin Agreement(s):	[sdy-AGRE-12]
Variant Scenario:	[OCD 5.2.2 SC-15]

<i>Requirement:</i>	<i>RQ-04</i>
Function:	Modify an existing archive content type.
Description:	The subsystem shall allow the administrator to modify type template of existing content types in the archive.
Input(s):	<ul style="list-style-type: none"> • Name of content type • Selection of required field elements in the type template

Source(s):	Administrator terminal
Output(s):	<ul style="list-style-type: none"> Modified type is stored in the list of valid types
Destination(s):	Administrator terminal and Archive server
Precondition(s):	Type is defined before
Postcondition(s):	When the type is selected, the field elements are enabled according to the modified type template
Traceability:	[OCD SR-05]
WinWin Agreement(s):	[sdy-AGRE-12]
Variant Scenario:	[OCD 5.2.2 SC-15]

<i>Requirement:</i>	<i>RQ-05</i>
Function:	Add a new item to the HDA.
Description:	The subsystem shall allow the administrator to add items to HDA. To add new items the administrator needs to fill in a form containing information about the new item. is entered and the
Input(s):	<ul style="list-style-type: none"> Item information, [Record #, Location, Type, Language, Box #, Folder #, Item #, Title, Creator(s), Contributor, Country, Publisher, Date (e.g. of Publication), Relation, Collection, Description, Subject(s), Format, Resource Identifier, Source, Coverage, Rights Management] with at least the box, folder and item number for that type provided. Selection of the add operation.
Source(s):	Administrator terminal
Output(s):	<ul style="list-style-type: none"> The new item is added to the archive
Destination(s):	Archive server
Precondition(s):	When an item is being added, a check for the existence of that item is with the same Box #, Folder #, and Item # combination.
Postcondition(s):	The initials of the operator who created that item are stored along with the current date. Item is put into pending state, if administrator does not have manager privileges. The modification information is the same as creation information.
Traceability:	[OCD SR-05]
WinWin Agreement(s):	[sdy-AGRE-12]
Mainstream Scenario:	[OCD 5.2.1 SC-12]
Exception Handling Scenario:	[OCD 5.2.3 SC-18]

<i>Requirement:</i>	<i>RQ-06</i>
Function:	Delete items from the database.
Description:	The subsystem shall allow the administrator to delete existing items from the archive. To delete items the administrator needs to retrieve items and select items for deletion from the matching items.
Input(s):	<ul style="list-style-type: none"> Selected item(s) for deletion Selection of the delete operation Confirmation of delete operation
Source(s):	Administrator terminal

Output(s):	<ul style="list-style-type: none"> The selected items would be deleted from the database.
Destination(s):	Administrator terminal and Archive server
Precondition(s):	Administrator has manager privileges. The items to be deleted are retrieved from the archive before deleting.
Postcondition(s):	Deleted item removed from matching results list.
Traceability:	[OCD SR-05]
WinWin Agreement(s):	[sdy-AGRE-12]
Mainstream Scenario:	[OCD 5.2.1 SC-12]
Exception Handling Scenario:	[OCD 5.2.3 SC-15]
<i>Requirement:</i>	<i>RQ-07</i>
Function:	Modify existing archive items.
Description:	The subsystem shall allow the administrator to modify information on existing archive items. To modify information of the existing items, the administrator needs to retrieve items and select an item for modification from the matching items.
Input(s):	<ul style="list-style-type: none"> Selected items for deletion Selection of the delete operation
Source(s):	Administrator terminal
Output(s):	<ul style="list-style-type: none"> The information of the items in the archive would be modified.
Destination(s):	Archive server
Precondition(s):	The items to be deleted are retrieved from the archive before modification.
Postcondition(s):	The initials of the operator who modified that item are stored along with the current date. Item is put into pending state, if administrator does not have manager privileges.
Traceability:	[OCD SR-05]
WinWin Agreement(s):	[sdy-AGRE-10]
Mainstream Scenario:	[OCD 5.2.1 SC-12]
Exception Handling Scenario:	[OCD 5.2.3 SC-15]
<i>Requirement:</i>	<i>RQ-08</i>
Function:	Maintain field element options
Description:	The subsystem shall allow maintenance (add and delete) of the set of field element options. Field elements that can have predefined option list are <i>Relation</i> , <i>Country</i> , <i>Language</i> , <i>Format</i> and, <i>Location</i>
Input(s):	<ul style="list-style-type: none"> Selection of field element Option for that element Add or delete operation
Source(s):	Administrator terminal
Output(s):	<ul style="list-style-type: none"> Updated field element options list

Destination(s):	Administrator terminal and Archive server
Postcondition(s):	Field element options are updated
Traceability:	[OCD SR-05]
WinWin Agreement(s):	[sdy-AGRE-12]
Variant Scenario:	[OCD 5.2.2 SC-16]

<i>Requirement:</i>	<i>RQ-09</i>
Function:	Add images to an item
Description:	The administrator would be able to add images from externally stored image files in JPEG or GIF format only. The new image is stored along with an identifying title, which by default is “Untitled” Identical image titles are allowed.
Input(s):	<ul style="list-style-type: none"> • Path name of image to be added • Title for image (optional)
Source(s):	Administrator terminal
Output(s):	<ul style="list-style-type: none"> • Image is added to the current item at the end of the list. • The selected image is shown in the Image window. • Initials of the administrator and the current date are stored.
Destination(s):	Administrator terminal and Archive server.
Precondition(s):	The item has already been created Image is in GIF or JPG file format
Postcondition(s):	Thumbnail is condensed form of the first image of an item. Item is in pending state, if administrator does not have manager privileges. The TOC of images is in sync with images.
Traceability:	[OCD SR-02]
WinWin Agreement(s):	[fakharza-AGRE-6]
Mainstream Scenario:	[OCD 5.2.1 SC-14]
Variant Scenario:	[OCD 5.2.2 SC-5]
Exception Handling Scenario:	[OCD 5.2.3 SC-18]

<i>Requirement:</i>	<i>RQ-10</i>
Function:	Removing images from an item
Description:	An image can be removed from the archive.
Input(s):	<ul style="list-style-type: none"> • Selection of image for removal • Confirmation of delete operation
Source(s):	Administrator terminal
Output(s):	<ul style="list-style-type: none"> • Image is removed from the archive • TOC of image titles is updated • Initials of the administrator and the current date are stored.
Destination(s):	Archive server and administrator terminal
Precondition(s):	The item has been retrieved before. At least one image is associated with the item.
Postcondition(s):	Thumbnail is condensed form of the first image of an item. Item is in pending state, if administrator does not have manager privileges.

	The TOC of images is in sync with images.
Traceability:	[OCD SR-02]
WinWin Agreement(s):	[fakharza-AGRE-6]
Mainstream Scenario:	[OCD 5.2.1 SC-14]
Variant Scenario:	[OCD 5.2.2 SC-5]
Exception Handling Scenario:	[OCD 5.2.3 SC-18]

<i>Requirement:</i>	<i>RQ-11</i>
Function:	Modify the order of images
Description:	Images for an item can be reordered, in which case TOC of image titles would be updated and the its thumbnail of first image would replace the existing one.
Input(s):	<ul style="list-style-type: none"> • Selection of image to be reordered • Selection of up or down action
Source(s):	Administrator terminal
Output(s):	<ul style="list-style-type: none"> • Image is reordered in the list of images. • Initials of the administrator and the current date are stored.
Destination(s):	Archive server and Administrator terminal
Precondition(s):	The item has been retrieved before. Two images for the item exist.
Postcondition(s):	Item is put into pending state, if administrator does not have manager privileges. The thumbnail is a condensed form of the first image. TOC of image titles is in sync with image order.
Traceability:	[OCD SR-02]
WinWin Agreement(s):	[fakharza-AGRE-6]
Mainstream Scenario:	[OCD 5.2.1 SC-14]
Variant Scenario:	[OCD 5.2.2 SC-5]
Exception Handling Scenario:	[OCD 5.2.3 SC-18]

<i>Requirement:</i>	<i>RQ-12</i>
Function:	Modify approval state of item.
Description:	The manager must approve the additions and modifications made by the operator to the archive database. When an item is added or modified, the item is placed in a pending state. A bulk status modification is allowed. When an item is marked as approved, it becomes available to the public.
Input(s):	<ul style="list-style-type: none"> • Selected items for deletion • Selection of the status toggle operation
Source(s):	Administrator terminal
Output(s):	<ul style="list-style-type: none"> • The state of the selected items in the archive would be modified.
Destination(s):	Archive server
Precondition(s):	Administrator has Manager privileges The items to be deleted are retrieved from the archive before

	modification.
Postcondition(s):	The state of item is toggled.
Traceability:	[OCD SR-05]
WinWin Agreement(s):	[eballev-AGRE-2]
Mainstream Scenario:	[OCD 5.2.1 SC-12]
Variant Scenario:	[OCD 5.2.2 SC-15]
Exception Handling Scenario:	[OCD 5.2.3 SC-14]

<i>Requirement:</i>	<i>RQ-13</i>
Function:	Scan image into Archive
Description:	The administrator can perform the scan operation directly from Mayordomo, the standard scanner user interface would be brought up to complete the operation. Once scanning is completed, the image is directly stored in the IBM Digital Library. Default title is "Untitled"
Input(s):	<ul style="list-style-type: none"> • Scan operation selection • Title for image (optional)
Source(s):	Administrator terminal
Output(s):	<ul style="list-style-type: none"> • Image is added to the current item at the end of the list. • The scanned image is shown in the Image window. • Initials of the administrator and the current date are stored.
Destination(s):	Administrator terminal and Archive server.
Precondition(s):	<ul style="list-style-type: none"> • A TWAIN compliant scanner is installed on the terminal
Postcondition(s):	Thumbnail is condensed form of the first image of an item. Item is in pending state, if administrator does not have manager privileges. The TOC of images is in sync with images.
Traceability:	[OCD SR-05]
WinWin Agreement(s):	[sdy-AGRE-12]
Mainstream Scenario:	[OCD 5.2.1 SC-09]
Exception Handling Scenario:	[OCD 5.2.1 SC-15]

<i>Requirement:</i>	<i>RQ-14</i>
Function:	Watermarking images
Description:	A watermark can be applied to an existing image in the archive directly from Mayordomo.
Input(s):	<ul style="list-style-type: none"> • Selection of image
Source(s):	Administrator terminal
Output(s):	<ul style="list-style-type: none"> • The watermarked image is shown in the Image window. • Initials of the administrator and the current date are stored.
Destination(s):	Archive Database and Administrator terminal

Precondition(s):	Image has been added to the archive
Postcondition(s):	The initials of the operator who watermarked the image are stored along with the current date. Item is put into pending state, if administrator does not have manager privileges. The thumbnail is a condensed form of the first image.
Traceability:	[OCD SR-01]
WinWin Agreement(s):	[sdy-AGRE-12]
Mainstream Scenario:	[OCD 5.2.1 SC-14]

<i>Requirement:</i>	<i>RQ-15</i>
Function:	View item and print details
Description:	Items can be retrieved for viewing or printing. Items are first retrieved based on certain search criteria and a selection is made for printing or viewing. Only textual information for an item is printed.
Input(s):	<ul style="list-style-type: none"> Any or all of Title, Publisher, Location, Type, Box, Folder Item #s Selection of item(s)
Source(s):	Administrator terminal
Output(s):	<ul style="list-style-type: none"> Details of item on the form or Item report for all selected item(s) generated in a text file and displayed in an editor tool. The item information would be printed in the following order: Record #, Location, Type, Language, Box #, Folder #, Item #, Title, Creator (1, 2, 3), Contributor, Country, Publisher, Date, Collection, Relation, Description, Subject(1, 2, 3), Format, Identifier, Source, Coverage, and Rights Management, Created by, Created on, Last modified by, Last Modified on
Destination(s):	Administrator terminal
Postcondition(s):	Items in the report are in an ascending order of their titles. When multiple items are selected, the first item is displayed.
Traceability:	[OCD SR-02]
WinWin Agreement(s):	[sdy-AGRE-12]
Mainstream Scenario:	[OCD 5.2.1 SC-12]

<i>Requirement:</i>	<i>RQ-16</i>
Function:	User access manager
Description:	This allows for the addition of a new administrator either as an operator or a Manager to Mayordomo. The user is defined one of either Manager or Operator or No privileges.
Input(s):	<ul style="list-style-type: none"> Administrator's initials Administrator's full name Administrator's privilege level
Source(s):	Administrator terminal

Output(s):	<ul style="list-style-type: none"> The new user's information would be stored
Destination(s):	Archive server
Precondition(s):	Defining administrator has manager privileges. An administrator with the same initials does not exist.
Postcondition(s):	The new administrator is allowed to login immediately after the record is created.
Traceability:	[OCD SR-04]
WinWin Agreement(s):	[sdy-AGRE-10]

<i>Requirement:</i>	<i>RQ-17</i>
Function:	Change the details for an administrator
Description:	An administrator having manager privileges can change the privilege level or full name of an administrator. A complete list of all the defined administrators can be viewed
Input(s):	<ul style="list-style-type: none"> Selected administrator Administrator's new full name (optional) Administrator's new privilege level (optional)
Source(s):	Administrator terminal
Output(s):	<ul style="list-style-type: none"> The modified administrator information would be stored
Destination(s):	Archive server
Precondition(s):	Defining administrator has manager privileges. An administrator with the same initials does not exist.
Postcondition(s):	The initials of the administrator remain unchanged and the administrator's record is not removed, only modified. The change takes effect immediately, but currently logged in administrator's privileges remain unchanged.
Traceability:	[OCD SR-04]
WinWin Agreement(s):	[sdy-AGRE-12]

<i>Requirement:</i>	<i>RQ-18</i>
Function:	Context-related help on Mayordomo
Description:	There would need to be context-related help on Mayordomo. Such help would describe a given window for which it applies.
Input(s):	<ul style="list-style-type: none"> Invocation of help from Mayordomo Screen for which help is required
Source(s):	Administrator terminal
Output(s):	<ul style="list-style-type: none"> Help on the screen and the functionality associated with the use of that screen.
Destination(s):	Administrator terminal
Traceability:	[OCD SR-06]
WinWin Agreement(s):	[sdy-AGRE-12]

Support Scenario(s):	[OCD 5.2.4 SC-19]
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<i>Requirement:</i>	<i>RQ-19</i>
Function:	Splash screen
Description:	Upon loading up of Mayordomo, a splash screen would appear that identifies the software.
Output(s):	<ul style="list-style-type: none"> • Mayordomo splash screen
Destination(s):	Administrator terminal
Postcondition(s):	The application provides a way for the administrator to authorize oneself.
Traceability:	[OCD SR-06]
WinWin Agreement(s):	[sdy-AGRE-12]
Mainstream Scenario:	[OCD 5.2.1 SC-11]

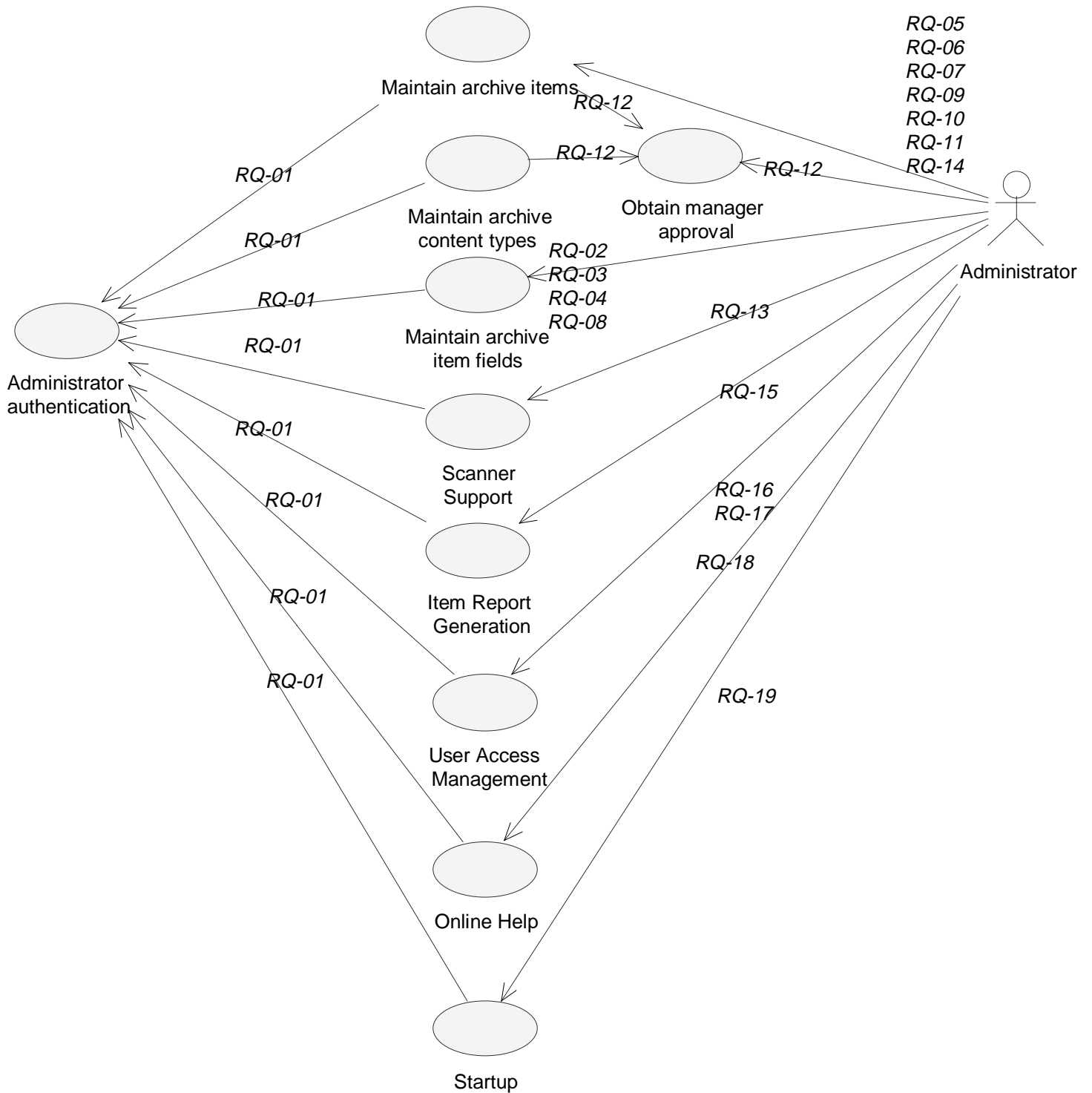


Fig. 2 Archive Administrative Subsystem

2.3.1.2 Archive User Subsystem

<i>Requirement:</i>	<i>RQ-20</i>
Function:	Search archive
Description:	The user should be allowed to find an item by searching for keywords. Search is defined as keyword entry and selection of AND/OR semantics if multiple words are used. The search applies to the entire archive and fields searched are description, subjects, title, creators, country, language and date.
Input(s):	<ul style="list-style-type: none"> • Keyword(s) • AND/OR selection
Source(s):	Patron terminal
Output(s):	<ul style="list-style-type: none"> • List of matching archive items in a summary format.
Destination(s):	Archive server and Patron terminal
Precondition(s):	A null search means searching for nothing is not allowed. Search only looks for approved items in the archive.
Postcondition(s):	No more than 10 items are displayed to the user. In case the user asks for the next list of matching items, the next 10 matching items should be shown.
Relates To:	[OCD SR-02]
WinWin Agreement(s):	[nrm-AGRE-7]
Mainstream Scenario:	[OCD 5.1.1 SC-03]
Exception Handling Scenario:	[OCD 5.1.3 SC-07]
<i>Requirement:</i>	<i>RQ-21</i>
Function:	Browse archive
Description:	Browse allows navigation by identifying the major list of options. Thus, those field elements that have options can be used to browse. This includes <i>Relation</i> , <i>Type</i> , <i>Country</i> , and <i>Language</i> .
Input(s):	Any or all of the following choices <ul style="list-style-type: none"> • Relation • Type • Country • Language
Source(s):	Patron terminal
Output(s):	<ul style="list-style-type: none"> • List of matching archive items in a summary format.
Destination(s):	Archive server and Patron terminal
Precondition(s):	Browse only applies to currently approved items in the archive. Browse is only possible on the available browse categories for each <i>Relation</i>
Postcondition(s):	No more than 10 items are displayed to the user. In case the user asks for the next list of matching items, the next 10 matching items should be shown.
Relates To:	[OCD SR-02]
WinWin	[nrm-AGRE-7]

Agreement(s):	
Variant Scenario:	[OCD 5.1.2 SC-6]
<i>Requirement:</i>	<i>RQ-22</i>
Function:	View item information
Description:	The Archive user subsystem allows the user to view the details of a selected archive item.
Input(s):	<ul style="list-style-type: none"> Selected archive item
Source(s):	Patron terminal
Output(s):	<ul style="list-style-type: none"> Thumbnail image for the item Type, Language, Title, Creator (1, 2, 3), Contributor, Country, Publisher, Date, Collection, Relation, Description, Subject(1, 2, 3), Format, Identifier, Source, Coverage, and Rights Management as applicable. TOC of images with direct links to the images
Destination(s):	Archive server and Patron terminal
Precondition(s):	The user has performed a search by keyword or has browsed the archive and more than one item was listed in the matching results.
Postcondition(s):	The patron can navigate back to the list of results
Relates To:	[OCD SR-02]
WinWin Agreement(s):	[nrm-AGRE-7]
Mainstream Scenario:	[OCD 5.1.1 SC-03]
Exception Handling Scenario:	[OCD 5.1.3 SC-07]
<i>Requirement:</i>	<i>RQ-23</i>
Function:	View item images
Description:	An image related to an item along with its title and links to go back to the item description or previous or next image in sequence is shown.
Input(s):	<ul style="list-style-type: none"> Selected archive item
Source(s):	Patron terminal
Output(s):	<ul style="list-style-type: none"> Image associated with item Links to the previous and next image as applicable Link to the item detail description
Destination(s):	Archive server and Patron terminal
Precondition(s):	The user has viewed detailed information of the item
Postcondition(s):	The patron can navigate back to the item description and to previous and next image of the item.
Relates To:	[OCD SR-02]
WinWin Agreement(s):	[nrm-AGRE-7]
Mainstream Scenario:	[OCD 5.1.1 SC-03]
Exception Handling Scenario:	[OCD 5.1.3 SC-07]

Handling Scenario:	
<i>Requirement:</i>	<i>RQ-24</i>
Function:	Page request
Description:	Selected archive items can be paged for retrieval from the archive storage.
Input(s):	<ul style="list-style-type: none"> List of Selected archive items E-mail address of requestor Date of pickup
Source(s):	Patron terminal
Output(s):	<ul style="list-style-type: none"> Confirmation of request submission An email to the administrator containing Box #, Folder #, Item #, location and Title of requested items
Destination(s):	Administrator terminal and Patron terminal
Precondition(s):	The selected archive items are not to exceed 5 per request. Pickup date should be more than one business day after current date.
Postcondition(s):	Paging request is delivered to the administrator.
Relates To:	[OCD SR-03]
WinWin Agreements:	[sdy-AGRE-12]
Variant Scenario:	[OCD 5.1.2 SC-04]

<i>Requirement:</i>	<i>RQ-25</i>
Function:	Online help for patrons
Description:	The user subsystem provides an online help on all the features and terminology including search, browse, paging request, and e-mail request.
Input(s):	<ul style="list-style-type: none"> Help request Help context
Source(s):	Patron terminal
Output(s):	<ul style="list-style-type: none"> Guidance on use of features for that context
Destination(s):	Patron terminal
Precondition(s):	The page contains terminology requiring assistance
Postcondition(s):	The patron can navigate back to the context in which help was requested
Relates To:	[OCD SR-03]
WinWin Agreement(s):	[eballew-AGRE-1]
Support Scenario:	[OCD 5.2.1 SC-16]

<i>Requirement:</i>	<i>RQ-26</i>
Function:	Emailing archive item.
Description:	The patron can ask the detailed item information to be emailed. Any number of selected items can be e-mailed to the user listed in the order of request. This e-mail is sent to the requestor.
Input(s):	<ul style="list-style-type: none"> • List of Selected archive items • E-mail address of requestor
Source(s):	Patron terminal
Output(s):	<ul style="list-style-type: none"> • Details of item in the following order • Type, Language, Title, Creator (1, 2, 3), Contributor, Country, Publisher, Date, Collection, Relation, Description, Subject(1, 2, 3), Format, Identifier, Source, Coverage, and Rights Management as applicable.
Destination(s):	Patron terminal and Archive server
Precondition(s):	The email address provided by patron is valid and reachable.
Postcondition(s):	The email would not be stored or tracked on the archive server.
Relates To:	[OCD SR-02]
WinWin Agreement(s):	[sdy-AGRE-12]
Variant Scenario:	[OCD 5.1.2 SC-04]

<i>Requirement:</i>	<i>RQ-27</i>
Function:	Printing item descriptions
Description:	The patron can print item descriptions as well as images one at a time.
Input(s):	<ul style="list-style-type: none"> • Either selected Item or selected image • Printing location • Printing format
Source(s):	Patron terminal
Output(s):	<ul style="list-style-type: none"> • Printed Item information or image
Destination(s):	Patron terminal
Precondition(s):	The printing location is valid
Relates To:	[OCD SR-02]
WinWin Agreement(s):	[sdy-AGRE-12]
Variant Scenario:	[OCD 5.1.2 SC-03]

<i>Requirement:</i>	<i>RQ-28</i>
Function:	Bookmarking the item
Description:	The patron should be able to store a list of selected items in the form of a bookmark for viewing later on.
Input(s):	Item description to be bookmarked
Source(s):	Patron terminal
Output(s):	<ul style="list-style-type: none"> • Bookmark of item description location
Postcondition(s):	The bookmark remains valid only if its state remains unchanged
Destination(s):	Patron terminal
Relates To:	[OCD SR-02]
WinWin Agreement(s):	[sdy-AGRE-12]
Variant Scenario:	[OCD 5.1.2 SC-05]

<i>Requirement:</i>	<i>RQ-29</i>
Function:	Acknowledgements and Overview
Description:	Acknowledgement information and an overview on Zaguán would be provided.
Input(s):	<ul style="list-style-type: none"> • User request for viewing acknowledgements or overview
Source(s):	Patron terminal
Output(s):	<ul style="list-style-type: none"> • Pages with acknowledgement or overview information
Destination(s):	Patron terminal and Archive server
Relates To:	[OCD SR-02]
WinWin Agreement(s):	[sdy-AGRE-12]
Variant Scenario:	[OCD 5.1.2 SC-05]

<i>Requirement:</i>	<i>RQ-30</i>
Function:	Logos, e-mail and contact information
Description:	A means of initializing the archive system with logos, e-mail and contact information would need to be established.
Input(s):	<ul style="list-style-type: none"> - Logos - e-mail address - other contact information
Source(s):	Database
Output(s):	<ul style="list-style-type: none"> - Pages with logos, e-mail and contact information
Destination(s):	Patron
Relates To:	[OCD SR-02]
WinWin Agreement(s):	[sdy-AGRE-12]
Variant Scenario:	[OCD 5.1.2 SC-04]

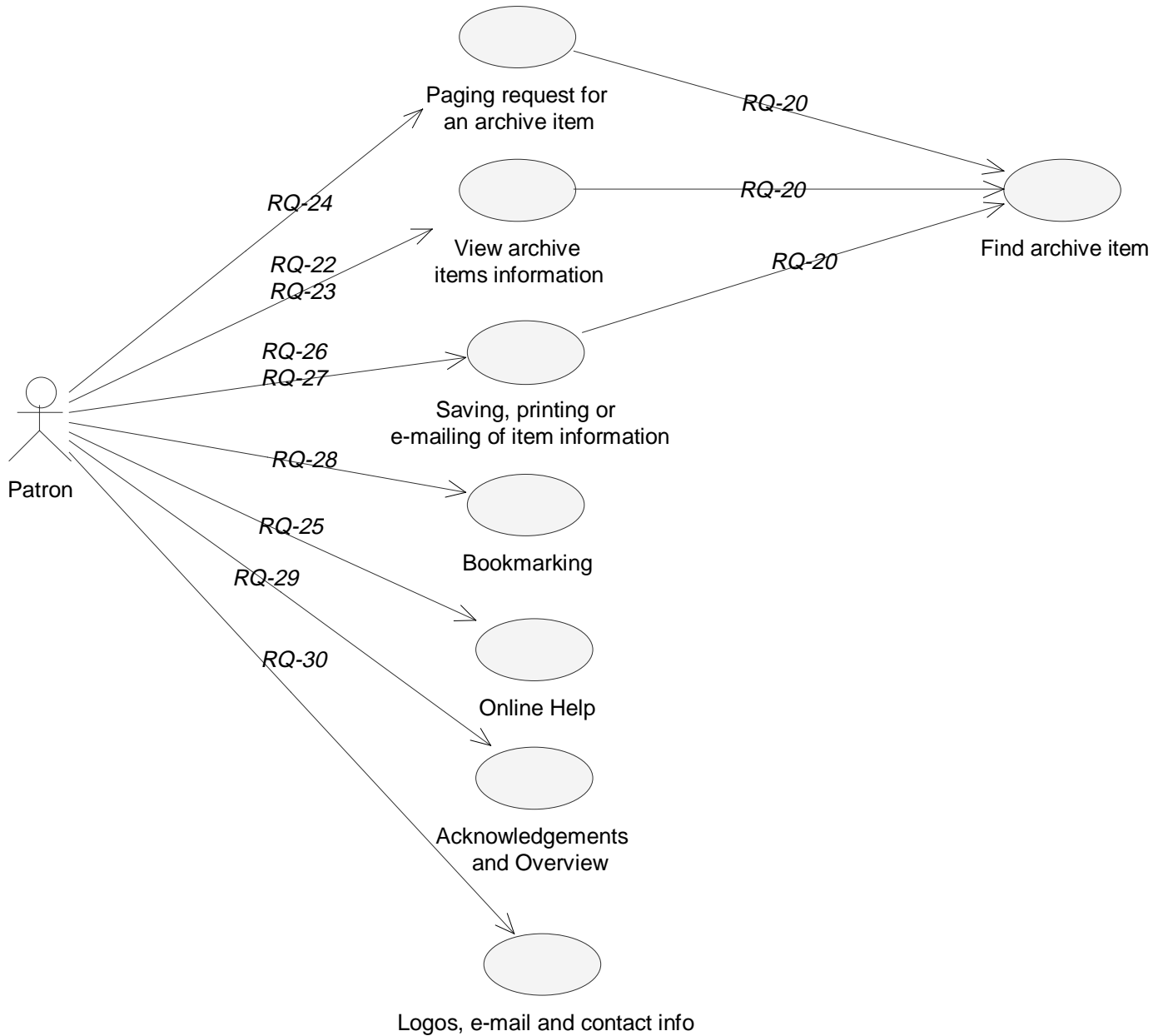


Fig. 3 Archive User Subsystem

2.3.2 Off-Nominal Requirements

1. If the search results exceed 1000 hits, then the system should prompt the user to refine their query instead of attempting to return all search results, which make take a very long time to process, or may overload the client machine
2. No matching items in the archive

The user searches the database. The user selects search criteria that do not match any item in the database. A page is displayed to the user that tells there are no matches in the database. The user may go back to the search with the browser navigation button. This is only an information page.

3. The administrator authentication fails

The user enters the wrong password at the time of the administrator authentication. The system will respond with a denial of access. The user may enter the password again.

3 Quality Attribute Requirements

3.1 Dependability/Fault-Tolerance

Requirement:	QR-01
Specific:	Availability
Description:	Maintenance of the system is performed during the weekly 2-hour download time when changes are updated to the DBMS. Monitoring the system attributes such as disk space, concurrent users, and data integrity are performed so that DBMS administrators can perform fixes if needed.
Relevant:	The administrator can carry out backups by taking the archive offline for a short period and then allowing access to the archive after backup is completed.
Measurable:	It should be verified if backups can be made within 2 hours. This must be carried out at least four times so as to take care of the various workloads at different times.
Achievable:	Updates are made online. Hence making updates does not take time. However, backups take time. A backup of 2000 items would take 5 minutes. Thus for all 50,000 items, 2 hours would be required. [FRD 2.2.3.1]

3.2 Security

3.2.1 Privacy/Confidentiality

Requirement:	QR-02
Specific:	Privacy/Confidentiality
Description:	The archived information should not be lost due to malicious or unintended use of the system.
Relevant:	Manager and operator privileges are separately defined. The manager can delete items from the archive, add new administrators into the system and change information of administrators. Patrons are not allowed to modify the information in the archive. They can only view the archive contents.
Measurable:	Test the privileges of the two administrator tasks and verify that an administrator of Operator privilege is not allowed to carry tasks of Manager privilege.
Achievable:	IBM Digital Library allows Java-based system administration for authorizing user access to the system. This feature can be used to achieve this requirement [FRD 2.2.3.2].

3.2.2 Integrity

Requirement:	QR-03
Specific:	Integrity
Description:	Up-to-date and accurate archive information must be available to patrons.
Relevant:	An approval system is designed so that every addition or modification of item information goes through the Manager before being made available to the public.
Measurable:	The administrator should add items at the Operator privilege level and it should be verified that this item is not available to the public for viewing.
Achievable:	In IBM digital library the patrons would only see the approved items after verification by the manager [FRD 2.2.3.2].

3.3 Usability

3.3.1 Ease of Learning

Requirement:	QR-04
Specific:	Ease of Learning
Description:	The Administrator should be able to use all features of the HDA soon after reading the user's manual or being trained by accredited personnel.
Relevant:	The ease of learning would help in increasing the usability of the system.
Measurable:	It should be verified if the administrator is able to use HDA software within 2 hours of reading the manual and training.
Achievable:	The Online Help and User Manual will be developed in consultation with the client to determine the amount of help provided [FRD 2.2.3.3]

3.3.2 Ease of Use

Requirement:	QR-05
Specific:	Ease of Use
Description:	The Administrator should be able to effectively use the Administrative subsystem, that the Administrator should be easily able to add, delete database contents and modify the database. The user should be able to effectively search for the required archive items.
Relevant:	The ease of use would help the administrator to effectively use the system and the patron to effectively search the archive. An easy to use system is used more and would thus increase the awareness among the people about HDA.
Measurable:	Number of keystrokes per item should be least for each operation of the administrator and the patrons.
Achievable:	Usability of Mayordomo will be tested by potential users and administrators to determine its ease of use. [FRD 2.2.3.3]

3.3.3 Help requirements

Requirement:	QR-06
Specific:	User and Administrator Help
Description:	The HDA system should provide on-line help manual. This would help the users to search for the archive items and the Administrator to add, delete database contents and modify the database.
Relevant:	The help manual would assist the administrator to maintain the archive and the user to effectively search the archive. This would make the system easy to use.
Measurable:	20 Tests should be conducted wherein prospective users, such as those doing Latin American Studies use the system. Each test should address a different functionality of the system. It should be monitored if these people can use the system easily with the help manual.
Achievable:	The help manuals for the users can be provided [FRD 2.2.3.3]

3.4 Performance

3.4.1 Response Time

Requirement:	QR-07
Specific:	Response Time
Description:	The HDA system should be able to respond to the user search by keyword within 10 seconds, e.g. Searching the database for all the items that have the keyword in the title, author name, descriptor, and notes.
Relevant:	If the system does not respond to a search within a short time the user's interest would wane gradually. This could affect the usability of the system adversely.
Measurable:	100 searches must be conducted wherein it should be verified if the system can respond within 10 seconds.
Achievable:	The support of heterogeneous servers in IBM digital library allows you to use the system

	for all kinds of data, while optimizing the processing of individual data types. This would in turn reduce the response time for a search request. Also, the support for multiple, distributed object servers allows digital objects to be placed close to the users who need to access these objects frequently. This helps in delivering large multimedia objects (like images) fast [FRD 2.2.3.4].
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3.4.2 Network Bandwidth Usage

Requirement:	QR-08
Specific:	Network bandwidth Usage
Description:	The HDA system shall achieve fast download times over a regular modem connection (33.6Kbps modem): at no point, the User should wait for more than 15 seconds for an image to download as long as the Administrator uses small image files (less than 1008 Kbytes).
Relevant:	If the images take too long to download the user's interest would wane. This could affect the usability of the system adversely.
Measurable:	50 images of various sizes should be tested and it should be verified that they do not take more than 15 seconds to download.
Achievable:	An average user of the HDA system is expected to have a 33.6 KBPS modem. This is enough for the images to download in 15 seconds [FRD 2.2.3.4].

3.5 Portability

Requirement:	QR-09
Specific:	Portability
Description:	The HDA user subsystem shall be portable to any operating system and hardware platforms that work with the Netscape Navigator 4.x or Internet Explorer 4.x
Relevant:	The portability of the front-end would increase the availability of the system.
Measurable:	The system should be used on all the platforms as mentioned above and all system functions should be verified for correct operation.
Achievable:	Digital Library APIs can be used to provide access to HDA through any Web Browser using HTTP [FRD 2.2.3.5]

3.6 Reusability

Requirement:	QR-10
Specific:	Reusability
Description:	The HDA system shall be reusable for other digital archives. It will be generic enough to make the creation of Archive database and searching the database easy.
Relevant:	If the system can be reused for other archives it will save time and will be economical also.
Achievable:	The content type tag fields allow the user to select the content types for items. Thus content types tailored to the new digital archive could be created. Items and item fields specific to the archive could be added to the collection by the add item and add item field options respectively. Thus a new database with a schema customized for the archive could be created [FRD 2.2.3.6]

3.7 Compatibility

3.7.1 Legality

Requirement:	QR-11
Specific:	Legality

Description:	The system will prevent unauthorized use of USC owned digital contents of the archive.
Relevant:	If the HDA allows unauthorized use of images and other data that infringes with existing copyrights or pending legislation, then there may be lawsuits.
Achievable:	The Digital Library provides the capability of watermarking. This protects intellectual property from unauthorized use [FRD 2.2.3.7].

4 System Interface Requirements

4.1 User Interfaces

The HDA subsystem provides three kinds of interfaces:

1. Graphical User Interface(s)
2. Application Programming Interface(s)
3. Diagnostics

4.1.1 Graphical User Interface(s)

A graphical User Interface is provided to allow the user to search for archive items and view the search results. This user interface is shown in detail in [OCD 5].

4.2 Hardware Interfaces

The system would require a usable scanner interface and a scanner. This interface would allow usage of TWAIN compliant scanners. As a future possibility, scanning may be replaced by microfilming. Here the images will be microfilmed and the CD-ROM on which the images are stored are read to extract the images.

4.3 Other Software Interfaces

4.3.1 External Interface Requirements

The system would use bitmaps or equivalent digitized image file format obtained through scanner software. These images would then be stored in the archive and displayed to the users.

4.3.2 Internal Interface requirements

net.data scripting language

Net.data is provided by IBM Digital Library. It can be used as an alternative to CGI. It is specifically meant for accessing database over the Internet.

DLDPB (Digital Library Dynamic Page Builder)

It is a scripting language that can be used to construct a web page in response to a HTML request and it can use Java/CGI program to access the database besides the Digital Library APIs.

4.3.3 Internal Data requirements

Accusoft ImageGear 98 ActiveX LT (Tiff to Gif image conversion software)

It is an ActiveX supported component used to convert images to gif and jpeg format. Accusoft ImageGear 98 ActiveX LT (TIFF to GIF and JPEG image conversion software)

DB2 database

DB2 database is a part of IBM Digital Library. DB2 uses standard SQL for query statements.

5 Environment and Data Requirements

5.1 Operating Assumptions

1. Basic World Wide Web knowledge

Patrons of the Hispanic Digital Archive system should have basic World Wide Web knowledge: navigate using buttons and hyperlinks. Users should also have a basic working knowledge of a Web browser (e.g., Back button). The Digital Archive will be easy to use, but basics such as reaching the URL must be known by the users.

2. Users making retrieval requests do not make unnecessary requests

Users of the Hispanic Digital Archive system will be responsible enough not to make unnecessary requests for retrieval. However an item being requested may have a lot of related volumes. The administrator will bring in all the volumes. In the retrieval request the patron could request a particular volume by specifying the volume number in the notes field of the retrieval request form.

3. The managers must have rudimentary computer experience to use the system. However, the manager must have intermediate to expert knowledge of the library materials. For example, the manager will be responsible for adding new types. The managers will also be trained to use and administer the HDA system.

4. The operators must have basic computer knowledge to input the data. They will be trained to perform item archival.

5.2 Design and Construction Constraints

The usage of the new capabilities will involve the users, the managers, and the operators. The policies and requirements for the users include:

Additional policies and constraints concerning hardware or software include:

1. The ISO personnel would have to perform regular updates to the archive database, since ISD policy does not allow a direct update on the database.

2. The assumption is that there will be 8 operators working 10 hours per week per operator, 2 PC's, and 1 manager. With additional operators more managers will be needed. This is described in detail in [FRD 2.1.2]

3. The workstations for the data entry and verification will be PC's with 64 MB RAM and color displays. These workstations must also be connected to a minimum 600 dpi scanner and have scanner software.

4. The administrator would only be able to create new types using the fields developed for the system. In case any further functionality is required, the software would have to be enhanced.

The hardware and software requirements are described in more detail in [SSRD 5.3.2].

5.2.1 Tools

1. Use of IBM Digital Library

The HDA system shall be designed and developed with IBM Digital Library. ISD uses the IBM Digital Library, which consists of a DBMS in addition to add-ons allowing for GUI data access.

2. Use of Netscape 4.x or Internet Explorer 4.x

The HDA system shall be designed to work with Netscape 4.x and Internet Explorer 4.x.

5.2.2 Programming Languages

Standards Compliance

The search results generated by HDA system shall follow the HTML 3.2 guidelines, supported by Microsoft Internet Explorer 4.x, and Netscape Communicator 4.x.

5.2.3 Computer Resource Requirements

5.2.3.1 Hardware Requirements

The use of the IBM digital library solution introduces the following hardware requirements:

Servers

- IBM RS/6000
- 128 MB RAM
- 2.4 GB hard disk drive
- CD-ROM drive (for installation only)
- VGA display and adapter
- IP Address & Internet Connectivity (T1 quality)
- Network adapter (if components are installed on multiple workstations)

Clients (Administrators)

- Intel Pentium processor
- 32 MB of RAM is required
- CD-ROM drive (for installation only)
- 60 MB of hard disk space for installed product
- VGA display and adapter
- 800 x 600 display resolution
- Network Adapter (if components are installed on multiple workstations)
- These workstations must also be connected to a minimum 600 dpi scanner.

5.2.3.2 Software Requirements

Servers

- AIX version 4.2 and DB2 for AIX
- Digital Library 2.01 Library servers with Net.Data & Object Server

Clients (Administrator)

- One of the following:
 - Windows 95
 - Windows 98
 - Windows NT workstation Version 4.0 or later
 - Windows NT server Version 4.0 or later
- IBM Digital Library 2.01 Client for Windows
- These workstations must have TWAIN compliant scanner software.

5.2.3.3 Computer Communications Requirements

The Administrator should be able to transfer the HDA archive files images files generated by HDA system to the HTTP server running the HDA web site. The Administrator should have write access to a directory on the HTTP server, with read permissions for the entire world.

5.3 Packaging Requirements

Standalone Application

The HDA system shall be packaged along with all required third-party tools including but not restricted to IBM digital Library.

Implementation Requirements

The Administrator will create and maintain the HDA database. Then, the administrator will be trained to fully understand the functionality of the HDA system. An installation manual will be provided to the

administrator. This would assist the administrator in installing the system and in recovering from minor faults.

6 Evolution Requirements

6.1 Capability Evolution

The following changes considered but not included are candidates for implementation in the next release of the Hispanic Digital Archive System.

1. Data input using Speech processing

One proposed feature that has not been kept in the system design is one of voice recognition. In future, when voice recognition is available the system should allow the operator to simply speak the data that has to be entered and the database should be accordingly modified. For this an interface has to be provided.

2. Different levels of access to the archive (subscription)

In future, different levels of access to the archive items could be provided to the user. This would allow a set of users to have a wider access to items that could not have been archived otherwise. Also, the Boeckmann Center would get funds for its maintenance.

3. To provide the patrons of the HDA system with the capability to view the site and the search results in international languages.

The system currently allows the user to view the site and the search results in English only. A future capability would be to allow the user to view the site and the search results in Spanish. As most of the collection in the Hispanic Digital Archive is in Spanish it would increase the usability of the system. However it is not possible to provide this functionality in 12 weeks of IOC. In future, this functionality may be implemented.

4. User Profile Management

It would have been useful to monitor the profiles of the users accessing the web-site. This would help in making suitable modifications to the system to enhance its usability. In order to provide this functionality use of CGI is required which would not be according to CGI standards.

5. Generation of complex archive reports

Three reports would be useful generate for the administrator. A statistical report wherein the total number of records in the archive will be computed and a report will be generated to that effect. A work report would tell the number of records added, deleted and modified by each operator. A collection report would tell the volumes for a specific archive item that are present in the collection.

6. Provide a list of related resources:

A list of related resources is provided. If a patron cannot find a specific item or wishes to get additional information, a list of related resources would prove to be of immense help.

6.2 Interface Evolution

1. Integrated Scanner interface

Scanner interface will become simpler and cheaper. It will become possible to scan more items and more information on the archive material can be stored in the database. It should allow direct scanning from within the HDA administrative subsystem.

2. Easier Patron Interface

The patrons should be able to navigate back and forth between item descriptions.

3. Interface to SIRSI-Homer

Provide a link to Zaguán (HDA) from SIRSI-Homer.

6.3 Technology Evolution

As a future capability, the system should provide an interface for a jukebox. Once the utility of providing images and text files is proven the option of providing audio archive materials can be explored. Also, in future the system should support streaming audio and video.

7 Common Definition Language for Requirements

Administration

Performing maintenance on the system.

Archive

Collection of a variety of media and anthologies. Also known as Hispanic Digital Archive or HDA.

Collection

An organization of literature and other materials either donated by a specific person or pertaining to a specific subject

Context-related help

This help describes the help for a given context. For example, this kind of help would describe a screen, its contents, and its use.

Customer

Interchangeably used with Ms. Barbara Robinson the chief of Boeckmann Center.

Dublin Core

The Dublin Core is a metadata element set intended to facilitate discovery of electronic resources.

DL Dynamic Page Builder (DPB)

IBM Digital LibraryMacro scripting language for generating web pages on the fly using Net.Data.

Field element

An information unit for digital objects and archived information. E.g. Creator, Format, Title

HDA

HDA is Hispanic Digital Archive.

Homer

A library cataloging system used by the USC Libraries.

HTML

Hypertext Markup Language

Hyperlink

Hyperlink is a link from one web document to another document. It is generally highlighted or underlined on the web document and can be activated by clicking on it.

IBM Digital Library

The IBM Digital Library provides leading edge technology to maximize the value of information and multimedia assets while protecting the intellectual property.

Java

The Java programming language

Keyword

It is a word or a group of words used to search for a specific archive material. It is a word that is directly related to the material that the user is searching for.

Maintainable

A measure of flexibility and adaptability of the system.

Manual

It is the training manual that is provided by the developers. It assists the users in using the system and recovering from small problems.

Multiplatform

Multiplatform refers to the quality of being able to be installed and run on more than one platform (combination of hardware and operating system). An example platform is Wintel (Windows operating system and Intel processor).

Navigation

This term refers to going from one web page to the other by clicking on the hyperlinks.

Net.Data

Enables Internet access to relational data including DB2 on many platforms including AIX and NT.

Page(s)

This refers to web sites. The site is a web page. So when the user refers to pages this means a web page.

Paging request

A request to retrieve an archived item identified by its location and title, from storage area.

Profile

It is the information provided by the users about themselves. It includes their name and contact information and the research interests.

Search Criteria

Basis on which the requested material will be searched for.

Site

The WWW location where the system is accessed from all over the world.

TOC of images

The list of titles of images associated with an item.

Thumbnail

A condensed image with a maximum width of 120 pixels and height of 200 pixels maintaining the aspect ratio.

TWAIN

TWAIN is an industry standard interface for scanners. Scanners conforming to this standard provide API for interface and control of the scanner.

Type template

A checklist of relevant field elements for an item type. The field elements are Record #, Location, Type, Language, Box #, Folder #, Item #, Title, Creator(s), Contributor, Country, Publisher, Date (e.g. of Publication), Relation, Description, Subject(s), Format, Resource Identifier, Source, Coverage, Rights Management

Usability

This is the idea that the system is able to be used easily and intuitively by the target user.

User Interface

This is the part of the system, physical and visual, with which the user interacts to manipulate the system. Depending on the context, it is often simply referred to as the interface, but it must be differentiated from the system interfaces.

Web authoring tool

A Web authoring tool is used to design web pages. Examples of Web authoring tools are Netscape Composer, Microsoft FrontPage, Adobe PageMill, and Claris Homepage.

World Wide Web

An interconnection of computers for sharing information.