Requirements Specification

SJSU Online Library System

November 20, 2001

Joel Frank, Project Manager (Sections V and VI)
Hours Worked:

Signature

Valerie Stanton, Software Engineer (Sections III and IV)
Hours Worked:

Signature

Dani Sablan Chalmers, Software Engineer (Sections I and II)
Hours Worked:

Signature
# Table of Contents

I  INTRODUCTION 3

   SCOPE AND PURPOSE 3
   OVERALL SYSTEM DESCRIPTION 3
   SOFTWARE PROJECT CONSTRAINTS 3
   STRUCTURE OF DOCUMENT 3

II  SYSTEM ARCHITECTURE 5

III  INFORMATION DESCRIPTION 7

   ENTITY RELATIONSHIP DIAGRAMS 7
   DATA FLOW DIAGRAMS 9

IV  FUNCTION DESCRIPTION 18

   FUNCTIONAL PARTITIONING 18
   FUNCTIONAL DESCRIPTION 18

V  NAVIGATION FLOW AND BEHAVIOR DESCRIPTION 22

   NAVIGATION FLOW 22

VI  VALIDATION AND CRITERIA 30

   PERFORMANCE BOUNDS 30
   CLASSES OF TESTS 30

VII  BIBLIOGRAPHY 31

VIII  APPENDIX 32

   MAJOR FUNCTION SUMMARY 32
I Introduction

Scope and Purpose

This document covers the requirements needed for a successful Online Library System. These requirements have been specified by the customer and have been validated by the project manager. The documentation will provide a basis for the system design stage.

Overall System Description

This system will allow students and faculty to access SJSU's library system remotely via the internet, as well as through the library's local area network (LAN). Students and faculty will login by providing their user name, ID and PIN. Once logged in, students and faculty can perform media searches, reserve media, check their account status, and pay late due fees (if needed). Library staff will have all student/faculty account options as well as implementing check-in/check-out functions, user account modification, and database report generation. Administrative personnel will have access to all levels of user functions including the following additional database maintenance functions: top-level user account modification, user access control, and top-level database modification. The administrator will be able to logon via the LAN connection or will be able to logon to the actual server. As account management, the administrator can update, create, or delete student, library staff, or administrator accounts.

The system will provide an interface tailored to each user type.

Software Project Constraints

- Administrator interface must run on Windows 98 or a more current operating system
- Student interface must support Internet Explorer 5.0 and up
- Student interface must support Netscape Navigator 5.0, or Netscape Communicator 4.0 and up
- The database and application server must run on Windows 2000 on a Dell Poweredge 8450 as outlined in the project plan

Structure of Document

System Architecture
- This section contains the diagrams representing the architecture context (simple and detailed views), as well as the architecture flow.

Information Description
- This section includes the Entity Relationships Diagrams describing the relationships between the various user accounts and throughout the complete system. The Data Flow Diagrams for the whole system are also included.

Function Description
- This section includes the diagram for functional partitioning, as well as detailed descriptions for each level of functions.
Behavior Description
• This section has detailed state diagrams for students, faculty, library staff, and the administrator. Each diagram is followed with tables explaining the associated Events and Actions.

Validation and Criteria
• This section includes the performance bounds, the classes of tests that will be performed, and any other special considerations.
II  System Architecture

Figure 1: Architecture Context Diagram

Figure 2: Architecture Context Diagram (Detailed View)
Figure 3: Architecture Flow Diagram
III Information Description

Entity Relationship Diagrams

Figure 4: Entity Relationship Diagram - User Accounts

The data object USER ACCOUNT contains four types of users: STUDENT, FACULTY, LIBRARY STAFF, and ADMINISTRATOR. All of these accounts type have an inheritance relationship with the USER ACCOUNT data object.
MEDIA RESOURCES is the central data object and has objects related by both inheritance and association. The data objects BOOKS, MAGAZINES PERIODICALS, and MULTI-MEDIA are all types of MEDIA RESOURCES (inheritance). All other data objects are related to MEDIA RESOURCES by association.
Data Flow Diagrams

When examining an existing information system or analyzing the information that is going to be designed, it is important to recognize what the data is, where the data comes from, how it passes from one point to another within the information system, and how it will be used by the intended audience or user. The following data flow diagrams (DFDs) represent the movement of data within the system. They concentrate less on the actual functions and data constructs of programmers and more on the general processes inherent to the overall system. We started at the top of the system and moved deeper into the processes to the underlying database tables. The amount of detail specified in this document will include a level two representation for most functions and a level three where necessary.

All diagrams include references to additional levels when applicable. Expanded functions are referenced using numbered tabs, which provide the corresponding diagram number.
LEVEL 3
Diagram 4
Media Reservation

Display Confirmation
Flag

Media Reservation
Select Resource

Database
Flag

User Emailed when Resource is Available

LEVEL 2
Diagram 5
Account Status Check

Check Status Menu

Menu Selection
User ID Display Type

Display Results
Results

Database

Media Reservation

LEVEL 3
Diagram 4
Media Reservation

Display Confirmation
Flag

Media Reservation
Select Resource

Database
Flag

User Emailed when Resource is Available

LEVEL 2
Diagram 5
Account Status Check

Check Status Menu

Menu Selection
User ID Display Type

Display Results
Results

Database

Media Reservation

LEVEL 3
Diagram 4
Media Reservation

Display Confirmation
Flag

Media Reservation
Select Resource

Database
Flag

User Emailed when Resource is Available

LEVEL 2
Diagram 5
Account Status Check

Check Status Menu

Menu Selection
User ID Display Type

Display Results
Results

Database

Media Reservation

LEVEL 3
Diagram 4
Media Reservation

Display Confirmation
Flag

Media Reservation
Select Resource

Database
Flag

User Emailed when Resource is Available

LEVEL 2
Diagram 5
Account Status Check

Check Status Menu

Menu Selection
User ID Display Type

Display Results
Results

Database

Media Reservation

LEVEL 3
Diagram 4
Media Reservation

Display Confirmation
Flag

Media Reservation
Select Resource

Database
Flag

User Emailed when Resource is Available

LEVEL 2
Diagram 5
Account Status Check

Check Status Menu

Menu Selection
User ID Display Type

Display Results
Results

Database

Media Reservation
LEVEL 1
Diagram 9
Library Staff Login

From Level 0
Internet Browser/LAN Connection

Library Staff Login

User Name
User ID
PIN

Verification
User Type

Display
Main Menu

Menu Selection

Database

User Account Setup

User Info

User Account

Media
Checkin/Checkout

Resource Index No.

Resource Status
Change

Report Generation

Query

Report

Menu Selection

LEVEL 2
Diagram 10
User Account Set-up

User Account Set-up Menu

Menu Selection

Update User Account

Flag

User ID
User Info

Delete User Account

Flag

User ID
User Info

Create User Account

Flag

User ID
User Info

Database

Menu Selection

User Info

Flag

User ID
User Type

Menu Selection

Report Generation

Query

Report
LEVEL 1
Diagram 13
Administrator Login

From Level 0
Internet Browser/LAN Connection

Administrator Login

User Name
User ID
PIN

Verification
User Type

User ID
User Type

Display Main Menu

Menu Selection

Database

Media Management

Resource Info

Update Menu

Resource Info

Level of Access

Access Control

User Info

Account Management

User Info

User Account

LEVEL 2
Diagram 14
Media Management

Update Media

Add New Media Resource

Delete Media

Index No.
Resource Info

Index No.
Resource Info

Flag

Flag

Menu Selection

Menu Selection

Menu Selection

Database
LEVEL 3
Diagram 15
Media Addition

1. Add New Media Resource
2. Database
3. Assign Unique Index No.

LEVEL 2
Diagram 16
Access Control

1. Display Error
2. Verification Failure
3. User Info
4. User Verification
5. Access Control
6. Display Main Menu

- Allow Student/Faculty Level Access
- Allow Library Staff Level Access
- Allow Administrator Level Access

Return to Login
LEVEL 2
Diagram 17
Account Management

Staff Account Set-up Menu

Update Staff Account
Flag
Staff ID Staff Info

Delete Staff Account
Flag
Staff ID Staff Info

Create Staff Account
Flag

Database

Menu Selection

Menu Selection

Menu Selection

Menu Selection
IV Function Description

Functional Partitioning

Figure 6: Tree Diagram with Horizontal and Vertical Partitioning

Functional Description

Login Function (Shared Function)
This function is both for security and to control the user's level of access. This function requires the user's name, ID, and PIN. The user type is managed by the access control function. The system will verify that the user name, ID, and PIN are all correct before allowing access to the online library system. If the information is not correct, the user will receive an error message requesting that the user try again. With a correct login, the user will be taken to the appropriate menu. The student and faculty users will be able to login from any machine using an internet browser or from within the library using the LAN connection. The library staff will login via the library's LAN. The administrator will be able to login via the LAN connection or, for data management operations, the administrator will be able to logon to the actual server. Access time for account validation and determination of user access is expected to be no more than one second via the LAN connection and no more than five seconds using a remote internet browser. This time will be longer on older machines with slower modem speeds.

Media Search Function (Shared Function)
The media search function will search the media database for books, magazines/periodicals, and multi-media. The user can search for a book by title, author, subject, or ISBN. Magazines and periodicals can be searched by publication and issue date only. A separate system is already in place for specific article searches and will not be linked to the main online library system. Multi-media searches can be performed either by title or subject. This function will return and display all items that match the query criteria. Access time for this function is expected to
be no more than three seconds via the LAN connection and no more than ten seconds using a remote internet browser. This time will be longer on older machines with slower modem speeds.

Media Reservation Function (Student/Faculty Function)
The media reservation function allows the user to reserve media resources that are currently checked out. When the user performs a search, the availability information for the resource will also be displayed. The screen will display the resource status, the expected availability date, and if the book is already on reserve for another student or faculty member. The user will have the option to reserve the resource by selecting the reserve resource field. The student will automatically be notified by email when the resource is available. Only books and multi-media will be accessible for reservation. Magazines and periodicals can only be viewed in the library and are not available for check out. A student will not be allowed to have more than ten resources on reserve at one time. An error message will be displayed if the user tries to exceed this limit. Faculty may have up to 25 resources on hold. Access time for this function is expected to be no more than three seconds via the LAN connection and no more than ten seconds using a remote internet browser. This time will be longer on older machines with slower modem speeds.

Account Status Check Function (Student/Faculty Function)
The account status check will allow users to check the status of their library account. When this function is selected it will provide the following three options: view all resources currently checked out by the user, all resources on reserve, and a check for overdue fee. If the user selects resources borrowed, the title of each resource and the respective due date will be displayed. The resources reserved option will provide each title reserved by the user including the expected availability date. Only student accounts will include an overdue fee check; overdue fees will not be assessed for faculty. If the student selects this option, there will be an option to pay overdue fees online with a credit card (see overdue fee payment function). Access time for this function is expected to be no more than three seconds via the LAN connection and no more than ten seconds using a remote internet browser. This time will be longer on older machines with slower modem speeds. Times may also be slower for credit card payments as the credit card must be verified through the banking system.

Overdue Fee Payment Function (Student Function)
Students will be able to pay any overdue fees that may have been assessed using the overdue fee payment function. The user’s balance will be displayed when this function is selected along with a button labeled [pay fees]. The user will be prompted for a credit number, expiration date, and the name on the card. The user will then submit the request, which will be processed using an online banking system. The bank will verify the user's information and return verification of the transaction once it has been approved. An error message will be displayed if the payment cannot be processed. The account balance field will be updated immediately. The time for this function will vary depending on the volume of transactions being processed through the online banking system, but the maximum transaction time is not expected to exceed 10 seconds.

User Account Set-up Function (Library Staff and Administrator Function)
Both library staff members and the system administrator will have access to this function, although most student and faculty accounts will be set up by the library staff. There are three subfunctions: account update, account creation, and account deletion. The menu will display
these three options and the staff member will make the appropriate selection. The screen will display fields for the user’s name, ID, PIN, user type, address, email address, and phone number. The user will be given a default PIN and then prompted by the system for a new PIN on the first login. After the new account information has been entered, the staff member will click UPDATE button. If the account is being deleted, the staff member will select the DELETE button and the system will require verification that the account should really be deleted before it will be permanently removed from the system. Access time for this function is expected to be no more than two seconds via the LAN connection.

Media Check in/Check out Functions (Library Staff Function)
The checkin/checkout functions will be performed by the library staff. All resources are identified in the database by a unique index number. This number will be entered to select the media resource. When checking out a resource, the availability status will change, the student/faculty member ID number will be assigned to the resource, and a due date assigned. There is a limit to the number of resources that can be checked out to a single user at any given time. The students are limited to 10 media resources while the faculty can check out up to 25 media resources. Checking a book in will result in a change to the availability status and the association with the student/faculty member will be removed. If the resource has been reserved, an email will be generated with the availability status change. Access time for this function is expected to be no more than two seconds via the LAN connection.

Report Generation Function (Library Staff and Administrator Function)
Both the library staff and administrator will be able to generate a variety of pre-defined status reports as well as customized reports. The report function will include a complete resource status report, a listing of all user accounts, and a list of all overdue fees owed. Reports may also be generated using any combination of the search fields. The time required to generate reports is expected to be no more than ten seconds via the LAN connection.

Media Management Function (Administrator Function)
Managing the media will include adding new resources to the database, updating resources already in the database, and deleting resources. When adding a new resource to the database, the system will automatically assign it a unique index number. This number will be used for the checkin/checkout function to identify the media resource. The administrator will have direct access to the database server and will perform most media management functions while logged onto this server. This will result in immediate response times.

Access Control Function (Administrator Function)
The administrator will control the level of access for each type of user. Upon user login, the user type will identify the level of access and trigger the appropriate menu display. The user account validation will also be managed through this function. If the user name, user ID, and PIN can not be verified by the system, the user will be returned to the login screen and an error message will be displayed. If the user inputs an incorrect password on more than three consecutive attempts, the access control function will disable the account. Reinstatement of the account will require the assistance of a library staff member or the administrator. The administrator will have direct access to the database server and will perform most media management functions while logged onto this server. This will result in immediate response times.
Account Management Function (Administrator Function)

All user accounts will be managed by the administrator. Although the library staff may set up student/faculty accounts, only the administrator may set up library staff accounts and other administrator accounts. There are three subfunctions: account update, account creation, and account deletion. The menu will display these three options and the administrator will make the appropriate selection. The screen will display fields for the library staff member’s name, ID, PIN, user type, extension, position, and email address. The staff member will be given a default PIN and then prompted by the system for a new PIN on the first login. After the new account information has been entered, the administrator will click UPDATE button. If the account is being deleted, the administrator will select the DELETE button and the system will require verification that the account should really be deleted before it will be permanently removed from the system. The administrator will have direct access to the database server and will perform most media management functions while logged onto this server. This will result in immediate response times.
V  Navigation Flow and Behavior Description

Navigation Flow

Student Diagram

Events and Actions

<table>
<thead>
<tr>
<th>Current State</th>
<th>Event</th>
<th>Input</th>
<th>Action</th>
<th>Next State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display Login Menu</td>
<td>Login</td>
<td>UserID and Password</td>
<td>Validate Login</td>
<td>If login fails, loop to current state. Else Display Main Menu</td>
</tr>
<tr>
<td>Display Main Menu</td>
<td>Menu</td>
<td>Menu Selection</td>
<td>Output Selection</td>
<td>Selected State</td>
</tr>
<tr>
<td>Current State</td>
<td>Event</td>
<td>Input</td>
<td>Action</td>
<td>Next State</td>
</tr>
<tr>
<td>-------------------------</td>
<td>-------------</td>
<td>---------------------------</td>
<td>------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Display Media Search Menu</td>
<td>Media Search</td>
<td>Search Parameters or Return Request</td>
<td>Query Database using user defined parameters</td>
<td>Display media info resulting from query, or return to Display Main Menu</td>
</tr>
<tr>
<td>Display Media Info</td>
<td>Menu</td>
<td>Menu Selection</td>
<td>If reserve request, update database.</td>
<td>Reserve Confirmation, or return to Display Media Search Menu</td>
</tr>
<tr>
<td>Display Media Reserve Menu</td>
<td>Reserve</td>
<td>Input Media Parameters</td>
<td>Update database to reflect user’s request to reserve media</td>
<td>Reserve Confirmation, or return to Display Reserve Media Menu</td>
</tr>
<tr>
<td>Reserve Confirmation</td>
<td>Menu</td>
<td>Menu Selection</td>
<td>Output Selection</td>
<td>Display Reserve Media Menu, or return to Display Main Menu</td>
</tr>
<tr>
<td>Display Account Info Menu</td>
<td>Menu</td>
<td>Menu Selection</td>
<td>Output Selection</td>
<td>Selected Page</td>
</tr>
<tr>
<td>Display Reserved Media</td>
<td>Get Reserved List</td>
<td>No Input</td>
<td>Query database for user’s reserved media list</td>
<td>Return to Display Account Info Menu upon return request</td>
</tr>
<tr>
<td>Display Checked Out Media</td>
<td>Get Checked Out List</td>
<td>No Input</td>
<td>Query database for user’s checked out list</td>
<td>Return to Display Account Info Menu upon return request</td>
</tr>
<tr>
<td>Display Payment Menu</td>
<td>Menu</td>
<td>Menu Selection</td>
<td>Output selection to banking system</td>
<td>Banking System</td>
</tr>
<tr>
<td>Banking System</td>
<td>Payment validation</td>
<td>User’s payment parameters</td>
<td>Validate user’s payment parameters</td>
<td>If success, Update Balance. Else, return to Display Payment Menu</td>
</tr>
<tr>
<td>Update Balance</td>
<td>Update Balance</td>
<td>Confirmation code from banking system</td>
<td>Update account database to reflect user’s payment</td>
<td>Display Account Info Menu</td>
</tr>
</tbody>
</table>
Faculty Diagram

Events and Actions

<table>
<thead>
<tr>
<th>Current State</th>
<th>Event</th>
<th>Input</th>
<th>Action</th>
<th>Next State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display Login Menu</td>
<td>Login</td>
<td>User ID and Password</td>
<td>Validate Login</td>
<td>If login fails, loop to current state. Else Display Main Menu</td>
</tr>
<tr>
<td>Display Main Menu</td>
<td>Menu</td>
<td>Menu Selection</td>
<td>Output Selection</td>
<td>Selected State</td>
</tr>
<tr>
<td>Display Media Search Menu</td>
<td>Media Search</td>
<td>Search Parameters or Return Request</td>
<td>Query Database using user defined parameters</td>
<td>Display media info resulting from query, or return to Display Main Menu.</td>
</tr>
<tr>
<td>Display Media Info</td>
<td>Menu</td>
<td>Menu Selection</td>
<td>If reserve request, update database.</td>
<td>Reserve Confirmation, or return to Display Media Search Menu</td>
</tr>
<tr>
<td>Current State</td>
<td>Event</td>
<td>Input</td>
<td>Action</td>
<td>Next State</td>
</tr>
<tr>
<td>---------------------</td>
<td>---------------</td>
<td>------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Display Media</td>
<td>Reserve</td>
<td>Input Media Parameters</td>
<td>Update database to reflect user's request to reserve media</td>
<td>Reserve Confirmation, or return to Display Reserve Media Menu</td>
</tr>
<tr>
<td>Reserve Menu</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reserve Confirmation</td>
<td>Menu</td>
<td>Menu Selection</td>
<td>Output Selection</td>
<td>Display Reserve Media Menu, or return to Display Main Menu</td>
</tr>
<tr>
<td>Display Account</td>
<td>Menu</td>
<td>Menu Selection</td>
<td>Output Selection</td>
<td>Selected Page</td>
</tr>
<tr>
<td>Info Menu</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Display Reserved</td>
<td>Get Reserved</td>
<td>No Input</td>
<td>Query database for user's reserved media list</td>
<td>Return to Display Account Info Menu upon return request</td>
</tr>
<tr>
<td>Media</td>
<td>List</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Display Checked</td>
<td>Get Checked</td>
<td>No Input</td>
<td>Query database for user's checked out list</td>
<td>Return to Display Account Info Menu upon return request</td>
</tr>
<tr>
<td>Out Media</td>
<td>Out List</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Library Staff Diagram

- **HTML Browser** → **Display Login Menu**
- **Display Login Menu** → **Login** → **Display Main Menu**
- **Display Main Menu** → **Display Account Options Menu**
- **Display Account Options Menu** → **Menu Selection** → **Output Selection**
- **Output Selection** → **Selected State**
- **Selected State** → **Display Login Menu**
- **Display Login Menu** → **Login** → **Display Main Menu**
- **Display Main Menu** → **Display Account Options Menu**

**Events and Actions**

<table>
<thead>
<tr>
<th>Current State</th>
<th>Event</th>
<th>Input</th>
<th>Action</th>
<th>Next State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display Login Menu</td>
<td>Login</td>
<td>User ID and Password</td>
<td>Validate Login</td>
<td>If login fails, loop to current state. Else Display Main Menu</td>
</tr>
<tr>
<td>Display Main Menu</td>
<td>Menu</td>
<td>Menu Selection</td>
<td>Output Selection</td>
<td>Selected State</td>
</tr>
<tr>
<td>Display Account Options Menu</td>
<td>Menu</td>
<td>Menu Selection</td>
<td>Output Selection</td>
<td>Selected State</td>
</tr>
<tr>
<td>Current State</td>
<td>Event</td>
<td>Input</td>
<td>Action</td>
<td>Next State</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>----------------</td>
<td>---------------------</td>
<td>---------------------------------------------</td>
<td>------------------------------------------------</td>
</tr>
<tr>
<td>Display Create Account Menu</td>
<td>Create Account</td>
<td>Account parameters</td>
<td>Query database to validate request</td>
<td>If request valid, Display Change Confirmation. Else loop to current state</td>
</tr>
<tr>
<td>Display Update Account Menu</td>
<td>Update Account</td>
<td>Account parameters</td>
<td>Query database to validate request</td>
<td>If request valid, Display Change Confirmation. Else loop to current state</td>
</tr>
<tr>
<td>Display Delete Account Menu</td>
<td>Delete Account</td>
<td>Account parameters</td>
<td>Query database to validate request</td>
<td>If request valid, Display Change Confirmation. Else loop to current state</td>
</tr>
<tr>
<td>Display Account Change Confirmation</td>
<td>Confirm Account Change</td>
<td>User confirm</td>
<td>Update database to reflect change</td>
<td>Display Account Options Menu</td>
</tr>
<tr>
<td>Display Media Menu</td>
<td>Menu</td>
<td>Menu Selection</td>
<td>Output Selection</td>
<td>Selected Menu</td>
</tr>
<tr>
<td>Display Checkin Menu</td>
<td>Checkin Media</td>
<td>Media parameters</td>
<td>Query database to validate request</td>
<td>If request valid, Display Change Confirmation. Else loop to current state</td>
</tr>
<tr>
<td>Display Checkout Menu</td>
<td>Checkout Media</td>
<td>Media parameters</td>
<td>Query database to validate request</td>
<td>If request valid, Display Change Confirmation. Else loop to current state</td>
</tr>
<tr>
<td>Display Media Change Confirmation</td>
<td>Confirm Media Change</td>
<td>User confirm</td>
<td>Update database to reflect change</td>
<td>Display Media Menu</td>
</tr>
<tr>
<td>Display Report Menu</td>
<td>Menu</td>
<td>Menu Selection</td>
<td>Query database to generate selected report</td>
<td>Display report or Display Main Menu upon return request</td>
</tr>
<tr>
<td>Display Report</td>
<td>Display Report</td>
<td>No Input</td>
<td>No Action</td>
<td>Return to Report Menu upon return request</td>
</tr>
</tbody>
</table>
Events and Actions

<table>
<thead>
<tr>
<th>Current State</th>
<th>Event</th>
<th>Input</th>
<th>Action</th>
<th>Next State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display Login Menu</td>
<td>Login</td>
<td>UserID and Password</td>
<td>Validate Login</td>
<td>If login fails, loop to current state. Else Display Main Menu</td>
</tr>
<tr>
<td></td>
<td>Logoff</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current State</td>
<td>Event</td>
<td>Input</td>
<td>Action</td>
<td>Next State</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>---------------------</td>
<td>---------------------</td>
<td>--------------------------------------------------</td>
<td>------------------------------------------------</td>
</tr>
<tr>
<td>Display Main Menu</td>
<td>Menu</td>
<td>Menu Selection</td>
<td>Output Selection</td>
<td>Selected State</td>
</tr>
<tr>
<td>Display Account Management Menu</td>
<td>Menu</td>
<td>Menu Selection</td>
<td>Output Selection</td>
<td>Selected State</td>
</tr>
<tr>
<td>Display Add Account Menu</td>
<td>Add Account</td>
<td>Account parameters</td>
<td>Query database to validate request</td>
<td>If request valid, Display Change Confirmation. Else loop to current state</td>
</tr>
<tr>
<td>Display Update Account Menu</td>
<td>Update Account</td>
<td>Account parameters</td>
<td>Query database to validate request</td>
<td>If request valid, Display Change Confirmation. Else loop to current state</td>
</tr>
<tr>
<td>Display Delete Account Menu</td>
<td>Delete Account</td>
<td>Account parameters</td>
<td>Query database to validate request</td>
<td>If request valid, Display Change Confirmation. Else loop to current state</td>
</tr>
<tr>
<td>Display Account Change Confirmation</td>
<td>Confirm Account Change</td>
<td>User confirm</td>
<td>Update database to reflect change</td>
<td>Display Account Options Menu</td>
</tr>
<tr>
<td>Display Media Management Menu</td>
<td>Menu</td>
<td>Menu Selection</td>
<td>Output Selection</td>
<td>Selected Menu</td>
</tr>
<tr>
<td>Display Add Media Menu</td>
<td>Add Media</td>
<td>Media parameters</td>
<td>Query database to validate request</td>
<td>If request valid, Display Change Confirmation. Else loop to current state</td>
</tr>
<tr>
<td>Display Update Media Menu</td>
<td>Update Media</td>
<td>Media parameters</td>
<td>Query database to validate request</td>
<td>If request valid, Display Change Confirmation. Else loop to current state</td>
</tr>
<tr>
<td>Display Delete Media Menu</td>
<td>Delete Media</td>
<td>Media parameters</td>
<td>Query database to validate request</td>
<td>If request valid, Display Change Confirmation. Else loop to current state</td>
</tr>
<tr>
<td>Display Media Change Confirmation</td>
<td>Confirm Media Change</td>
<td>User confirm</td>
<td>Update database to reflect change</td>
<td>Display Media Menu</td>
</tr>
</tbody>
</table>
VI Validation and Criteria

**Performance Bounds**

Response Time
The system shall respond to any change request within three seconds, while query requests shall be completed in no more than ten seconds. In addition, the time required for either of these events will not be dependant on the number of users connected to the system. These requirements will be achieved by designing the server platforms with the capability to accommodate four times the maximum number of users during peak access time periods.

Reliability
System up time shall be no less than 98%. This will be achieved by the redundant server hardware platform implementation, which will facilitate, at a minimum, one server platform being on line during maintenance, scheduled and unscheduled.

**Classes of Tests**

Functionality
This set of tests will verify system functionality is operational and meeting design criteria.

Performance
This set of tests will verify that the system is operating within the limits set in the Performance Bounds Section above.

Reliability
This set of tests, in conjunction with historical data, will allow overall system up time to be evaluated and compared to the specification set in the Performance Bounds Section above.
VII Bibliography


VIII Appendix

**Major Function Summary**

Login Function (Shared Function) – provides security and to control the user's level of access.

Media Search Function (Shared Function) – search the media database for books, magazines/periodicals, and multi-media

Media Reservation Function (Student/Faculty Function) – allow users to reserve media resources that are currently checked out

Account Status Check Function (Student/Faculty Function) – allow users to check the status of their library account

Overdue Fee Payment Function (Student Function) – allow users to pay overdue fees through online banking system

User Account Set-up Function (Library Staff and Administrator Function) – allow library staff to add, delete, and update user accounts

Media Check in/Check out Functions (Library Staff Function) – allow library staff to check media in and out

Report Generation Function (Library Staff and Administrator Function) – allow library staff and administrator to generate reports

Media Management Function (Administrator Function) – allow administrator to add, delete, and update media resources

Access Control Function (Administrator Function) – controls the user's level of access and provides user verification

Account Management Function (Administrator Function) – allow administrator to add, delete, and update library staff accounts