Appendix C-1: Detailed Design for Login/Logout

Diagram:

- Default.asp
  - <<Redirect>>
  - Login.cfm
    - <<Redirect>>
    - ListCourse.cfm
      - <<Include>>
      - SearchTitle.cfm
        - TLCurUsers.cfm
        - TLUUserInfo.cfm
          - TLGeneral.cfm
            - TLUUpdateUser.cfm
              - CourseCenter.cfm

- SearchCenter.cfm
  - <<Submit>>
  - List Course
    - ListCourse.cfm
      - <<Generate>>
      - SearchTitle.cfm

- Logout.cfm
- Instr
- Admin
- IndependentLO

Diagram arrows indicate flow of control and data.
Overview
This module performs user verification based on NT login name. Successful login will be redirect to course catalog interface.

Public Methods

Login
Parameters:
  NT Login Name (Implicit)
Returns:
  None
Description:
  Automatically detect NT login name and verify its role in database. If a previous session exists which means that the user didn’t logout properly, then the system will give warning message and continue the previous session, otherwise a new session will be used. Session ID, User ID, Role Type will be stored in session variables.

Logout
Parameters:
  None
Returns:
  None
Description:
  Setting the end time of a LO viewing process and changing login status to false after checking the session validation.

ListCourse
Parameters:
  Role (Session)
Returns:
  None
Description:
  Check user role type stored in the session variables and render course listing interface. For Administrator/LO Owner, it has links to Independent LO listing module. For administrator, it shows administration interface in addition. For all users, it has links to courses in the system by showing their title.
Appendix C-2 Detailed Design CourseCenter
Overview

This module provides the interface for course related operations.

Public Methods

CourseCenter
Parameters:
  LOID
Returns:
  None
Description:
  Render Course LO related interface according to authorization result and Reproduce field settings. An unauthorized user can only access Course LO viewing and metadata viewing. For authorized user, if Reproduce field of this Course LO is allowed then Reproduce link will appear. An authorized user, in addition to unauthorized user, can also access Independent LO listing, Adding a new Subheading LO, deleting this course, metadata management, content packing and usage statistic viewing. The module also has links to simple operations at the Subheading level (Add/Delete) and links to resources LOs to each Subheadings LO in the course LO by showing their titles.

CourseAuthorization
Parameters:
  LOID, role (Session)
Returns:
  IsAuthorized (1/0)
Description:
  Administrator is always authorized. Course owner is also authorized.

ViewCourse
Parameters:
  LOID
Returns:
  None
Description:
  Display retrieved course content either locally or from remote sites according to its internal URL.
Appendix C-3 Detailed Design for ResourceCenter
Overview

This module provides the interface for Resource related operations.

Public Methods

ResourceCenter
Parameters:
  LOID (URL)
Returns:
  None
Description:
  Render Resource LO related interface according to authorization result and reproduce settings. An unauthorized user can only access Resource LO viewing and metadata viewing. For authorized user, if Reproduce field of this resource is allowed then Reproduce link will appear. An authorized user, in addition to unauthorized user, can also access Independent LO listing, Adding a new Section LO, deleting this Resource LO, metadata management, content packing and usage statistic viewing. The module also has links to Section LOs by showing their titles.

ResourceAuthorization
Parameters:
  LOID, role (Session)
Returns:
  IsAuthorized (1/0)
Description:
  Administrator is always authorized. Direct owners of this Resource LO or any indirect owners that owns the parent LOs (Subheading or Course) of this Resource LO are also authorized.

ViewResource
  (See Appendix C-6).
Appendix C-4 Detailed Design for SectionCenter
Overview
This module provides the interface for Section related operations.

Public Methods

SectionCenter
Parameters:
  LOID (URL)
Returns:
  None
Description:
  Render Section LO related interface according to authorization result and reproduce settings. An unauthorized user can only access Section LO viewing and metadata viewing. For authorized user, if Reproduce field of this section is allowed then Reproduce link will appear. An authorized user, in addition to unauthorized user, can also access Independent LO listing, Adding a new Multimedia LO, deleting this Section LO, metadata management, content packing and usage statistic viewing. The module also has links to Multimedia LOs by showing their titles.

SectionAuthorization
Parameters:
  LOID, role (Session)
Returns:
  IsAuthorized (1/0)
Description:
  Administrator is always authorized. Direct owners of this Section LO or any indirect owners that owns the parent LOs (Resource, Subheading or Course) of this Section LO are also authorized.

ViewSection
Parameters:
  LOID
Returns:
  None
Description:
  Display retrieved Section content either locally or from remote sites according to its internal URL.
Appendix C-5 Detailed Design for MMediaCenter
Overview
This module provides the interface for Multimedia related operations.

Public Methods

**MMediaCenter**

**Parameters:**
- LOID (URL)

**Returns:**
- None

**Description:**
Render Multimedia LO related interface according to authorization result and reproduce settings. An unauthorized user can only access Multimedia LO viewing and metadata viewing. For authorized user, if Reproduce field of this multimedia file is allowed then Reproduce link will appear. An authorized user, in addition to unauthorized user, can also access Independent LO listing, deleting this Multimedia LO, metadata management, content packing and usage statistic viewing.

**ResourceAuthorization**

**Parameters:**
- LOID, role (Session)

**Returns:**
- IsAuthorized (1/0)

**Description:**
Administrator is always authorized. Direct owners of this multimedia LO or any indirect owners that owns the parent LOs (Section, Resource, Subheadings or Course) of this Multimedia LO are also authorized.

**ViewMMedia**

**Parameters:**
- LOID

**Returns:**
- None

**Description:**
Display retrieved Multimedia content either locally or from remote sites according to its internal URL. The system currently supports GIF/JPEG images, MS powerpoint/Word, Adobe PDF, Flash, Quicktime movie and Real Media.
Appendix C-6 Detailed Design for ViewResource

Notes: UserInterface and ResourceCenter has links to "SearchCetner" and "Logout"
Overview
This module performs Resource LO viewing by dynamically frame generation based on user template selection. Several auxiliary methods are also included.

Public Methods

ViewResource
Parameters:
  LOID
Returns:
  None
Description:
  Automatic generate dynamic frames and their contents based on user template selection.

ViewSingleLO
Parameters:
  LOID
Returns:
  None
Description:
  Retrieve a single LO and display it in a frame without generating management interface as in LO centers.

ViewParentTitle
Parameters:
  LOID
Returns:
  None
Description:
  Retrieve the title of the parent LO of this resource LO and display it in the top-left frame if certain template is selected.

ViewChildTitle
Parameters:
  LOID
Returns:
  None
Description:
  Retrieve the title of this resource LO and display it in the top-right frame if certain template is selected.
**GenNavBar**

**Parameters:**
- LOID

**Returns:**
- None

**Description:**
Generate navigation bar of the LO hierarchy down to the parent level of the LO currently under viewing and display it in the bottom-left frame if certain template is selected.

**GenAccessory**

**Parameters:**
- LOID, Frame

**Returns:**
- None

**Description:**
Generate accessory links (index, introduction, credits) associated with a Resource LO in the bottom-right frame if certain template is selected. Contents of this links will be displayed in a frame specified by “Frame” URL variable when hit.

**ViewIndex**

**Parameters:**
- LOID

**Returns:**
- None

**Description:**
View the index for a resource. It can be stored in a LO or automatically generated from its sub-LOs. We currently use the second method.

**ViewIntroduction**

**Parameters:**
- LOID

**Returns:**
- Introduction associated this Resource LO.

**Description:**
View the introduction for a resource. It can be stored in a LO. We currently leave it blank.

**ViewCredits**

**Parameters:**
- LOID

**Returns:**
Credits associated this Resource LO.

**Description:**
Generate credits (including developer, contact, SME) by querying UserInfo database.

**UserInterface**

**Parameters:**
- LOID

**Returns:**
- None

**Description:**
Interface for viewing accessory components (index, introduction, credits) and template selection as well as viewing resource.

**TemplateForm**

**Parameters:**
- LOID

**Returns:**
- None

**Description:**
Display a form for selecting a template. Templates not suitable for display of this Resource LO will be automatically disabled.

**UpdateTemplate**

**Parameters:**
- LOID

**Returns:**
- None

**Description:**
Update the template selection in database. Redirect user to either ResourceCenter or ViewResource according to user preference.
Appendix C-7 Detailed Design for Metadata Management

Notes: Besides MetaCenter and KeywordCenter as shown in this Figure, the other five modules UpdateMeta, DeleteKeyword, ProcessKeyword, EditKeyword and UpdateKeyword, also include SearchTitle and their generated HTML pages link to SearchCenter and Logout.
Overview
This module performs metadata management.

Public Methods

MetaCenter
Parameters: LOID
Returns: None
Description: Metadata display and editing and linking to Keyword management

UpdateMeta
Parameters: LOID
Returns: None
Description: Update metadata information based on user input

ViewMeta
Parameters: LOID
Returns: None
Description: Viewing metadata of a LO. No editing is allowed.

KeywordCenter
Parameters: LOID
Returns: None
Description: Listing all keywords and their associated MeSH IDs. Interface to add a new keyword.

ProcessKeyword
Parameters: LOID, keyword
Returns: None
Description:
Prompts user to choose MeSHIDs to be associated with the input keyword

AddKeyword
Parameters:
   LOID, keyword
Returns:
   None
Description:
   Adds MeSHIDs selected in ProcessKeyword.cfm to database.

EditKeyword
Parameters:
   LOID, KeyID
Returns:
   None
Description:
   Edit (adding/deleting) MeshIDs associated with a previous entered keyword in a LO.

UpdateKeyword
Parameters:
   LOID, keyword
Returns:
   None
Description:
   Updates MeshIDs based on selection result from EditKeyword

DeleteKeyword
Parameters:
   LOID, keyword
Returns:
   None
Description:
   Deletes a keyword and its associated MeshIDs of a LO

ParseNLM
Parameters:
   keyword
Returns:
   A two-dimensional array storing parent/child MeshIDs.
Description:
   Parse query result from NLM based on input keyword into a two-dimensional array storing parent/child MeshIDs.
Appendix C-8 Detailed Design for Search Engine

Diagram:
- **SearchCenter**
  - <<submit>>
  - <<Include>> ParseNLM.inc
- **SearchForm**
  - <<submit>>
  - <<Include>> SearchTitle.cfm
- **SearchResult**
  - <<Generate>>
  - <<mLink>> ViewCourse.cfm
  - <<mLink>> ViewResource.cfm
  - <<mLink>> ViewSection.cfm
  - <<mLink>> ViewMMedia.cfm
- **Logout.cfm**
- **ViewMeta**
- **ViewMeta.cfm**
- **ParseNLM.inc**
- **SearchForm.cfm**
- **SearchResult.cfm**
- **SearchTitle.cfm**
- **ViewCourse.cfm**
- **ViewResource.cfm**
- **ViewSection.cfm**
- **ViewMMedia.cfm**
Overview
This module performs metadata based searching.

Public Methods

SearchTitle
Parameters:
None
Returns:
None
Description:
Links to meta search, home and logout. This method is called in all independent functional modules.

SearchCenter
Parameters:
None
Returns:
None
Description:
First GUI to allow user to specify which attributes to be searched on

SearchForm
Parameters:
IsKeyWord, Keyword, isLOType, isIntendedEndUser, isTitle, isDeveloperNotes, isAnnotation, isDuration, isSize, isUserHits, isCreationDate, isLastEditDate, isLastAccessDate, isMediaType, whichMediaType, isWords, isPages, isIHSIZE, isIVSize, isColorDepth
Returns:
None
Description:
Second GUI to allow user specify criteria values for a search

SearchResult
Parameters:
Dynamic and depends on user selection in SearchForm method.
Returns:
None
Description:
Dynamically generates SQL query string and renders query result.
Appendix C-9: Detailed Design Diagram for tracking/logging statistics

Notes: All the modules generate HTML page include “SearchTitle.cfm” and have links to “Home” and “Logout”
Overview

This module generates tracking and logging statistic related pages.

Public Methods

**TLCurUsers**
Parameters:
None
Returns:
None
Description:
Display Current Users in the system

**TLUserInfo**
Parameters:
None
Returns:
None
Description:
Display information of all system users

**TLProfile**
Parameters:
UserID
Returns:
None
Description:
Display profile of a particular user

**LOTTitleLink**
Parameters:
LOID (implicit)
Returns:
None
Description:
Generate links to LO viewing modules according to LO types by showing title of LOs.

**LOTTypeLink**
Parameters:
LOTType (implicit)
Returns:
None
Description:
Transferring numeric LO Types into their type names.
**TLGeneral**
Parameters: None
Returns: None
Description: Display general statistics of system utilization.

**TLQBrowser**
Parameters: Item (1-8)
Returns: strST, strET, nIE55, nIE50, nIE40, nOther, nTotal
Description: Generate statistics for browser types according to item types (1/today, 2/yesterday, 3/this week, 4/last week, 5/this month, 6/last month, 7/this year, 8/last year)

**TLQISRatio**
Parameters: Item (1-8)
Returns: nStudent, nInstructor, nOther, nTotal
Description: Generate statistics for student/instructor ratio according to item types (1/today, 2/yesterday, 3/this week, 4/last week, 5/this month, 6/last month, 7/this year, 8/last year)

**TLQOverall**
Parameters: Item (1-8)
Returns: strST, strET, nuserID, nVisit, nRequest, nDuration
Description: Generate statistics for Overall Activities according to item types (1/today, 2/yesterday, 3/this week, 4/last week, 5/this month, 6/last month, 7/this year, 8/last year)

**TLTop20**
Parameters: None
Returns: None
Description:
Listing top 20 most popular LOs (By Requests)

**TLLastUpdate20**

**Parameters:**
None

**Returns:**
None

**Description:**
Listing last 20 Edited LOs

**TLDatetime**

**Parameters:**
- type

**Returns:**
- str_st, str_et

**Description:**
Generating start and end time of today/yesterday/this week/last week/this month/last month/this year/last year. This method is used in TLQBrowser.cfm, TLQISRatio.cfm, TLQOverall.cfm.

**TLSession**

**Parameters:**
- SessionID

**Returns:**
None

**Description:**
Listing all LOs viewed in the session.

**TLUpdateUser**

**Parameters:**
None

**Returns:**
None

**Description:**
Display LO owner's login names and its link to their LOs

**TLUpdateLO**

**Parameters:**
- UserID, UserName

**Returns:**
None
Description:
Show last 20 updated LOs of a particular LO owner

TLQueryForm
Parameters:
None
Returns:
None
Description:
GUI to accept start time and end time to query statistics over a period of time

TLLOStat
Parameters:
sy, sm, sd, ey, em, ed
Returns:
None
Description:
Display Statistics of a LO over a given period.

TLUpdateDB
Parameters:
TLID (Session)
Returns:
None
Description:
Updates tracking/logging table to sent the end of previously viewing LO and sent the begin time of currently viewing LO. Increases UserHits by 1.
Appendix C-11 Detailed Design for Packaging
Overview

This module generates IMS compatible metadata in XML format and packing both metadata and related LO into a zipped file.

Public Methods

PackageLO

Parameters:
LOID

Returns:
None

Description:
Main method for LO packaging.

GenIMSManifest

Parameters:
LOID

Returns:
IMSString

Description:
Generate IMS compatible metadata and put the result in a string.

RefindLast

Parameters:
srcStr, tobeFound

Returns:
pos

Description:
Gets the position of the last appearance of a target string in a source string
Appendix C-12 Detailed Design for Uploading/Deleting
Overview

This module performs LO uploading. Several metadata attributes such as file size, create date, MIME type will be automatically inserted into database. Multimedia attributes, such number of words, number of pages/slides, horizontal and vertical image size and color depth will also be retrieved and inserted into multimedia LO tables. Relationship between uploaded LO and its parent LO is inserted into LORelation table. Ownership information is inserted into RLOCont table. Independent LOs always use UserID as their parents IDs.

Public Methods

**AddLOForm**

**Parameters:**
- ParentID, Type

**Returns:**
- None

**Description:**
- GUI for LO uploading.

**AddLOComponent**

**Parameters:**
- ParentID, Type

**Returns:**
- None

**Description:**
- Performs file upload, retrieves meta data attributes and update database.

**IndependentLOCenter**

**Parameters:**
- None

**Returns:**
- None

**Description:**
- List all independent LOs associated with a user (userID) and generate links to add all types of independent LOs.

**DeleteLO**

**Parameters:**
- LOID

**Returns:**
- None

**Description:**
- Deletes a specific LO and its relation to its super LO