

# bLms Library Management System

This document captures the product feature details of LMS, a general purpose Library Management System.

## High level features:

- Multiple libraries served from the same database.
- Simple, clear interface for administrator and patrons of the library.
- Lending items to patrons.
- Reserving items by patrons or administrator (on a patron's behalf).
- ISBN lookup against isbndb.com to enable easy addition of book details.
- Ability to generate Barcodes for easy management of inventory.
- Search items by multiple criteria such as title, description.
- Simple reporting for item and patrons. Item report can show details such as loans or reservations against the item.
- Export and Import of items to and from Excel sheet.
- Patrons can keep track of the transactions made by them.
- Ability to automatically clear unclaimed reservations through a scheduled job.

The system supports two types of users, who are authenticated by the system. **Admin** - A user belonging to this role, would be able to administer his library hosting the LMS. **Patron** - A user belonging to this role, is a consumer of library services.

## Administration

The main home page of admin consists of a menu. The menu has these following lists

- Register Patron
- Search Items
- Export/Import Items
- Loan Item
- Return Item
- Add reservation
- Generate Barcode
- Add Book
- Deactivate Patron
- Register Patron
- Edit Patron
- Process Payment
- view Patron
- view Item
- Edit Profile

### 1. Register Patron

An administrator to register a Patron, by providing the details such as user Id (patron Id), name, email address, address, contact numbers etc. User Id is unique. The following rules are checked while adding a patron.

- There cannot be two patrons with the same user Id.
- Administrator can add the patron to his specific library.
- He cannot add patron to some other library.

## **2.Search Items**

An administrator would be able to search items in the database .The system would produce a paginated result set. The system would allow reserving items in the result, provided all instances are out on loan. The system would also allow to edit the details of an items. Those items only displayed which belongs to his library. The following rules has to be checked while searching the item.

- He cannot search for an item which belongs to another library.
- If he tries to do so then an error message should be displayed.

## **3.Export the current inventory in Microsoft Excel format**

An administrator would be able to export the current inventory in Microsoft Excel format. There would be two sheets in the excel file. One would contain the inventory. The other would contain general instructions on how to edit the inventory. The excel sheet consists of no of columns same as database. By doing this he can get the database in the excel sheet. The excel sheet consists of all the record which are present in the database.

## **3.Import new inventory into the database**

An administrator would be able to import new inventory into the database. Best way is to export the current inventory, edit it and then upload the same file. These rules are checked while importing inventory into database. Version field should be left intact. This would ensure in maintaining the integrity of the database. Id field should be left blank for new items.

## **4.Loan Item**

An administrator would be able to lend an item to a patron by providing the item tag and patron Id. The following rules are checked while lending an item.

- The item should be available in the inventory.
- There shouldn't be any outstanding reservation against this item by another patron.
- The number of items already loaned out to this patron is less than system limit.
- The patron is valid and active patron.
- Also, if the lender had a reservation against this item, that reservation would be cancelled by the system.
- The item should belongs to his library.
- Administrator should have the rights to loan that item this is possible only if

the item belongs to his library.

- If he tries to loan the item which does not belong to his library then he should get an error message.

## **5. Return item**

An administrator would be able to process the return of an item by a patron. The following rules are checked while returning an item.

- The item is out on loan.
- The item should be present in the inventory.
- This patron has been issued this book
- The patron is active and valid patron.
- The item should belong to his library.

## **6. Add Reservation**

An administrator would be able to reserve an item for a patron. The following rules are checked while reserving an item.

- Patron is active and valid.
- Patron has not crossed his limit of number of reservations.
- The item should belong to his library.

## **7. Generate Bar code**

Here administrator would be able to create barcode image for a specific item. He should enter number in the text field then corresponding bar code image will be displayed in the next window so that he can take the print out. The barcode is generated for a number as well as for a text. The length of the text and number has no limitation. The bar code image is different for different input. There will be no same barcode image for two different inputs.

## **8. Add Book**

An administrator would be able to add an item into the library inventory, by capturing details such as item tag, item type, title description, language, subject, number of items in the inventory, number of items out on loan etc.. The following rules are checked while adding an item.

- The item Tag should be unique for each book.
- The item should get saved into that particular library of which the administrator has the rights.

## **9. Deactivate Patron**

An administrator can deactivate a patron for various reasons. A deactivated patron would not be able to login to the system. These rules are checked while deactivating the patron.

- The patron should be a member of his library.
- He cannot deactivate the patron who will not be the member of his library. If he tries to deactivate then he should get an error message.

## **10. Edit Patron**

An administrator can edit details about an existing patron. The following rules are checked while editing a patron.

- Administrator can edit the patron how belongs to his library. He would not have the rights to edit the patron who belongs to different library.
- The edited part should get updated in the Database.
- That patron should be active patron.

## **11. View Patron**

An administrator would be able to quickly see the loans, reservations and patron details made by a patron. The following rules are checked while viewing a patron.

- Administrator would be able to view the patron who belongs to his library. If the patron does not belong to his library then he should get an error message.
- The details of the that specific patron id should be displayed which is given by the administrator.
- That patron should be active patron.
- The number of items already loaned out to this patron is less than system limit.

## **12. View Item**

Administrator would be able to get the description of the items with respect to the Item tag entered by the administrator. In this Panel he will get a list box which consists of Show Loan, Show Reservation, show item details. Show loan displays the report of the loaned items like loan date, loan due date, loan status etc. Show reservation displays the details of the reserved items like reservation status, reservation date etc. Show item details displays the details of the item like author of the item, item description, no of item in the Inventory, no of loaned items, title of the item etc. These conditions will be satisfied only if the only if the entered item tag belongs to that library. These conditions are checked.

- The item should belong to his library.

- If that item does not belong to his library then an error message is displayed

## Patron

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Patron would be able to perform the following activities.

### **1. Search Items**

A patron would be able to search items in the database. These rules are checked

- The system would produce a paginated result set.
- The system would allow reserving items in the result, provided all instances are out on loan.
- The system would produce a result of books of a library of which the patron belongs.
- The patron should be valid and active.

### **2. Reserve Items**

Patron would be able to reserve items from search page. These rules are checked

- Patron should be active and valid.

### **3. Check his/her reservations**

A patron can check reservations against his/her name and their current status. These rules are checked

- The patron should be active and valid.

### **4. Check his/her loans**

A patron can check loans against his/her name. These rules are checked

- The patron should be active and valid.

### **5. Check his/her payments**

A patron can check the payments he has made. These rules are checked

- The patron should be active and valid.

## Notes

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- i. Item Tag and Patron Id are kept as strings. These are expected to be Barcodes in the future. Patron identification can be done using barcode printed on his/her membership card. An item can have its barcode as well. All instances of same item is expected to have the same item tag. The system supports system wide configurable parameters for controlling the execution of the system. This include max number of days an item can be loaned, max number of loans/reservations for a patron, number of a days to hold an item once a reservation is notified etc.
- ii. The system runs a scheduled job to clean up unclaimed reservations after stipulated number of days. By default it is run at 6AM every day. The scheduler can be configured by editing the applicationContext-quartz.xml file.
- iii. The system is designed to support item types other than books. This is supported by having some 7 unused fields. Since the system uses ORM mapping, it is very easy to map these fields' domain specific attribute names in classes. The application code mostly operates on the abstract type, Item. So it is expected that there will not be much of code changes in the business logic layer with new types of items. The system has used factory pattern for creation of its specific classes such as (domain classes, panels, exporter, importer etc. Item tag is unique within the library. Two different libraries can have the same item tag.