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Revision History

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1. Actors

![Actors Diagram]

**Figure 1 - Actors Diagram**

- **UC.Customer**
  - Customers need the following functionality from the system:
    - Search for an item in library funds;
    - Get details of a library item;
    - Reserve items;
    - Check status summary (borrowed books, reserved books, due times, etc.).
  - They need to access the system both locally (i.e. inside the library) and from the Web.
  - Owner: Users
  - Child List: None.

- **UC.Librarian**
  - The role of librarians is to register customer users, handle loans and returns, provide information to customers, and manage library items: register new items, remove (discard) old library items, edit item. Librarians need to use this functionality only locally (i.e. inside the library).
  - Owner: Users
  - Child List: None.

- **UC.Administrator**
  - The role of administrator is to register and remove librarian users, also edit system settings. Administrator needs to access system only locally, i.e. inside the library or from his workplace.
  - Owner: Users
  - Child List: None.
• UC.System user
  The following properties need to be defined for both customer and librarian users:
  · System access info:
  · Username (unique);
  · Password;
  · ID (e.g. social security number);
  · Full Name (First, Middle, Last);
  · Birth date;
  · Contact info:
  · Phone;
  · E-mail;
  · Address.
  The following additional properties have to be defined for librarian user:
  · Duties;
  · Date of started working in library.
  The following additional properties have to be defined for customer users:
  · Faculty;
  · Faculty enter year;
  · Subscription date;
  · Status.
  The value of username for customers is an auto-incremental number generated by the system. This number is called customer number and is used for identification of a customer when loaning or returning a library item.
  Owner: Users
  Child List: Customer, Librarian

• UC.User
  Owner: Users
  Child List: System user, Administrator

2. Use-Case Model of the System
3. UC2. System Settings

3.1. UC2.1. Check system settings

**Description**

Another use cases check system settings in order to process their tasks. This use case demonstrates use cases reusability.

**PreCondition**

- Request to check system settings
3.2. UC2.2. Change system settings

Description
Administrator may change predefined settings for library system.

Actors
1. Administrator

PreCondition
• Request to change system settings

PostCondition
• System settings are changed.

Non Functional Requirements
• System settings include:
  - Reading item loaning time
  - Reading items loaning limit
  - Reservations limit
  - Penalties for reading item return violation.

4. UC7. Loan Registration

Figure 4 - Loan Registration Diagram

Figure 4 - Loan Registration Diagram
4.1. UC7.2. Get customer status summary

Description
The abstract use case. The librarian may get the list of loaned reading items of the selected customer. Also, the customer may get his own list of loaned reading items. The reading items list contains the loaned reading items and the time when the item shall be returned. If the return time is passed, the reading item is marked.

Actors
1. Customer
2. Librarian

PreCondition
• Request to display customer status.

Non Functional Requirements
• Loaned items list for customer shall be displayed. List shall include:
  - information about item,
  - loan date,
  - the date when item must be returned.

4.2. UC7.4. Penalize for overdue

Description
If customer does not return the reading item in specified time limit, the librarian may penalize the customer for overdue. The librarian may shorten the reading items list limit for the customer, etc.

PreCondition
• Return violation extension point is reached - the reader is late to return the loaned reading item.

Basic Flow of Events
• 1. The system displays possible items of penalizing.
  2. The librarian selects the penalizing method.
  3. The system updates reader properties information.

Alternative Flow of Events
• Alternative Flow #1: The librarian selects not to penalize customer [step 2 of main flow]:
  1. The system applies no penalization for the reader.
• Alternative Flow #2: The librarian selects to give warning to the customer [step 2 of main flow]:
  1. The system adds warning for the customer.
  2. Step 3 of main flow.
• Alternative Flow #3: The customer has 3 warnings [step 3 of main flow]:
  1. The system decreases customer number of reading items for loan
  2. The system resets number of warnings
  3. The system updates reader properties information.

Non Functional Requirements
• The penalizing methods are:
  - No penalization
  - Warning
- Shorten number of reading items for loan after 2 warnings

4.3. UC7.1. Register loan

Description
The librarian registers loan for the reader, after the reserved item gets available for the reader.
The reader cannot take more than the limit of items for the loan. The reader cannot take reading items for loan if he/she is penalized for not returned reading items.

Actors
1. Librarian

PreCondition
• Request to register loan.

Basic Flow of Events Diagrams
• Register Loan
Figure 5 - Register Loan Diagram

**PostCondition**
- Reading item is loaned to customer.

**4.4. UC7.3.Register return**

**Description**
The librarian registers the items that customer returns after loan. The customer must return reading items during defined time limit. If customer does not return the loaned reading item during defined time limit, the librarian may penalize the
customer for overdue.

**Actors**
1. Librarian

**PreCondition**
• Request to register item return.

**Basic Flow of Events Diagrams**
• Register Return

---

**PostCondition**
• The item return is registered for customer. Item is available for loaning.

**Extension Points**
• Register return

**Included Use Cases**
• Register return

*Non Functional Requirements*
• The loan period gets passed the next day after the loaned item return date.

5. UC.Users

6. UC1.System Access

![System Access Diagram](image.png)

*Figure 7 - System Access Diagram*

6.1. UC1.3.Change password

*Description*
Every user shall be able to constantly change his/her password for security reasons.

*Actors*
1. User

*PreCondition*
• The user requests to change password.
• System requests user to change password after password validation limit has expired.

*Basic Flow of Events*
1. The system requests to enter old password.
2. The user enters his old password.
3. The system requests to enter new password and repeat new password.
4. User enters and repeats his new password.
5. The system changes the user password.

*Alternative Flow of Events*
• Alternative Flow #1: User enters incorrect old password [step 2 of main flow]:
  1. System informs user that incorrect password is entered.
  2. Step 1 of main flow.
• Alternative Flow #2: New passwords do not match each other [step 4 of main flow]:
  1. System informs that passwords do not match.
  2. Step 3 of main flow.

PostCondition
• The user password is changed.

Non Functional Requirements
• Password shall be longer than 4 symbols.
• Password validation limit is 150 days.

6.2. UC1.1>Login
Description
As only registered users can use the system, every user has to provide his/her login information – login name and password – in order to use the system.

Actors
1. User

PreCondition
• User requests to login to a system.

Basic Flow of Events
• 1. The system requests the user to enter his login name and password.
  2. The user enters the login name and password.

Alternative Flow of Events
• Alternative Flow #1: User name or password is incorrect [step 2 of main flow]:
  1. System informs user that incorrect password or username is entered.
  3. Refer to step 1 of main flow.

PostCondition
• The user is logged into the system and may use appropriate functionality according user type - reader, librarian, or administrator.

6.3. UC1.2.Logout
Description
After the user ends working with the system, he logs out in order none can use his profile to add new reading items or for any other reason to pretend someone else.

Actors
1. User

PreCondition
• The user requests to log out from the system.

Basic Flow of Events
• 1. System saves user settings and logs user out.

PostCondition
• The user is logged out from the system.

7. UC6.Item Reservation
7.1. UC6.2.Cancel reservation

**Description**
The reader shall be able to cancel the reserved reading item. Also, the system cancels the reading item automatically after the defined time period is passed when it is available for loaning.

**Actors**
1. Customer

**PreCondition**
• Request to cancel reservation.

**Basic Flow of Events**
• 1. Select item to cancel reservation.
  2. Confirm the cancellation.
  3. The system removes the reading item from the reserved items list.
  4. The system marks the reading item as available.

**Alternative Flow of Events**
• Alternative Flow #2: The next customer that has requested the reservation of the selected reading item [step 4 of main flow]:
  1. The system updates all following readers reservation dates.
  2. The system e-mails the notification to the next customer.

**PostCondition**
• Reservation is cancelled.

**Included Use Cases**
7.2. UC6.4. Browse reservations

**Description**
The reader shall be able to browse his reservations list and make changes to the reservations. The reservations list item displays the reading item information and the time when the reading item shall become available.

**Actors**
1. Customer

**PreCondition**
- Request to review reserved items list.

**Non Functional Requirements**
- Reserved items list item shall display the reserved item and the time when the item becomes available for loan.
- If reading item is available at current time - none has taken it fo loan - the available time is 'currently available'.
- If there are no currently available copies of reading item, the date when reading item is available is the first return date of the reading item plus one day.

7.3. UC6.1. Make reservation

**Description**
The reader shall be able to reserve the selected reading item. The reading item is added to the readers reserved items list. The list item displays the reading item information and the time when the reading item is available for the loan.

**Actors**
1. Customer

**PreCondition**
- Request to make item reservation.

**Basic Flow of Events Diagrams**
- Make Reservation
Figure 9 - Make Reservation Diagram

**PostCondition**
- The reading item is added to the reserved items list for the customer.

**Included Use Cases**
- Make reservation

**Non Functional Requirements**
- The reserved items list item shall contain the reading item information and the date when the reading item is available for loan.
- If reading item is available at current time - none has taken it for loan - the available time is 'currently available'.
- If there are no currently available copies of reading item, the date when reading item is available is the first return date of the reading item plus one day.
- The availability for loan is defined using the FIFO principle.
• User is allowed to make reservation if reservation limit is not exceeded.
• Reservation limit is set in system settings.

7.4. UC6.3. Get notification

**Description**
User shall get e-mail notifications when reserved item becomes available or when reservation is cancelled. User also should be notified 1 day before reading item returning date.

**Actors**
1. Customer

**PreCondition**
• Reserved reading item is available
• Reading item reservation is cancelled
• Loaned reading item must be returned within 1 day.

8. UC3. User Management

![User Management Diagram](image)

*Figure 10 - User Management Diagram*
8.1. UC3.3. Remove librarian user

**Description**
Administrator shall be able to remove librarian users from library system.

**Actors**
1. Administrator

**PreCondition**
- Request to remove librarian user.

**Basic Flow of Events**
- 1. User confirms librarian user removal.
- 2. System removes librarian user from the database.

**PostCondition**
- Librarian user is removed.

8.2. UC3.2. Edit librarian's profile

**Description**
Administrator shall be able to edit librarian users personal information, permissions, and password.

**Actors**
1. Administrator

**PreCondition**
- Request to edit librarian user information.

**Basic Flow of Events**
- 1. User edits librarian personal information, permissions or password.
- 2. System saves modified librarian user information.

**Alternative Flow of Events**
- Alternative Flow #1: Incorrect password is entered [step 1 of main flow]:
  1. System notifies about incorrect password and asks reenter password.
  2. Step 1 of main flow.
- Alternative Flow #1: Entered passwords do not match [step 1 of main flow]:
  1. System notifies about that passwords do not match and asks reenter password.
  2. Step 1 of main flow.

**PostCondition**
- Librarian user information is changed.

**Non Functional Requirements**
- The password shall be longer than 4 symbols.

8.3. UC3.6. Remove customer user

**Description**
Librarian shall be able to remove customer users (readers) from library system. The customer user may only be removed from the system after he returns all his loans. All reservations user had made are cancelled.
Actors
1. Librarian

PreCondition
• Request to remove customer user.

Basic Flow of Events Diagrams
• Remove Reader

Figure 11 - Remove Reader Diagram

PostCondition
• Customer user is removed.
8.4. UC3.1. Add new librarian user

Description
Administrator shall be able to create new librarian users. The librarian personal information, permissions, login name and password shall be specified for each user.

Actors
1. Administrator

PreCondition
• Administrator requests to add new user.

Basic Flow of Events
• 1. User enters new librarian user name.
• 2. User enters librarian user passsword.
• 3. User reenters librarian user password.
• 4. User enters librarian user personal information.
• 5. User specify librarian user permissions.
• 6. System adds librarian to a database.

Alternative Flow of Events
• Alternative Flow #1: Entered user name already exists [step 1 of main flow]:
  1. System notifies about already existing user name.
  2. Step 1 of main flow.
• Alternative Flow #2: Passwords do not match [step 3 of main flow]:
  1. System notifies that entered passwords do not match.
  2. Step 2 of main flow.

PostCondition
• Librarian user is added.

Non Functional Requirements
• The librarian user's login name shall be unique.
• Librarian user's login name shall be longer than 5 symbols.
• The librarian's password shall be longer than 4 symbols.

8.5. UC3.4. Add new customer user

Description
Librarian user shall be able to create new customer users (readers). The customer personal information, login name and password shall be specified for a new customer.

Actors
1. Librarian

PreCondition
• Requests to add new customer.

Basic Flow of Events
• 1. Librarian enters new customer user name.
• 2. Librarian enters customer user passsword.
• 3. Librarian reenters customer user password.
• 4. Librarian enters customer user personal information.
• 6. System adds customer to a database.
Alternative Flow of Events

• Alternative Flow #1: Entered user name already exists [step 1 of main flow]:
  1. System notifies about already existing user name.
  2. Step 1 of main flow.

• Alternative Flow #2: Passwords do not match [step 3 of main flow]:
  1. System notifies that entered passwords do not match.
  2. Step 2 of main flow.

PostCondition

• Customer user is added.

Non Functional Requirements

• The customer user's login name shall be unique.
  Customer user's login name shall be longer than 5 symbols.
  • The customer's user password shall be longer than 4 symbols.

8.6. UC3.5. Edit customer's profile

Description

Librarian user shall be able to modify customer users (readers) personal information and password.

Actors

1. Librarian

PreCondition

• Request to edit customer user's information.

Basic Flow of Events

• 1. Librarian edits customer user's personal info and/or password
  2. System saves changed customer profile.

Alternative Flow of Events

• Alternative Flow #1: Incorrect password is entered [step 1 of main flow]:
  1. System notifies about incorrect password and asks reenter password.
  2. Step 1 of main flow.

• Alternative Flow #1: Entered passwords do not match [step 1 of main flow]:
  1. System notifies about that passwords do not match and asks reenter password.
  2. Step 1 of main flow.

PostCondition

• Customer user information has changed.

Non Functional Requirements

• The customer user's password shall be longer than 4 symbols.

9. UC4. Item Management
9.1. UC4.5.Order items

**Actors**
1. Librarian

9.2. UC4.2.Remove item

**Description**
The librarian shall be able to remove outdated items from library system. The outdated items are the ones that are lost or broken, so cannot be loaned.

**Actors**
1. Librarian

**PreCondition**
- Request to remove reading item.

**Basic Flow of Events Diagrams**
- Remove Reading Item
PostCondition
• Reading item is removed from loaning items database.

Included Use Cases
• Remove item

9.3. UC4.1. Add item

Description
The librarian shall be able to add new item to a library system. When adding the new reading item, the librarian shall enter the reading item information, define the number of items received, and the available loan period.

Actors
1. Librarian

PreCondition
• Request to add new item.

PostCondition
• Item is added to library system.

Non Functional Requirements
• Each item has unique ID.
• Each items shall consist:
  - Item ID
  - Information about item
  - Number of copies owned
  - Available loan period

9.4. UC4.4. Increase reading items

Description
The librarian increases count of the reading items when some more copies of existing reading items are received.

Actors
1. Librarian

Basic Flow of Events Diagrams
• Increase Reading Items
9.5. UC4.3. Edit item data

**Description**
The librarian modifies the reading items information when some error is entered into the reading item description.

**Actors**
1. Librarian

**PreCondition**
- Request to edit reading item data.

**PostCondition**
• Modified reading item data are saved in a database.

**Included Use Cases**
• Edit item data

**Non Functional Requirements**
• Reading item ID may not be edited.

## 10. UC5.Item Browser

![Item Browser Diagram](image)

*Figure 15 - Item Browser Diagram*

### 10.1. UC5.2.Get item details

**Description**
The librarian and customer shall be able review selected reading items details.

**Actors**
1. Customer
2. Librarian

**Included Use Cases**
• Get item details

### 10.2. UC5.1.Search for an item

**Description**
The librarian and customer shall be able search for reading items according selected search criteria.

**Actors**
1. Customer
2. Librarian

**Basic Flow of Events**
- 1. User defines the search criteria.
- 2. System founds some reading items according search criteria.
- 3. System allows browsing between search criteria.

**Alternative Flow of Events**
- Alternative Flow #1: System did not find any reading item matching the search criteria [step 2 of main flow]:
  1. System notifies the user.
  2. Step 1 of main flow.

**Included Use Cases**
- Search for an item

**Non Functional Requirements**
- The search shall be available according any property of the reading item. Also, the search shall be available according the type of reading.

### 10.3. UC5.3.Browse items

**Description**
The librarian and customer shall be able to browse all existing reading items. While browsing the search, the list of reading items matching the search results shall be displayed. The list item shall show all reading item information if the list is displayed in the expanded form. The list item shall show reading item title if the list is displayed in the short form.

**Actors**
1. Customer
2. Librarian

**Non Functional Requirements**
- The expanded form list item shall contain the reading item type, and all reading item information.
- The short form of list item shall contain the name of reading item.
- The user shall be able to switch between the short and expanded form of lists.
- User shall be able to list all reading items.