SOFTWARE ENGINEERING SCHEDULE-ANALYSIS DOCUMENT

# Requirements

## Functional requirements:

**Critical priority:**

1. As a librarian, I want to be able to add multimedia items to the system, so library users can borrow them.

2. As a library manager, I want to be able to add librarians to the system, so they can start using it once they are hired.

3. As a librarian, I want to add a library user to the system, so the librarians can lend multimedia items to them.

4. As a librarian, I want to lend a specific item of multimedia to a specific library user for 14 days, so they can borrow it.

**High priority:**

5. As a library manager, I want to be able to remove librarians from the system, so they cannot access it anymore if they are fired or gone.

6. As a librarian, I want to be able to remove multimedia items from the system, so multimedia items will not belong to the system anymore.

7. Both as a librarian and a library user, I want to be able to search for specific multimedia items, so I can check if the desired item is available in the library.

8. As a library user, I want to see the items I have borrowed and their information, including the remaining time, so I know when I have to return them.

9. As a librarian, I want to see the active fines of the library users when they try to borrow a multimedia item, so I can make sure that no one can borrow any items if they have a fine.

10. As a librarian, I want to be able to process a fine, so it can be removed once the library user has paid.

**Low priority:**

12. As a library user, I want to be able to see my previous borrowed multimedia items and previous fines and reviews so I can keep track of them.

13. As a librarian, I want to be able to see library users previously borrowed multimedia items, previous fines, and reviews so I can keep track of them.

14. As a library user, I want to be able to extend my borrowing of a specific item up to 3 times, so I can return the item later than it was supposed to.

15. As a library user, I want to be notified of the amount of money I must pay when the time of one of my borrowings has passed, so I know I must go to the library to pay the fine.

16. As a library user, I want to be notified 24 hours before my borrowing expires so I can return the media item or request an extension.

17. As a library user, I want to be able to reserve a multimedia item for 24 hours, so I can make sure that no one else will borrow it before me.

18. As a library user, I want to be able to give a review of the multimedia items I have rented, so other users will be able to read them.

19. As a librarian, I want to be able to delete a specific review, so I can make sure there are no inappropriate or offensive reviews.

11. As a library user, if I try to reserve a book that is not available, I want to be notified when it becomes available, so I know I can borrow it then.

## Non-functional requirements

1. The system will be a client-server system.
2. The system will be implemented in English.
3. All the registered data will be permanently stored in a database unless it is specifically removed by a librarian or manager.
4. The system will include a user guide to document how to use the user interface.
5. The system will include the following information:

* Books: isbn, title, publisher, author, edition, year of publication and genres (the mandatory information is isbn, title, publisher and genre)
* Magazines: title, publisher, volume, genre, date (day, month and year) (the mandatory information is title, publisher and date)
* Library user:
* Librarian: social security number (ssn), first and last name, date of employment and their password (all the information is mandatory)
* Library manager: social security number (ssn), first and last name and their password.

1. The manager will be fixed in the system, meaning that it cannot be modified or deleted.

# Use case diagram

* Manage multimedia items librarian (Requirements: 1, 6, )
* Manage librarians- manager (Requirements: 2, 5, )
* Extend a media item -library user (Requirements:)
* Lend a media item- librarian (Requirements:)
* Search multimedia items- librarian/library users (Requirements:)
* See information- librarian/library user (Requirements:)
* Manage fine- librarian/time (Requirements: )
* Write reviews- library user (Requirements: )
* Delete review library user /librarian
* Reserve multimedia item-library user (Requirements:)
* See notification library-user(Requirements:)

# Use cases

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| --- | --- |
| **Use case** | Manage multimedia items |
| **Summary** | A librarian has a multimedia item which needs to be added or removed from the system. In case they want to add it, they will use the system to record all the information about it. The system validates and records the data. On the other hand, if they want to delete it, they will have to select the item and use the system to delete it. The librarian will receive a confirmation message from the system with the operation (add or remove) that they have just performed. |
| **Actor** | Librarian. |
| **Precondition** | The librarian is logged in the system.  In case of removing an item, said item must be stored in the system. |
| **Postcondition** | The item and all its information will be successfully added/removed from the system. |
| **Base sequence** | CASE ADD:  1. The system asks which type of item wants to be added and displays a list of the options.  2. Select the type  3. System will ask for specific information for the chosen type of item. (see non-functional requirement e.)  4. Insert all the information and add the item. (ES 1)  5. System shows the updated list.  CASE REMOVE:  1. System asks which type of item wants to be removed and displays a list of the options.  2. Select the type.  3. System displays a list of all the items and give the possibility of applying filters to the search.  OPTIONAL:  3.1. Filter to find the desired item  3.2. System displays a list of the items that fulfill the filters.  3.3. Possibility to change the filters, go to case delete step 4.1  4. Select the item from the list and delete it.  5. The system displays the list with the remaining items. |
| **Exception sequence** | ES 1: the information is incomplete or against the system restrictions:  5a. System will display and error (see notes) and ask for the information to be introduced again  Go back to main flow, case add step 4. |
| **Notes** | Regarding the ES 1, the errors the system might display are the following:  Book:  Title can’t be null  Publisher can’t be null  Isbn can’t be null  Title must have less than 50 characters  Publisher must have less than 50 characters  Invalid date: future date (if the year of publication is a future one)  Magazine:  Title can’t be null  Publisher can’t be null  Day can’t be null  Month can’t be null  Year can’t be null  Title must have less than 50 characters  Publisher must have less than 50 characters  Invalid date (if the date is not a real one, ex. 31 of February)  Invalid date: future date (if the day is future)  This use case fulfills the requirements 1, 6 |

Test cases

### Case Add

Normal flow:

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| --- | --- | --- |
| Action no. | Action | Reaction |
| 1 | Choose add book | System asks for the title, publisher, author, isbn, year of publication, edition and a list of genres. |
| 2 | Introduce the following data:  Title: Daugther of Smoke and Bone  Publisher: Hodder & Stoughton  Author: Laini Taylor  ISBN: 978-0-316-13402-6  Year of publication: 2011  Edition: 1st  Genres: fantasy, romance, young adult fiction |  |
| 3 | Choose to add the book | System adds the book with the following information:  Title: Daugther of Smoke and Bone  Publisher: Hodder & Stoughton  Author: Laini Taylor  ISBN: 978-0-316-13402-6  Year of publication: 2011  Edition: 1st  Genres: fantasy, romance, young adult fiction.  The book is shown on the list and the values of the filled fields are reset. |

|  |  |  |
| --- | --- | --- |
| Action no. | Action | Reaction |
| 1 | Choose add magazine | System asks for: title, publisher, volume, genre, date |
| 2 | Introduce the following data:  Title: ‘swimming pools and gardens’  Publisher: HomeDeco  Volume: 57  Date:21/03/2019  Genres: house decoration |  |
| 3 | Choose to add the magazine | System adds the magazine with the following information:  Title: ‘swimming pools and gardens’  Publisher: HomeDeco  Volume: 57  Date:21/03/2019  Genres: house decoration  The magazine is shown on the list and the values of the filled fields are reset. |

Alternative flow: Librarian inputs incorrect type of data

1. Null value

BOOK:

Step 1-2 in normal flow except title is null

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| --- | --- | --- |
| 3. | Choose to add the book | System displays an error indicating that the title can’t be null and resets the values of the filled fields |

Go to step 2 normal flow

Step 1-2 in normal flow except isbn is null

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| --- | --- | --- |
| 3. | Choose to add the book | System displays an error indicating that the isbn can’t be null and resets the values of the filled fields |

Go to step 2 normal flow

Step 1-2 in normal flow except publisher is null

|  |  |  |
| --- | --- | --- |
| 3. | Choose to add the book | System displays an error indicating that the publisher can’t be null and resets the values of the filled fields |

Go to step 2 normal flow

Step 1-2 in normal flow except genre is null

|  |  |  |
| --- | --- | --- |
| 3. | Choose to add the book | System displays an error indicating that book must have at least one genre and resets the values of the filled fields |

Go to step 2 normal flow

MAGAZINE:

Step 1-2 in normal flow except title is null

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| --- | --- | --- |
| 3. | Choose to add the magazine | System displays an error indicating that the title can’t be null and resets the values of the filled fields |

Go to step 2 normal flow

Step 1-2 in normal flow except publisheris null

|  |  |  |
| --- | --- | --- |
| 3. | Choose to add the magazine | System displays an error indicating that the publisher can’t be null and resets the values of the filled fields |

Go to step 2 normal flow

Step 1-2 in normal flow except date is null

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| --- | --- | --- |
| 3. | Choose to add the magazine | System displays an error indicating that the date can’t be null and resets the values of the filled fields |

Go to step 2 normal flow

1. Future date

BOOKS:

Step 1-2 in normal flow except year of publication is 2023

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| --- | --- | --- |
| 3. | Choose to add the book | System displays an error indicating that the year of publication can’t be a future date and resets the values of the filled fields |

Go to step 2 normal flow

MAGAZINES:

Step 1-2 in normal flow except date is 21/05/2025

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| --- | --- | --- |
| 3. | Choose to add the magazine | System displays an error indicating that date is a future one and resets the values of the filled fields |

Go to step 2 normal flow

### Case Remove

Normal Flow:

BOOKS:

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| --- | --- | --- |
| Action no. | Action | Reaction |
| 1 | Choose remove book | Displays a list of the books that are in the system |
| 2 | Choose the 3rd book in the list | Highlighted 3rd book in the list |
| 3 | Choose to delete | Deletes the book and shows the list with the remaining magazines |

MAGAZINES:

without filtering:

|  |  |  |
| --- | --- | --- |
| Action no. | Action | Reaction |
| 1 | Choose remove magazine | Displays a list of the magazines that are in the system |
| 2 | Choose the 3rd magazine in the list | Highlighted 3rd magazine in the list |
| 3 | Choose to delete | Deletes the magazine and shows the list with the remaining magazines |

with filtering:

|  |  |  |
| --- | --- | --- |
| Action no. | Action | Reaction |
| 1 | Choose remove magazine | Displays a list of the magazines that are in the system |
| 2 | Include filters:  Year: 2021  Month: July  Genre: sports | Displays a list of the sports magazines published in July 2021 that are in the system |
| 3 | Change filters:  Month: July to May | Displays a list of the sports magazines published in May 2021 that are in the system |
| 2 | Choose the 3rd magazine in the list | Highlights 3rd magazine in the list |
| 3 | Choose to delete | Deletes the magazine and shows the list with the remaining magazines |

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| --- | --- |
| **Use case** | **Manage librarians** |
| **Summary** | The library manager hires or fires a librarian, and therefore they need to be added or removed from the system. In case they want to add a new librarian, they will use the system to record all the information about it: social security number (ssn), first and last name, date of employment and their password (see non-functional requirement c). The system validates and records the data.  On the other hand, if they want to delete it, they will have to select the librarian and use the system to delete it. The library manager can see the system updated with the operation (add or remove) that they have just performed. |
| **Actor** | Library manager |
| **Precondition** | The library manager is logged in the system.  In case of removing a librarian, it must be stored in the system. |
| **Postcondition** | The librarian is added/removed from the system. |
| **Base sequence** | 1. System displays a list of all the librarians stored in the system.  CASE ADD:   1. Insert librarian information (social security number (ssn), first and last name and their password) and add it. (ES 1) 2. System shows the updated list.   CASE REMOVE:  2. Select the librarian from the list and delete it.  3. The system displays the list with the  remaining librarians. |
| **Exception sequence** | ES 1: the information is incomplete or against the system restrictions:  3a. System will display and error (see notes) and ask for the information to  be introduced again  Go back to main flow, case add step 2. |
| **Note** | Regarding ES 1, the errors the system might display are:  First name can’t be null  Last name can’t be null  Social security number can’t be null  Password can’t be null  First name must be less than 50 characters  Last name must be less than 50 characters  Password must be less than 20 characters  There is already a librarian with that ssn in the system  This use case fulfills the requirements 2, 5 |