System Requirements Specification: Library Management System

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1. Description of the Subject Area

The subject area is library management, tracking books and related processes.

The system allows librarians to manage book details and status, and clients to borrow books and view availability.

The website is online, requires authorization, is easy to use, and has an intuitive design.
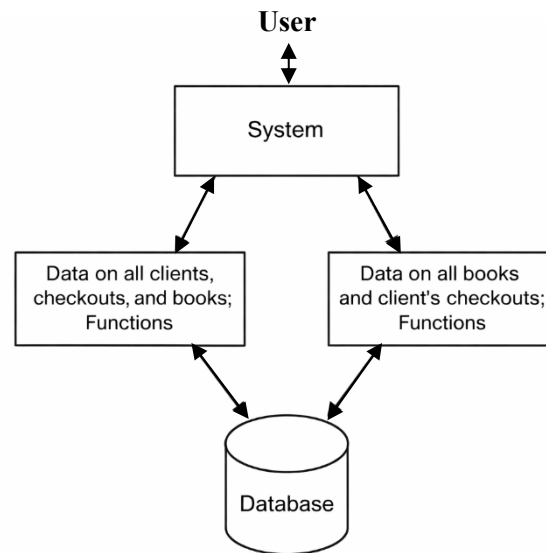
2. Simplified System Model

User

System

Data on all clients, checkouts, and books; Functions

Data on all books and client's checkouts; Functions

Database

Figure 1. Simplified system model diagram

3. Description of the System Model

1. User logs in with username and password.
2. The system provides access according to role (client or librarian).
3. The system retrieves and edits/adds data in the database.
4. The system updates the data.
5. The user receives updated information.
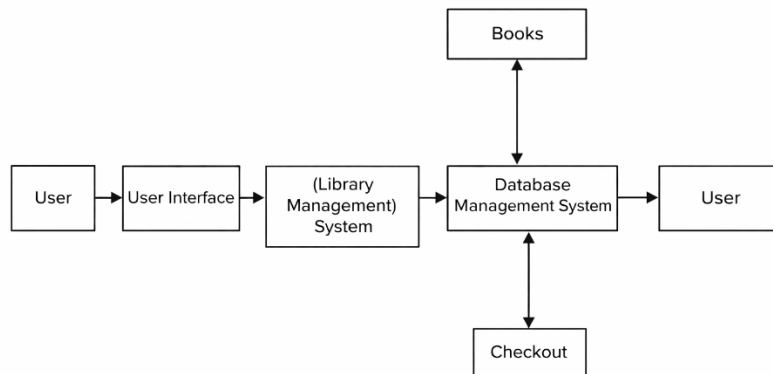
4. System Environment Diagram

Figure 2. System environment diagram

5. Description of the System Environment Diagram

Interaction with the user occurs through the interface. After authorization, the user accesses system functions.

The system interacts with the database containing information about books, users, and borrowings. Modified data is sent back to the program and displayed to the user.

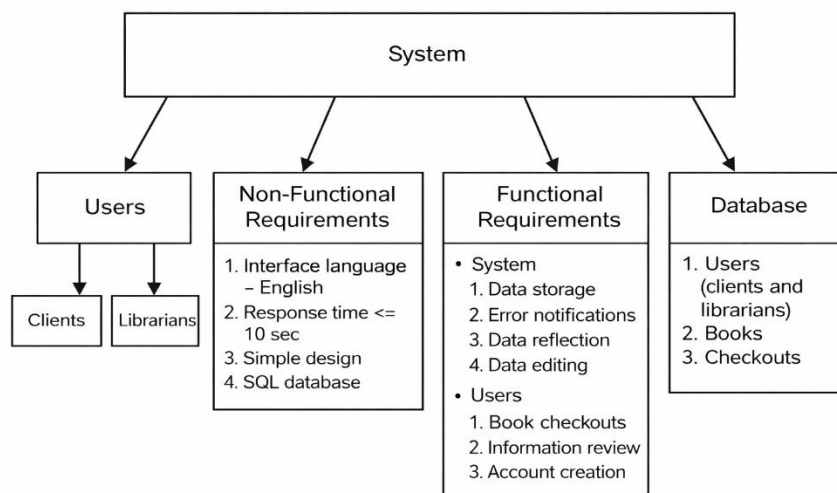# 6. Hierarchical View Diagram

Figure 3. Hierarchical view diagram

The subject area was explored. The information obtained can be divided into opinions that cover areas such as:

- Opinions about users and their classes - clients and librarians - who have their own capabilities and functions;
- Opinions about non-functional requirements;
- Opinions about functional requirements: system functions and functions available to users;
- Opinions about the database and its objects.

7. Tabular Diagrams of Opinions

8.1. System opinion

Source	Input	Process	Output	Place of Assignment
User	User registration information: • username • password • personal ID number • phone number • email	User registration in database	• User account creation • Error message	Screen, database
User	User authorization information: • username • password	User authorization	• User access to the system • Error message	Screen
User	Previously entered data: • books • borrowing	Data saving	• Data displayed in table form • Data saved in database • Error message	Screen
Users	Entered data: • customer information	Data saving	• Data displayed in table form (for librarian)	• Display of customer information for librarian • Error message

8.2. User – client opinion

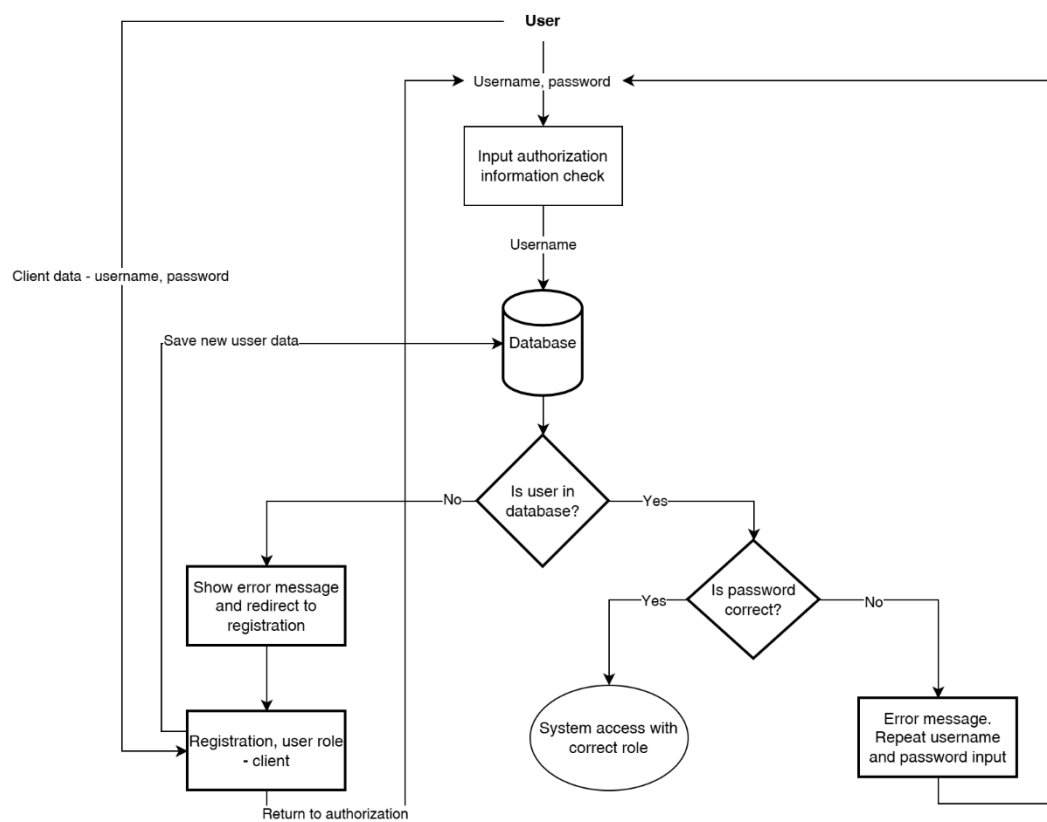| Source	Input	Process	Output	Place of Assignment
Client	No input data	Data request	Data output from the database (all available books)	Screen
Client	All previously entered data	Display of borrowed books	The user has clear and accessible data about their borrowed books	Screen
Client	Borrowing date	Data saving	Borrowing data saved in the database	Screen, database
Client	None	Display of books	The user has clear and accessible data about all books	Screen

8.3. User – librarian opinion

Source	Input	Process	Output	Place of Assignment
Librarian	None	Display of clients	The user has clear and accessible data about all clients	Screen
Librarian	New book data: • title • author • publication year	Save book	• The new book is saved in the database • The new book is displayed together with all other books • Errors	Screen, database
Librarian	New book data (continued): • year • description (optional) • available quantity	Notification	—	—
Librarian	None	Display of books	The user has clear and accessible data about all books	Screen

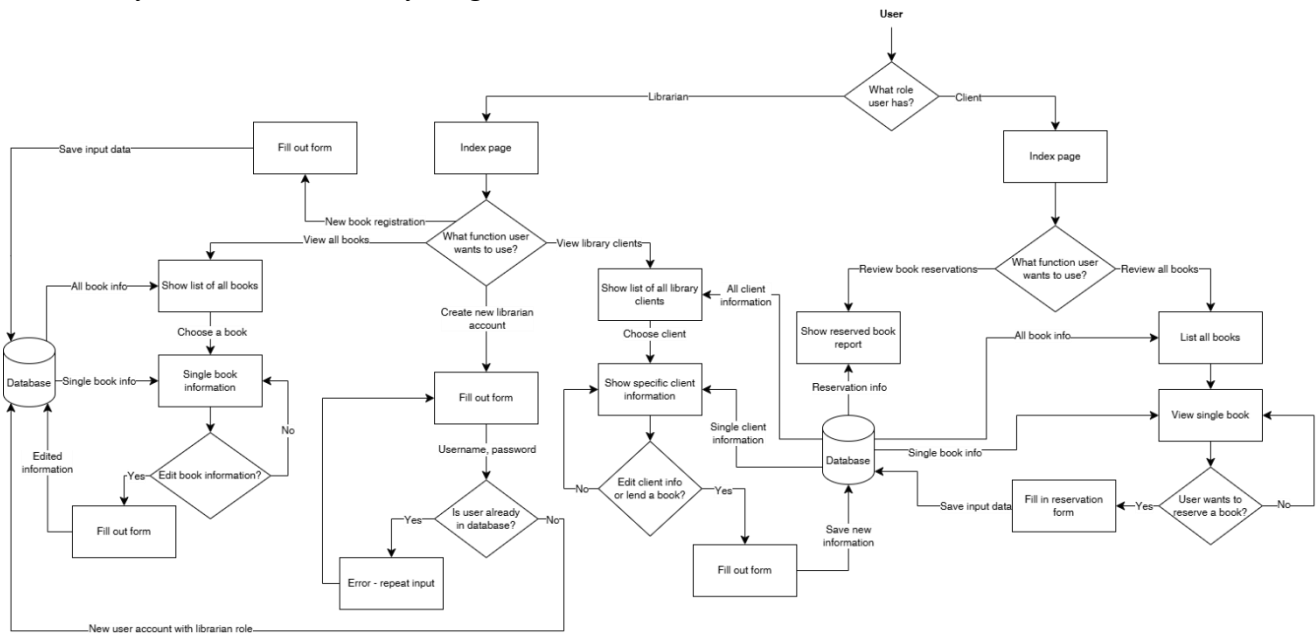| Librarian	New librarian account data: • username • password	Create and save new librarian account in database	• New librarian account is registered • Error message	Screen, database

8. Activity Diagrams

9.1. User registration/authorization activity diagram

4. attēls. User registration/authorization activity diagram

9.2. System function acivity diagram

5. attēls. Function activity diagram.

9. System Requirements

10.1.   Functional requirements

1.   User Classification.

    1.1.   User – Librarian.

    1.2.   User – Client.

2.   User Access to the System.

    2.1.   Creation of a client user account – using a username, password, phone number, email address, and personal identification number, an account is created and stored in the database.

    2.2.   Creation of a librarian user account – another librarian creates accounts for other librarians by entering a username and password.

    2.3.   User authorization – the user is authorized using a username and password.

3.   Functions Available to a Logged-In User.

    3.1.   Client – borrowing books. By specifying the return date, the client user can borrow a book, which means that until the specified date the book appears on their "borrowed books" page.

    3.2.   Client – overview of borrowed books. The client user can view all borrowed books in a table format. By clicking on a table cell, detailed information about the book can be viewed.

    3.3.   Librarian – adding new books. The librarian user can enter a new book into the system by specifying its title, author, year of publication, a short description (optional), and the available quantity.

    3.4.   Librarian – editing book information. The librarian user can edit information about books.

    3.5.   Librarian – overview of all clients. The librarian user can view all clients and their activities with books.

    3.6.   Librarian – overview of a single client and book assignment. The librarian user can view a client's full information and assign books to them.

    3.7.   Librarian – creation of new librarian accounts. The librarian user can create accounts for other librarians by entering a username and password in a form.

    3.8.   All users – ability to search for books by entering the title or author.

    3.9.   All users – book overview. All books registered in the library are displayed in a table format with their availability status. By clicking on a table cell, detailed information about the book can be viewed.

    3.10.   All users – single book overview. By selecting a book, its information can be reviewed – title, author, year of publication, short description (if provided), and available quantity. This page also provides the option to borrow the book.

    3.11.   A client may not borrow more than one copy of the same book.

    3.12.   A client may not borrow a book for more than one month.

10.2. Non-Functional Requirements.

1.   Website Requirements.

    1.1.   System interface language – Latvian.

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      1.2.   Design – simple, similar to Windows 98.

      1.3.   No advertisements.

      1.4.   Response time less than 10 seconds.

2.   Process Requirements.

      2.1.   System development languages – optional.

      2.2.   Database implementation – SQL.

      2.3.   The website must be suitable for desktops, phones, and tablets.

      2.4.   Deadline – none.