**ASSIGNMENT 1 FRONT SHEET**

|  |  |  |  |
| --- | --- | --- | --- |
| **Qualification** | **BTEC Level 5 HND Diploma in Computing** | | |
| **Unit number and title** |  | | |
| **Submission date** |  | **Date Received 1st submission** |  |
| **Re-submission Date** |  | **Date Received 2nd submission** |  |
| **Student Name** |  | **Student ID** |  |
| **Class** |  | **Assessor name** |  |
| **Student declaration**  I certify that the assignment submission is entirely my own work and I fully understand the consequences of plagiarism. I understand that making a false declaration is a form of malpractice. | | | |
|  |  | **Student’s signature** |  |

**Grading grid**

|  |
| --- |
| Grade (0-10) |
|  |

|  |  |  |
| --- | --- | --- |
| **❒ Summative Feedback ❒ Resubmission Feedback** | | |
| **Grade** | **Assessor Signature** | **Date** |
| **IV Signature** | | |

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**OVERVIEW**

## **Introduce the problem**

Faced with today's rapidly developing society, combined with the specific field of study that requires constantly cultivating knowledge of new technology and techniques, the reading needs of UIT students are increasing day by day. , requires the amount of imported books to be guaranteed and new books to be regularly updated. Since then, the school library's workload has increased, creating a need to create a *Library Management software* that fully meets the needs of administrators as well as students.

* 1. **Purpose and requirements of the topic**
     1. **Purpose**
* Minimize the amount of manual work, save time
* Increase productivity in data entry and reporting
* Increase security and efficiency in management
  + 1. **Subjects of use**

This software is for managers, librarians and collaborators - those responsible for managing book information and readers of the UIT library.

* + 1. **Request**
* The program's interface is designed reasonably, clearly and conveniently for users.
* The program's processing speed is good, meeting a large amount of work in an acceptable amount of time.
* Transactions must be recorded and processed properly by the program.
* Users can adjust and update information and regulations.

## **Implementation process**

Within the framework of this subject project, we divide the *Library Management software development process* into the following main stages:

* Phase 1: Identify and model software requirements.
* Phase 2: Analysis and design.
  + Phase 2.1: Analyze and sketch the components of the software.
  + Phase 2.2: System design.
  + Phase 2.3: Database design.
  + Phase 2.4: Interface design.
* Phase 3: Installation.
* Phase 4: Testing and fixing errors.

# **IDENTIFY AND MODEL SOFTWARE REQUIREMENTS**

* 1. **Categorize software requirements**
     1. *Professional requirements*

Board 2. 1: Professional requirements

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **No** | **Job** | **Type of work** | **Form** | **Regulations** | **Note** |
| first | Create a reader card | Storage | BM1 | Decision 1 |  |
| 2 | Receive new books | Storage | BM2 | Decision 2 |  |
| 3 | Look up books | Search | BM3 |  |  |
| 4 | Lend books | Storage | BM4 | Decision 4 |  |
| 5 | Receive books back | Storage | BM4 | Decision 5 |  |
| 6 | Make a fine collection slip | Calculate | BM6 | Decision 6 |  |
| 7 | Report | Rendering | BM7.1, BM7.2 |  |  |

* + 1. *Quality requirements*
       1. *Requires evolution*

Board 2. 2: Requires evolution

|  |  |  |  |
| --- | --- | --- | --- |
| **No** | **Content** | **Detailed description** | **Note** |
| first | Change the minimum and maximum age rules for readers. |  |  |
| 2 | Change the validity period of reader cards. |  | Users can choose to only apply to reader cards registered after the change date, or to all cards. |
| 3 | Change regulations on calculating fines. | Users can change the penalty price (calculated in days). |  |
| 4 | Updated list of categories. | Users can change existing category names, add or delete categories. |  |
| 5 | Update the list of reader types. | Users can change the name of an existing reader type, add or delete reader types. |  |
| 6 | Change the publication year gap. |  |  |
| 7 | Change the maximum number of books to borrow and the maximum number of days to borrow. |  |  |
| 8 | Change regulations on making fine collection slips | Users can change the rules: whether the amount collected exceeds the amount owed or not |  |
| 9 | Change the user group list. Change the list of permissions for each user group | User groups can be added, deleted, and edited. For each user group, permissions of that user group can be added and removed. |  |

* + - 1. *Convenience request*

Board 2. 3: Convenience request

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Major** | **Easy to learn level** | **Ease of use** | **Note \_** |
| first | Create a reader card | 5 minutes tutorial |  |  |
| 2 | Create a new book information sheet | 5 minutes tutorial |  |  |
| 3 | Look up books | No instructions needed | No need to know much about books |  |
| 4 | Make a book loan form | 5 minutes tutorial |  |  |
| 5 | Receive books back | 5 minutes tutorial |  |  |
| 6 | Make a fine collection slip | 5 minutes tutorial |  |  |
| 7 | Make a report | 5 minutes tutorial | Don't know much about making reports |  |
| 8 | Change regulations | 5 minutes tutorial | Just enter changes and save. |  |

* + - 1. *Compatibility requirements*

Board 2. 4: Compatibility requirements

|  |  |  |  |
| --- | --- | --- | --- |
| **No** | **Major** | **Related subjects** | **Note** |
| first | Make a fine collection slip | Export to PDF file, export to printer |  |
| 2 | Report | Export to Excel file, export to printer. |  |
| 3 | Create a reader card | Output to printer. |  |

* + - 1. *Effective requirements*

Board 2. 5: Effective requirements

|  |  |  |
| --- | --- | --- |
| **No** | **Major** | **Software processing time** |
| first | Create a reader card | Right away |
| 2 | Make a book information sheet | Under 5 seconds |
| 3 | Make a book loan form | Under 5 seconds |
| 4 | Report | Under 10 seconds |
| 5 | Make a fine collection slip | Under 5 seconds |
| 6 | Look up books | Under 10 seconds |

* + 1. *System requirements*
       1. *Confidentiality required*

Divide users into 2 user groups: managers and librarians. Each user group has the following rights:

Board 2. 6: Security required

|  |  |  |  |
| --- | --- | --- | --- |
| **No** | **Major** | **Manage** | **Librarian** |
| first | Assign permissions to users | X |  |
| 2 | user management | X |  |
| 3 | Change regulations | X |  |
| 4 | Manage book loan and return tickets | X | X |
| 5 | Report | X | X |
| 7 | Make a fine collection slip | X | X |
| 8 | Reader management | X | X |
| 9 | Look up books | X | X |

* + - 1. *Safety requirements*

*Table 2 . 7 : Safety requirements*

|  |  |  |  |
| --- | --- | --- | --- |
| **No** | **Major** | **Object** | **Note** |
| first | Delete | Existing readers, existing books |  |
| 2 | Deleting readers is not allowed | Readers still borrow books or still owe money |  |
| 3 | Deletion of book titles is not allowed | The book is still on loan |  |
| 4 | Removing Permissions and User Management permissions is not allowed | User Group Management |  |
| 5 | Additional User Delegation and Management permissions are not allowed | User groups are not Management user groups |  |

* 1. **Responsibility table for each request type**
     1. *Professional requirements*

Board 2. 8: Responsibility table for business requirements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Major** | **User** | **Software** | **Note** |
| first | Create a reader card | Provide reader information | Check card making regulations |  |
| 2 | Delete a book title | Provide information about the books to be deleted | Check regulations and update the quantity of books. |  |
| 4 | Receive new books | Provide book information | Check the regulations for importing new books |  |
| 5 | Look up books | Provide book information. | Find and export relevant information |  |
| 6 | Lend books | Provide book information. | Update the borrowed status of the book. |  |
| 7 | Receive books back | Provide book information. | Update the status of the book (not yet borrowed). |  |
| 8 | Make a fine collection slip | Provide information about fines. | Check regulations on collections and debts, update data. |  |
| 9 | Report | Provide information about the report | Display corresponding report data. |  |

* + 1. *Requires evolution*

Board 2. 9: Responsibility table for evolution requirements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Major** | **User** | **Software** | **Note** |
| first | Change the minimum and maximum age rules for readers. | Indicates the minimum and maximum age | Record new value. |  |
| 2 | Change the validity period of reader cards. | Indicates the new expiration date of the reader card | Record new value and change expiry date of existing cards (if required). |  |
| 3 | Change regulations on calculating fines. | Indicate the penalty amount/per day late. | Update the new fine value and change the fine calculation method. |  |
| 4 | Updated list of categories. | Indicates categories that need to be added/removed. | Record new values and update the list of categories. |  |
| 5 | Update list of authors | Indicates authors that need to be added/removed | Record new values and update the list of authors |  |
| 5 | Change the publication year gap. | Indicates the new publication year gap. | Record the new value and change the test method. |  |
| 6 | Change the maximum number of books to borrow and the maximum number of days to borrow. | Indicates the maximum number of books to borrow and the new maximum number of days to borrow. | Record new values and change the way of checking overdue books and the number of books borrowed. |  |
| 7 | Change regulations on making fine collection slips | Indicates whether it is possible to collect more money than the reader currently owes | Record new values and change the way of checking fine amounts. |  |
| 8 | Change the user group list | Indicates which user groups need to be added/removed | Record the new value and update the user group list |  |
| 9 | Change the permission list of a user group | Indicate the user group that needs to be edited, and indicate the permissions that need to be added/deleted | Record the new value and update the list of rights of that user group. |  |

* + 1. *Convenience request*

Board 2. 10: Convenient table of responsibility requirements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Major** | **User** | **Software** | **Remember** |
| first | Create a reader card | Read the user manual. | Follow the request correctly |  |
| 2 | Create a new book information sheet | Read the user manual. | Follow the request correctly. |  |
| 3 | Look up books |  | Follow the request correctly. |  |
| 4 | Make a book loan form | Read the user manual. | Follow the request correctly. |  |
| 5 | Make a fine collection slip | Read the user manual. | Follow the request correctly. |  |
| 6 | Make a report | Read the user manual. | Follow the request correctly. |  |
| 7 | Change regulations | Read the user manual. | Follow the request correctly. |  |

* + 1. *Compatibility requirements*

Board 2. 11: Compatible request responsibility table

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Major** | **User** | ***Software*** | ***Note*** |
| first | Make a fine collection slip | Indicates which receipt will be printed. Prepare the printer. | Follow the instructions exactly |  |
| 2 | Report | Indicate which report you want to create. Prepare the printer. | Follow the instructions exactly. |  |
| 3 | Create a reader card | Indicates new reader information. Prepare the printer | Follow the instructions exactly. |  |

* + 1. *Effective requirements*

Board 2. 12: Effective requirement responsibility table

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Major** | **User** | **Software** | **Remember** |
| first | Create a reader card | Prepare reader information in advance | Follow the instructions exactly. |  |
| 2 | Make a book information sheet | Prepare book information in advance | Follow the instructions exactly. |  |
| 3 | Make a book loan form | Prepare a list of borrowed tickets in advance | Follow the instructions exactly. |  |
| 4 | Report |  | Follow the instructions exactly. |  |
| 5 | Make a book return slip | Prepare book return information in advance. | Follow the instructions exactly. |  |
| 6 | Make a fine collection slip |  | Follow the instructions exactly. |  |
| 7 | Look up books |  | Follow the instructions exactly. |  |

* + 1. *Confidentiality required*

Board 2. 13: Responsibility table for security requirements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Major** | **User** | **Software** | **Note** |
| first | Manager | Provide account name and password. | Record and execute correctly |  |
| 2 | Librarian | Provide account name and password | Record and execute correctly |  |
| 3 | Readers | Provide account name and password. | Record and execute correctly |  |

* + 1. *Safety requirements*

Board 2. 14: Responsibility table for safety requirements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Major** | **User** | **Software** | **Note** |
| first | Erase | Indicates the reader/book title that needs to be deleted. | Follow the request correctly |  |
| 2 | Deleting readers is not allowed |  | Follow the request correctly |  |
| 3 | Deletion of book titles is not allowed |  | Follow the request correctly |  |
| 4 | Removing Permissions and User Management permissions is not allowed |  | Follow the request correctly |  |
| 5 | Additional User Delegation and Management permissions are not allowed |  | Follow the request correctly |  |

* 1. **Data flow diagram and processing algorithm**
     1. *Request a reader card*

1. Form 1 and regulation 1

|  |  |  |  |
| --- | --- | --- | --- |
| **BM1:** | **Readers Card** | | |
| First and last name: | | Reader Type: | Date of birth: |
| Address: | | Email: | Card creation date: |

Decision 1: There are 2 types of readers (X, Y). Readers' ages range from 18 to 55. Cards are valid for 6 months.

1. Data flow diagram

Ảnh có chứa văn bản, biểu đồ, ảnh chụp màn hình, Bản vẽ kỹ thuật

Mô tả được tạo tự động

Image 2. 1: Work data flow diagram Create reader cards

1. Describe the data flow

* D1: Full Name, Reader Type, Date of Birth, Address, Email, Card Creation Date.
* D2: None
* D3: List of Reader Types, Maximum Age, Minimum Age, Expiry Date.
* D4: D1 + Expiration Date.
* D5:D4
* D6: None

1. Processing algorithm

* B1: Receive D1 from the user.
* Step 2: Connect to the database.
* B3: Read D3 from secondary memory.
* B4: Check if “Reader Type” (D1) belongs to “Reader Type List” (D3).
* Step 5: Calculate the age of readers.
* B6: Check the minimum age regulation.
* B7: Check the maximum age regulation.
* Step 8: If one of the above conditions is not met, go to Step 13.
* B9: Calculate Expiration Date.
* Step 10: Save D4 to secondary memory.
* Step 11: Export D5 to printer (if required).
* Step 12: Close the database connection.
* B13: Finish.
  + 1. *Request to receive new books*

1. Form 2 and regulation 2

|  |  |  |  |
| --- | --- | --- | --- |
| **BM2:** | **Book Information** | | |
| Book title: | | Category: | Author: |
| Publishing year: | | Publishing company: | Date Added: |
| Value: | | The number of import: | Into money: |

Decision 2: There are 3 categories (A, B, C). There are 100 authors. Only accept books published within 8 years.

1. Data flow diagram

Ảnh có chứa biểu đồ, văn bản, Bản vẽ kỹ thuật, Kế hoạch

Mô tả được tạo tự động

Image 2. 2: Work data flow diagram Receiving new books

1. Describe the data flow
   * D1: Information about the book to import: Book name, Genre, Author, Year of publication, Publisher, Import date, Value, Import quantity
   * D2: None
   * D3: Genre list, Author list, Maximum publication year gap.
   * D4: D1
   * D5: D4
   * D6: None
2. Processing algorithm

* B1: Receive D1 from the user.
* Step 2: Connect to the database.
* B3: Read D3 from secondary memory.
* Step 4: Check if "Author" (D1) belongs to the "Author list" (D3).
* Step 5: Check if "Genre" (D1) belongs to "List of genres" (D3).
* B6: Calculate the publication year gap.
* B7: Check the publication year gap regulation.
* Step 8: If one of the above conditions is not met, go to Step 12.
* Step 9: Save D4 to secondary memory.
* Step 10: Export D5 to printer (if required).
* Step 11: Close the database connection.
* Step 12: Finish.
  + 1. *Ask to look up books*

1. Form 3

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| BM3: | | List of Book Titles | | | | |
| No | Book Title Code | | Book Title Name | Category | Author | SL remaining |
| first |  | |  |  |  |  |
| 2 |  | |  |  |  |  |

1. Data flow diagram

Diagram

Description automatically generated

Image 2. 3: Work data flow diagram Look up books

1. Describe the data flow

* D1: Search criteria (book title, title code, genre, author,...).
* D2: None.
* D3: List of books (Including title code, book name, genre, author, remaining quantity).
* D4: None.
* D5: List of books (Including title code, book name, genre, author, remaining quantity) that meet D1 standards.
* D6: D5.

1. Processing algorithm

* B1: Receive D1 from the user
* Step 2: Connect to the database
* B3: Read D3 from secondary memory
* Step 4: Export D5 to the printer
* B5: Return D6 to the user
* Step 6: Close the database connection
* Step 7: Finish
  + 1. *Request to borrow books*

1. Form 4 and regulation 4

|  |  |  |
| --- | --- | --- |
| BM4: | Book Loan Voucher | |
| Reader code: | | Reader name: |
| Book code: | | Book title:  Author:  Category: |
| Borrowing date: | | Payable date: |
| Pay day: | | Number of days of late payment: |
| Fine amount: | | Total reader debt: |

Rule 4: Only lend with a valid card, no overdue books, and books that no one is borrowing. Each reader can borrow up to 5 books in 4 days.

1. Data flow diagram

Diagram

Description automatically generated

Image 2. 4: Business data flow diagram Book lending

1. Describe the data flow

* D1: Reader code, book code, loan date
* D2: None
* D3: Book information corresponding to the book code, reader information corresponding to the reader code (full name, card expiration date, list of tickets for books being borrowed), maximum number of books that can be borrowed.
* D4: New loan slip (including D1 + book name, author, genre + reader's name + due date).
* D5:D4
* D6: None

1. Processing algorithm

* B1: Receive D1 from the user
* Step 2: Connect to the database
* B3: Read D3 from secondary memory
* Step 4: Check the following conditions, if any condition is not met, go to Step 12.
* Step 5: Check if the book has not been borrowed yet.
* Step 6: Check if the reader card is still valid or not.
* B7: Check if the number of books being borrowed by the reader is less than the maximum number of books borrowed (D3).
* Step 8: Check if any borrowed books (D3) are overdue.
* Step 9: Calculate payable date
* Step 10: Save D4 to secondary memory.
* Step 11: Export D5 to the printer
* Step 12: Close the database connection
* B13: Finish.
  + 1. *Request to return books*

1. Regulation 5

Decision 5: For each day of late payment, the penalty is 1,000 VND/day.

1. Data flow diagram

Diagram

Description automatically generated

Image 2. 5: Job data flow diagram Receiving and returning books

1. Describe the data flow

* D1: Returned book code, book return date.
* D2: None.
* D3: Latest loan information corresponding to the returned book code and the reader's total old debt.
* D4: D1 + D3 + Number of days late + Fine + Reader's total new debt.
* D5: D4
* D6: None

1. Processing algorithm

* B1: Receive D1 from the user.
* Step 2: Connect to the database.
* B3: Read D3 from secondary memory.
* Step 4: Calculate the number of days of late payment, calculate the penalty amount, and calculate the reader's total new debt.
* Step 5: Save D4 to secondary memory.
* Step 6: Export D5 to the printer.
* Step 7: Close the database connection.
* B8: Finish.
  + 1. *Request to make a fine collection slip*

1. Form 6 and regulation 6

|  |  |
| --- | --- |
| BM6: | Fine Collection Voucher |
| Reader code:  Reader's name: | |
| Total liabilities: | |
| Proceeds: | |
| Remaining: | |

Rule 6: The amount collected must not exceed the amount the reader owes.

1. Data flow diagram

Ảnh có chứa văn bản, biểu đồ, Phông chữ, ảnh chụp màn hình

Mô tả được tạo tự động

Image 2. 6: Work data flow diagram Making fine collection slips

1. Describe the data flow

* D1: Reader code, collected amount
* D2: None
* D3: Reader information (Full name, total current debt)
* D4: D1 + Reader's full name + Total remaining debt
* D5:D4
* D6: None

1. Processing algorithm

* B1: Receive D1 from the user
* Step 2: Connect to the database
* B3: Read D3 from secondary memory
* B4: If the collected amount is greater than the current debt amount (D3), go to B8
* Step 5: Calculate the total remaining debt
* Step 6: Save D4 to secondary memory
* Step 7: Export D5 to the printer
* Step 8: Close the database connection
* B9: Finish
  + 1. *Request a report*

1. Form 7

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **BM7.1** | | **Report on Book Borrowing Statistics by Genre** | | |
| May : . …… | | | | |
| **No** | **Category Name** | | **Number of Loans \_ \_** | **Ratio \_ \_** |
| first |  | |  |  |
| 2 |  | |  |  |
| Total number of loans: | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **BM7.2** | | **Late Returned Book Statistics Report** | | |
| Day: ……….. | | | | |
| **No** | **Book title** | | **Borrowed Day** | **Number of Days Late** |
| first |  | |  |  |
| 2 |  | |  |  |

1. Data flow diagram

Ảnh có chứa biểu đồ, văn bản, hàng, Bản vẽ kỹ thuật

Mô tả được tạo tự động

Image 2. 7: Work data flow diagram Prepare a report on book borrowing situation by genre

Ảnh có chứa văn bản, biểu đồ, ảnh chụp màn hình, Kế hoạch

Mô tả được tạo tự động

Image 2. 8: Work data flow diagram Prepare a statistical report on late books

1. Describe the data flow

* Description of data flow reporting statistics on book borrowing by genre:
* D1: Month + Year
* D2: None
* D3: List of borrowed tickets with the borrowed date of the month (D1)
* D4: D1 + statistical information for each genre with loans in the month (genre name, number of loans, loan rate) + total number of loans.
* D5: D4
* D6: D5
* Describe the data flow of the late book statistics report
* D1: Report date
* D2: None
* D3: List of loans with a return date of NULL and a payable date greater than the report date (D1)
* D4: D1 + statistical information about the total number of books returned late (Book name, Date borrowed, Number of days returned late).
* D5:D4
* D6: D5

1. Processing algorithm

* Processing algorithm to create statistical reports on book borrowing by genre:
* B1: Receive D1 from the user
* Step 2: Connect to the database
* B3: Read D3 from secondary memory
* B4: Count the number of loans by each category from the list of loans in the month (from D3).
* Step 5: Calculate the total number of loans of all genres (≠ number of loans).
* B6: Calculate the borrowing rate for each genre based on the number of borrowings of each genre and the total number of borrowings of all genres.
* Step 7: Save D4 to secondary memory
* Step 8: Export D5 to the printer
* B9: Return D6 to the user
* Step 10: Close the database connection
* Step 11: Finish
* Processing algorithm for making statistical reports on late payment books:
* B1: Receive D1 from the user
* Step 2: Connect to the database
* B3: Read D3 from secondary memory
* Step 4: Find late payment books (from D3).
* Step 5: Save D4 to secondary memory
* Step 6: Export D5 to the printer
* Step 7: Return D6 to the user
* Step 8: Close the database connection
* B9: Finish
  + 1. *Request to change regulations*

1. Regulation 8

QD8: Users can change the regulations as follows:

+ Decision 1: Changes in minimum age, maximum age, and validity period of the card.

+ Decision 2: Change the number and names of categories. Change the publication year gap.

+ Decision 3: Change the maximum number of books to borrow and the maximum number of days to borrow. Change the penalty price

+ Decision 4: Change regulations on checking collected amounts

+ Decision 5: Change user group list

1. Data flow diagram

Diagram

Description automatically generated

Image 2. 9: Job data diagram Change regulations

1. Describe the data flow

* D1: Information to be changed and its new value.
* D2: None
* D3: Information is changed.
* D4: D1
* D5: None
* D6: None

1. Algorithm

* B1: Receive D1 from the user
* Step 2: Connect to the database
* Step 3: Save D4 to secondary memory
* Step 4: Close the database connection
* Step 5: Finish
  + 1. *Request authorization*

1. Regulation 9

QD9: Users belonging to the Management user group can add and delete permission functions of user groups

1. Data flow diagram

Diagram

Description automatically generated

Image 2. 10: Work data flow diagram Decentralization

1. Describe the data flow

* D1: User group needs to edit permissions, functions added/deleted
* D2: None
* D3: List of user groups, list of functions
* D4: D1
* D5: None
* D6: None

1. Processing algorithm

* B1: Receive D1 from the user
* Step 2: Open the database connection
* B3: Read D3 from secondary memory
* Step 4: Check whether the user group (D1) belongs to the list of user groups (D3) or not. If not, go to B7.
* Step 5: Check whether the added/deleted functions (D1) are in the list of functions (D3). If not go to B7.
* Step 6: Save D4 to secondary memory
* Step 7: Close the database connection
* B8: Finish

1. **SYSTEM DESIGN**
   1. ***system architecture***

* Using three-layer architecture. The application is divided into 3 main parts as follows:
  + Presentation layer (GUI): This is the top layer, responsible for interacting directly with the user, receiving user requests and using responses from the BUS layer to display results to the user.
  + Business Logic (BUS) layer: This is the layer that uses the results returned from the DAL layer to process and respond to data manipulation requests from the GUI layer.
  + Data Access layer (DAL): This is the lowest layer, directly manipulating the database system.
* Principle of 3-layer architecture: A layer can only interact with the layer immediately below it. Do not interact "beyond the floor".
  1. ***Describe the components in the system***

|  |  |  |
| --- | --- | --- |
| **No** | **Ingredient** | **Explain** |
| first | GUI class | This layer performs tasks such as receiving user requests, entering data, displaying data, checking the correctness of data before calling the layer below, the Business Logic layer,... |
| 2 | BUS class | This class is responsible for checking constraints, correctness and integrity of data, using query data sources from the Data Access layer to perform calculations and process business requests and then return the results to the customer. GUI class. |
| 3 | DAL class | This class performs tasks such as querying (searching, adding, deleting, editing, etc.) and storing. |
| 4 | DTO class | (Data Transfer Object) This class is responsible for packaging data (from data set, data table into a class) to transfer between client and server. |

1. **DATA DESIGN**
   1. **Algorithm for creating logic diagrams:**
      1. *Step 1: Consider the request to create a reader card*

* Design data with correctness:
* Related form: BM1
* Data flow diagram: Figure 2.1
* New attributes: TenDocGia, MaLoaiDocGia, DateSinh, DiaChi, Email, DateLapThe.
* Data design: Table DOCGIA.
* Abstract properties: MaDocGia
* Logic diagram:

Ảnh có chứa văn bản

Mô tả được tạo tự động

* Design data with evolution in mind:
  + Related regulations: Decision 1
  + Data flow diagram: Figure 2 . 9 : Job data diagram Change regulations .
  + New attributes: TenLoaiDocGia, TuoiToiDa, TuoiToiThieu, ThoiHanThe, PhaoHetHan.
  + Data design: Table LOAIDOCGIA, Table THAMSO
  + Abstract properties: MaLoaiDocGia
  + Logic diagram:

Ảnh có chứa văn bản, ảnh chụp màn hình, Phông chữ, hàng

Mô tả được tạo tự động

* + 1. *Step 2: Consider the request to receive new books*
* Design data with correctness:
* Related form: BM2
* Data flow diagram: Figure 2 . 2 : Work data flow diagram Receiving new books
* New attributes: NhaXB, DonGia, NganNhap, SoLuong, TenTuaSach, NamXB, TacGia, TheLoai, SoLuongNhap, ThanhTien, TongTien
* Data design: Table PHIEUNHAPSACH, CT\_PHIEEUNHAP, TUASACH, SACH
* Abstract attributes: SoPhieuNhap, MaSach, MaTuaSach.
* Logic diagram:

Ảnh có chứa văn bản, ảnh chụp màn hình, Phông chữ, biểu đồ

Mô tả được tạo tự động

* Design data with evolution in mind:
* Related regulations: Decision 2
* Data flow diagram: Figure 2 . 9 : Job data diagram Change regulations
* New attributes: TenTheLoai, TenTacGia, ThoiHanNhanSach
* Data design: Table TACGIA, Table THELOAI, Table CT\_TACGIA, Table THAMSO
* Abstract properties: MaTacGia, MaTheLoai
* Logic diagram:

Ảnh có chứa văn bản, ảnh chụp màn hình, biểu đồ, Song song

Mô tả được tạo tự động

* + 1. *Step 3: Consider the request to look up books*
* Design data with correctness:
* Related form: BM3
* Data flow diagram: Figure 2 . 3 : Work data flow diagram Look up books
* New properties: SoLuongConLai
* Data design: Table SACH
* Abstract properties:
* Logic diagram:

Ảnh có chứa văn bản, ảnh chụp màn hình, biểu đồ, Song song

Mô tả được tạo tự động

* + 1. *Step 4: Consider the request to lend books*
* Design data with correctness:
* Related form: BM4
* Data flow diagram: Figure 2 . 4 : Book lending job data flow diagram
* New attributes: DoanhMuon, HanTra, TongNo, SoTienPhat, PhaoTra, TinhTrang
* Data design: Table PHIEUMUONTRA, Table DOCGIA, Table CUONSACH
* Abstract attributes: SoPhieuMuonTra, MaCuonSach
* Logic diagram:

Ảnh có chứa văn bản, ảnh chụp màn hình, biểu đồ, Phông chữ

Mô tả được tạo tự động

* Design data with evolution in mind:
* Related regulations: Decision 4
* Data flow diagram: Figure 2 . 9 : Job data diagram Change regulations
* New attributes: SoSachMuonToiDa, SongayMuonToiDa
* Data design: Table THAMSO
* Abstract properties:
* Data diagram:

Ảnh có chứa văn bản, ảnh chụp màn hình, biểu đồ, Song song

Mô tả được tạo tự động

* + 1. *Step 5: Consider the request to return the book*
* Design data with evolution in mind:
* Related regulations: Decision 5
* Data flow diagram: Figure 2 . 9 : Job data diagram Change regulations
* New properties: DonGiaPhat
* Data design: Table THAMSO
* Logic diagram:

Ảnh có chứa văn bản, ảnh chụp màn hình, biểu đồ, Song song

Mô tả được tạo tự động

* + 1. *Step 6: Consider the request to create a fine collection slip*
* Design data with correctness:
* Related form: BM6
* Data flow diagram: Figure 2 . 6 : Work data flow diagram Prepare fine collection slips
* New properties: SoTienThu, GiaiLap
* Data design: Table PHIEUTHU
* Abstract properties: SoPhieuThu
* Logic diagram:

Ảnh có chứa văn bản, ảnh chụp màn hình, biểu đồ, Song song

Mô tả được tạo tự động

* Design data with evolution in mind:
* Related regulations: Decision 6
* Data flow diagram: Figure 2 . 9 : Job data diagram Change regulations
* New attributes: AD\_QDKiemTraSoTienThu
* Data design: Table THAMSO
* Logic diagram:

Ảnh có chứa văn bản, ảnh chụp màn hình, biểu đồ, Song song

Mô tả được tạo tự động

* + 1. *Step 7: Consider reporting requirements*
* Design data with correctness:
* Related forms: BM7.1, BM7.2
* Data flow diagram: Reporting diagram
* New attributes: SoLuotMuon, TiLe, Phao, EvenMuon, SongayTraTre, Thang, Nam, TongSoLuotMuon.
* Data design: Table BCLUOTMUONTHEOTHELOAI, CT\_BCLUOTMUONTHEOTHELOAI, BCSACHTRATRE
* Logic diagram:

A picture containing text

Description automatically generated

* + 1. *Step 8: Consider the request for decentralization*
* Design data with security in mind:
* Related regulations: Decision 9
* Data flow diagram: Figure 2 . 10 : Work data flow diagram Decentralization
* New attributes: TenNhomNguoiDung, DateSinh, ChucVu, TenDangNhap, MatKhau, MaNhomNguoiDung, TenNhomNguoiDung, TenChucNang, TenManHinh
* Data design: Table PHANQUYEN, Table CHUCNANG, Table NGUOIDUNG, Table NHOMNGUOIDUNG
* Abstract attributes: MaNhomNguoiDung, MaNguoiDung, MaChucNang
* Logic diagram:

Diagram

Description automatically generated

* 1. **Complete logic diagram**

Diagram

Description automatically generated

* 1. **List of data tables in the diagram**

|  |  |  |
| --- | --- | --- |
| **No** | **Data table name** | **Explain** |
| first | THAMSO | The table contains parameters |
| 2 | READER | Contains reader information. |
| 3 | LOAIDOCGIA | Contains information about reader types. |
| 4 | NHOMNGUOIDUNG | Contains information about user groups. |
| 5 | CHUCNANG | Contains information about functions. |
| 6 | QUEN | Each set in the QUEN table contains information about a group of users who can use a certain function |
| 7 | NGUOIDUNG | Contains user information. |
| 8 | THELOAI | Contains book genre information. |
| 9 | TUASACH | A tuple in table TUASACH contains information about a book title. |
| ten | SACH | A set in the SACH table contains information about a book title in a particular edition. |
| 11 | CUONSACH | A tuple in the CUONSACH table contains information about a book. |
| twelfth | PHIEUNHAPSACH | Contains information about book import batches. |
| 13 | CT\_PHIEUNHAP | Contains detailed information of the book entry form |
| 14 | TACGIA | Contains author information. |
| 15 | PHIEUMUONTRA | A set belonging to PHIEUMUONTRA contains information about a check-out of a book. |
| 16 | PHIEUTHU | Contains information about receipts. |
| 17 | CT\_TACGIA | A set of CT\_TACGIA contains information about an author of a book title |
| 18 | BCLMUONTHEOTLOAI | Contains information about loan reports by category during the month. |
| 19 | CT\_BCLMUONTHEOTLOAI | Contains detailed information on loan reports by genre during the month |
| 20 | BCSACHTRATRE | Contains detailed information about late payment books by date |

* 1. **Description of each data sheet**
     1. *THAMSO table*

|  |  |  |
| --- | --- | --- |
| **THAMSO** | | |
| **Attribute name** | **Value** | **Explain** |
| TuoiToiThieu | 18 | Minimum age of readers |
| TuoiToiDa | 55 | Maximum age of readers |
| ThoiHanThe | 6 | Card validity period (in months) |
| KhoaCachXuatBan | 8 | Receive books published within the year |
| SoSachMuonToiDa | 5 | Maximum number of books to borrow |
| SoNowMuonToiDa | 4 | Maximum number of days to borrow books |
| DonGiaPhat | 1000 | Unit price for late payment penalty/1 day |
| AD\_QDKTTienThu | first | Is there a regulation to check that the amount collected does not exceed the amount owed? (0: no, 1: yes) |

* + 1. *DOCGIA table*

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute name** | **Datatypes** | **Constraint** | **Explain** |
| MaDocGia | Int | Main key | Reader code |
| TenDocGia | Varchar |  | Reader's name |
| EvenSinh | Datetime |  | Reader's date of birth |
| Address | Varchar |  | Reader address |
| Email | Varchar |  | Email readers |
| RightLapThe | Datetime |  | Date of creation of reader card |
| RightHetHan | Datetime |  | Reader card expiration date |
| MaLoaiDocGia | Int | Foreign key to LOAIDOCGIA table | Reader type code |
| TongNoHienTai | Int |  | Reader's total current debt |

* + 1. *LOAIDOCGIA table*

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute name** | **Datatypes** | **Constraint** | **Explain** |
| MaLoaiDocGia | Int | Main key | Reader type code |
| NameDocGia | Varchar |  | Reader type name |

* + 1. *TACGIA table*

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute name** | **Datatypes** | **Constraint** | **Explain** |
| MaTacGia | Int | Main key | Author code |
| TenTacGia | Varchar |  | The writer's name |

* + 1. *NHOMNGUOIDUNG table*

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute name** | **Datatypes** | **Constraint** | **Explain** |
| MaNhomNguoiDung | Int | Main key | User group code |
| NameNhomNguoiDung | Varchar |  | User group name |

* + 1. *CHUCNANG table*

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute name** | **Datatypes** | **Constraint** | **Explain** |
| MaChucNang | Int | Main key | Function code |
| TenChucNang | Varchar |  | Function name |
| TenManHinh | Varchar |  | The screen name is loaded |

* + 1. *PHANQUIYEN table*

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute name** | **Datatypes** | **Constraint** | **Explain** |
| MaNhomNguoiDung | Int | Main key  Foreign key in table NHOMNGUOIDUNG | User group code |
| MaChucNang | Int | Main key  Foreign key of CHUCNANG table | Function code that allows user groups to use |

* + 1. *NGUOIDUNG table*

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute name** | **Datatypes** | **Constraint** | **Explain** |
| MaNguoiDung | Int | Main key | User code |
| NameNguyenDung | Varchar |  | User name |
| EvenSinh | datetime |  | Date of birth |
| ChucVu | Varchar |  | Position |
| Username | varchar |  | User account login name |
| MatKhau | Varchar |  | User's password |
| MaNhom | Int | Foreign key in table NHOMNGUOIDUNG | User group code |

* + 1. *THELOAI table*

Contains a list of categories.

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute name** | **Datatypes** | **Constraint** | **Explain** |
| MaTheLoai | Int | Main key | Category code |
| TenTheLoai | Varchar |  | Category name |

* + 1. *TUASACH table*

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute name** | **Datatypes** | **Constraint** | **Explain** |
| MaTuaSach | Int | Main key | Book title code |
| TenTuaSach | Varchar |  | Book title name |
| MaTheLoai | Int | Foreign key in table THELOAI | Category code |

* + 1. *Table CT\_TACGIA*

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute name** | **Datatypes** | **Constraint** | **Explain** |
| MaTacGia | Int | Main key  Foreign key in table TACGIA | Author code |
| MaTuaSach | int | Main key  Foreign key to TUASACH table | Book title code |

* + 1. *SACH table*

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute name** | **Datatypes** | **Constraint** | **Explain** |
| MaSach | Int | Main key | Book code |
| MaTuaSach | int | Foreign key to TUASACH table | Book title code |
| SoLuong | Int |  | Quantity |
| SoLuongConLai | Int |  | Number of books not yet borrowed |
| Unit price | Int |  | Price of one book |
| NamXB | Int |  | Publishing year |
| NhaXB | Varchar |  | Imprint |

* + 1. *CUONSACH table*

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute name** | **Datatypes** | **Constraint** | **Explain** |
| MaCuonSach | Int | Main courses | Code book |
| MaSach | Int | Foreign key to SACH table | Book code |
| TinhTrang | bool |  | Book status (Borrowed: 1, Not borrowed: 0) |

* + 1. *PHIEUNHAPSACH table*

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute name** | **Datatypes** | **Constraint** | **Explain** |
| SoPhieuNhap | Int | Main key | Book entry number |
| TongTien | Int |  | Total cost of importing books |
| Nhap | Datetime |  | Book entry date |

* + 1. *Table CT\_PHIEUNHAP*

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute name** | **Datatypes** | **Constraint** | **Explain** |
| SoPhieuNhap | Int | Main courses  Foreign key to table PHIEUNHAPSACH | Book entry number |
| MaSach | Int | Main courses | Book code |
| SoLuong Nhap | Int |  | Number of imported books |
| Unit price | Int |  | Unit price of one book |
| ThanhTien | Int |  | into money |

* + 1. *PHIEUMUONTRA table*

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute name** | **Datatypes** | **Constraint** | **Explain** |
| SoPhieuMuonTra | Int | Main key | Number of borrowed and returned votes |
| MaDocGia | int | Foreign key in DOCGIA table | Reader code |
| MaCuonSach | int | Foreign key to table CUONSACH | Code book |
| RightMuon | Datetime |  | Book borrowing day |
| RightPhaiTra | Datetime | Not smaller than NOWMUON | Book return date |
| EvenTra | datetime | Not smaller than NOWMUON | Actual payment date |
| SoTienPhat | Int | Not negative | Late payment penalty amount |

* + 1. *PHIEUTHU board*

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute name** | **Datatypes** | **Constraint** | **Explain** |
| SoPhieuThu | Int | Main key | Receipt number |
| MaDocGia | Int | Foreign key in DOCGIA table | Reader code |
| SoTienThu | Int |  | Proceeds |
| DayLap | Datetime |  | The date of the vote |

* + 1. *Table BCLUOTMUONTHEOTLOAI*

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute name** | **Datatypes** | **Constraint** | **Speakers** |
| MaBaoCao | Int | Main courses | Report code |
| Ladder | Int |  | Month for which the report is required |
| Male | Int |  | Year for which the report is required |
| TongSoLuotMuon | Int |  | Total number of loans in the month and year above |

* + 1. *Table CT\_BCLUOTMUONTHEOTHELOAI*

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute name** | **Datatypes** | **Constraint** | **Speakers** |
| MaBaoCao | Int | Main courses | Report code |
| MaTheLoai | Int | Main courses  Foreign key in table THELOAI | Book genre code |
| SoLuotMuon | Int |  | Number of book borrowings by genre |
| TiLe | Numeric(4, 2) |  | Percentage of books borrowed according to this genre |

* + 1. *BCSACHTRATRE table*

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute name** | **Datatypes** | **Constraint** | **Speakers** |
| Right | Datetime | Main courses | Report date |
| MaCuonSach | Int | Main courses  Foreign key to table CUONSACH | Code book |
| RightMuon | Datetime |  | Book borrowing day |
| SongayTre | Int |  | Number of days late |

1. **DESIGN THE THEME**
   1. **Diagram linking the screens**

Graphical user interface

Description automatically generated

* 1. **List of screens**

|  |  |  |  |
| --- | --- | --- | --- |
| **No** | **Screen** | **Screen type** | **Function** |
|  | Login screen | Input | Log in to the software |
|  | Password change screen | Input | Allow users to change password |
|  | Management Home screen | Main screen | Allows users to perform management tasks |
|  | Account Information screen | Search | Display account information |
|  | Reader Management screen | Search | Displays a list of readers, allows searching for readers and accessing the features of adding and editing readers |
|  | Reader Information screen | Search | Displays reader information and borrowed books |
|  | Add Reader Card screen | Input | Add new readers |
|  | Reader Card Edit screen | Input | View and change reader information |
|  | Reader Type Management screen | Lookup, Data Entry | Displays a list of reader types, allowing adding and editing reader types |
|  | Title Management screen | Search | Displays a list of book titles, allows looking up book titles and accessing the features of adding, editing, and hiding book titles |
|  | Title Information screen | Search | Displays book title information and a list of books under the title |
|  | Add Title screen | Input | Add new titles |
|  | Edit book title information screen | Input | Change book title information |
|  | Book Management screen | Search | Displays a list of books, allows searching for books and accesses the functions of importing books and hiding books |
|  | Screen Add new book entry form | Input | Add a new book and import the new book |
|  | The Add book receipt screen is available | Input | Add import tickets for existing books |
|  | Book Management screen | Search | Displays the book list, allows searching and hiding books |
|  | Author Management screen | Lookup, Data Entry | Displays a list of authors, allowing adding and accessing the author editing function |
|  | Edit Author screen | Input | Display information and allow editing of author information |
|  | Category Management screen | Lookup, Data Entry | Displays a list of genres, allows adding new genres and accesses the genre editing function |
|  | Edit category screen | Input | Displays information and allows editing of category information |
|  | Book entry management screen | Search | Displays a list of book entry tickets |
|  | Book entry information screen | Search | Display information and details of input tickets |
|  | Loan and return management screen | Search | Displays the list of loan and return tickets, allowing you to select the function to add loan and return tickets |
|  | Loan/Return Voucher Information screen | Lookup, Data Entry | Display detailed loan and return information, allowing marking as paid |
|  | Fine collection ticket management screen | Search | Displays a list of receipts, allowing search and access to the function of adding receipts |
|  | Screen Add fine receipt | Input | Create a new fine receipt |
|  | Borrowing report screen by category by month | Reporting, Data Entry | Allows creating new reports, deleting reports and displaying report details |
|  | Screen Reporting late books by date | Reporting, Data Entry | Allows creating new reports and displaying report details |
|  | User Management screen | Search | Displays a list of users, allows searching for users and accessing the functions of adding, deleting, and editing users. |
|  | User Information screen | Search | Display user information |
|  | Add User screen | Input | Add new users |
|  | Edit user information screen | Input | Change user information |
|  | User Group Management screen | Search | Displays a list of user groups, allowing you to choose the function of adding, editing and deleting user groups |
|  | User Group Information screen | Search | Display detailed user group information |
|  | Add User Group screen | Input | Add a new user group |
|  | User group editing screen | Input | Change user group information |
|  | Change Rules screen | Lookup, Data Entry | Displays regulations and allows changes to those regulations |
|  | Reader Home screen | Main screen |  |
|  | Reader account information screen | Search | Displays reader information, information about borrowed books and allows changing passwords |
|  | Book lookup screen for readers | Search | Displays a list of books, allowing book searching. |

* 1. **Description of screens**
     1. *Login screen*

1. Display

Ảnh có chứa văn bản, ảnh chụp màn hình, phần mềm, màn hình

Mô tả được tạo tự động

1. Description of objects on screen:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Name** | **Type** | **Constraint** | **Function** |
| first | butLogin | Button |  | Log in to the software |
| 2 | txtUsername | Textbox |  | Enter your login name |
| 3 | txtUserpwd | Textbox |  | Enter your password |

1. List of events and corresponding handling on the screen:

|  |  |  |
| --- | --- | --- |
| **No** | **Incident** | **Handle** |
| first | When clicking on butLogin | Allows logging in to the user account with the entered username and password |
| 2 | When clicking on txtUsername | Allows users to enter their login name |
| 3 | When clicking on txtUserpwd | Allows users to enter a password |

* + 1. *Management Home screen*

1. Display

Ảnh có chứa văn bản, ảnh chụp màn hình, phần mềm, biểu đồ

Mô tả được tạo tự động

1. Description of objects on screen:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Name** | **Type** | **Constraint** | **Function** |
| first | tabControl | TabControl |  | Displays the menu of function screens |
| 2 | tabAccount | TabPage |  | User information and account management |
| 3 | tabQLDG | TabPage |  | Display the reader management screen |
| 4 | tabQLS | TabPage |  | Display the book management screen |
| 5 | tabQLMT | TabPage |  | Display the loan and return ticket management screen |
| 6 | tabQLPT | TabPage |  | Display the receipt management screen |
| 7 | tabBC | TabPage |  | Displays the statistical report screen |
| 8 | People Management tab | TabPage |  | Displays the user management screen |
| 9 | tabTDQD | TabPage |  | Displays the rule change screen |

1. List of events and corresponding handling on the screen:

|  |  |  |
| --- | --- | --- |
| **No** | **Incident** | **Handle** |
| first | When clicking on theAccount tab | Displays the Account Information screen |
| 2 | When clicking on the QLDG tab | Display the Reader Management screen |
| 3 | When clicking on the QLS tab | Displays the Book Management screen |
| 4 | When clicking on the QLMT tab | Display the Loan and Return Management screen |
| 5 | When clicking on the QLPT tab | Display the Voucher Management screen |
| 6 | When clicking on tabBC | Displays the statistical report screen |
| 7 | When clicking on the People Management tab | Displays the user management screen |
| 8 | When clicking on the TDQD tab | Displays the rule change screen |

* + 1. *Account Information screen*

1. Display

Ảnh có chứa văn bản, ảnh chụp màn hình, biểu đồ

Mô tả được tạo tự động

1. Description of objects on screen:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Name** | **Type** | **Constraint** | **Function** |
| first | butChangePass | Button |  | Change the password |
| 2 | listViewCN | ListView |  | Displays a list of functions the user is allowed to use |
| 3 | labelRole | Label |  | Displays the user's user group |
| 4 | labelName | Label |  | Displays the user's full name |
| 5 | botTable | TablePanel |  | Display user information |

1. List of events and corresponding handling on the screen:

|  |  |  |
| --- | --- | --- |
| **No** | **Incident** | **Handle** |
| first | When clicking on butChangePass | Display the password change screen |

* + 1. *Change password screen*

1. Display

Ảnh có chứa văn bản, ảnh chụp màn hình, Phông chữ, thiết kế

Mô tả được tạo tự động

1. Description of objects on screen:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Name** | **Type** | **Constraint** | **Function** |
| first | txtMKHT | Textbox |  | Enter current password |
| 2 | txtMKM | Textbox |  | Enter your new password |
| 3 | txtRMKM | Textbox |  | Confirm new password |
| 4 | butSave | Button |  | Save changes |

1. List of events and corresponding handling on the screen

|  |  |  |
| --- | --- | --- |
| **No** | **Incident** | **Handle** |
| first | When clicking butSave | Save user changes |
| 2 | When clicking on txtMKHT | The user enters the current password |
| 3 | When clicking on txtMKM | User enters new password |
| 4 | When clicking on txtRMKM | The user re-enters the new password |

* + 1. *Reader Management screen*

1. Display

Ảnh có chứa văn bản, ảnh chụp màn hình, số, phần mềm

Mô tả được tạo tự động

1. Description of objects on screen:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Name** | **Type** | **Constraint** | **Function** |
| first | butAdd | Button |  | More readers |
| 2 | butRefresh | Button |  | Refresh reader list |
| 3 | butFind | Button |  | Search for readers |
| 4 | DocGiaGrid | Datagrid |  | Display list of readers |
| 5 | txtFind | Textbox |  | Enter search information |
| 6 | butEdit | Button |  | Change reader information |

1. List of events and corresponding handling on the screen

|  |  |  |
| --- | --- | --- |
| **No** | **Incident** | **Handle** |
| first | When clicking on butAdd | Display the add readers screen |
| 2 | When clicking on butRefresh | Reload the reader list after manipulation |
| 3 | When clicking on butFind | Allows users to search by reader information |
| 4 | When clicking on txtFind | Enter the information readers are looking for |
| 5 | When clicking a line in DocGiaGrid | Displays the reader information screen corresponding to the selected line |
| 6 | When clicking on butEdit | Displays the reader card editing screen corresponding to the selected line |

* + 1. *Reader Type Management screen*

1. Display

Ảnh có chứa văn bản, ảnh chụp màn hình, phần mềm, Biểu tượng máy tính

Mô tả được tạo tự động

1. Describe objects on the screen

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Name** | **Type** | **Constraint** | **Function** |
| first | butAdd | Button |  | Add reader types |
| 2 | txtTenLoaiDG | Textbox |  | Enter the name of the new reader type |
| 3 | butRefresh | Button |  | Refresh reader type list |
| 4 | LoaiDocGiaGrid | Datagrid |  | Displays a list of reader types |

1. List of events and corresponding handling on the screen

|  |  |  |
| --- | --- | --- |
| **No** | **Incident** | **Handle** |
| first | When clicking on butAdd | Add reader type with name entered in txtLDG |
| 2 | When clicking txtTenLoaiDG | Enter the name of the new reader type |
| 3 | When clicking on butRefresh | Update reader type list after operation |

* + 1. *Reader Information screen*

1. Display

Ảnh có chứa văn bản, ảnh chụp màn hình, số, Phông chữ

Mô tả được tạo tự động

1. Description of objects on screen:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Name** | **Type** | **Constraint** | **Function** |
| first | butChange | Button |  | Change reader information |
| 2 | PhieuMuonGrid | Datagrid |  | Displays a list of readers' borrowed tickets |
| 3 | tableInfo | TablePanel |  | Display reader information |

1. List of events and corresponding handling on the screen

|  |  |  |
| --- | --- | --- |
| **No** | **Incident** | **Handle** |
| first | When clicking on butChange | Display the reader card editing screen |
| 2 | When clicking on a row in PhieuMuonGrid | Displays the ticket editing screen corresponding to the selected line |

* + 1. *Add Reader Card screen*

1. Display

Ảnh có chứa văn bản, ảnh chụp màn hình, phần mềm, Trang web

Mô tả được tạo tự động

1. Description of objects on screen:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Name** | **Type** | **Constraint** | **Function** |
| first | txtHoten | Textbox |  | Enter the reader's full name |
| 2 | dateNowSinh | Datetimepicker |  | Reader's date of birth |
| 3 | comboLoaiDG | Combo |  | List of reader types |
| 4 | txtDiaChi | Textbox |  | Enter the reader's address |
| 5 | txtEmail | Textbox |  | Enter reader email |
| 6 | txtUsername | Textbox |  | Enter the reader's username |
| 7 | txtUserpwd | Textbox |  | Enter the reader's password |
| 8 | txtChucVu | Textbox |  | Enter the reader's position |
| 9 | comboNND | Combo |  | Display user group list/ select user group |
| ten | dateNowLap | Datetimepicker |  | Select the date to create the reader card |
| 11 | dateNowHetHan | Label |  | Expiration date of the reader card |
| twelfth | butOK | Button |  | Add readers just entered |

1. List of events and corresponding handling on the screen

|  |  |  |
| --- | --- | --- |
| **No** | **Incident** | **Handle** |
| first | When clicking txtHoTen | The user enters the reader's full name |
| 2 | When clicking on dateNowSinh | The user chooses the reader's birthday |
| 3 | When clicking on comboLoaiDG | User selects reader type |
| 4 | When clicking on txtDiaChi | The user enters the reader's address |
| 5 | When clicking on txtEmail | User enters reader email |
| 6 | When clicking on txtUsername | The user enters the reader's username |
| 7 | When clicking on txtUserpwd | The user enters the reader's password |
| 8 | When clicking txtChucVu | The user enters the reader's position |
| 9 | When clicking on comboNND | User selects user group |
| ten | When clicking on dateNowLap | The user chooses the date of creation of the reader card |
| 11 | When clicking butOK | Save new reader information |

* + 1. *Reader card editing screen*

1. Display

Ảnh có chứa văn bản, ảnh chụp màn hình, Phông chữ, phần mềm

Mô tả được tạo tự động

1. Describe objects on the screen

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Name** | **Type** | **Constraint** | **Function** |
| first | txtHoten | Textbox |  | Reader's full name |
| 2 | dateNowSinh | Datetimepicker |  | Reader's date of birth |
| 3 | comboLoaiDG | Combo |  | List of reader types |
| 4 | txtDiaChi | Textbox |  | Reader address |
| 5 | txtEmail | Textbox |  | Email readers |
| 6 | labelNowLap | Label |  | Date of creation of reader card |
| 7 | labelHan | Label |  | Expiration date of the reader card |
| 8 | butOK | Button |  | Save reader information after editing |

1. List of events and corresponding handling on the screen

|  |  |  |
| --- | --- | --- |
| **No** | **Incident** | **Handle** |
| first | When clicking txtHoTen | Change reader's full name |
| 2 | When clicking on dateNowSinh | Change reader's date of birth |
| 3 | When clicking on comboLoaiDG | Change reader type |
| 4 | When clicking on txtDiaChi | Change reader address |
| 5 | When clicking on txtEmail | Change reader email |
| 6 | When clicking butOK | Save reader information after changes |