

University of Essex

**CE719 ICT Systems Integration and
Management**

**Assignment 2: LIBRARY BOOK
MANAGEMENT SYSTEM**

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PART A: ORGANIZE THE INTERVIEWS

Firstly, I want to interview the library staff because they have used the previous deployed system in the library and they know what functionalities it offers and what it lacks. Their user experience is going to help in defining the functions for the new Library Management System.

I want to ask following questions to the library staff:

1. Using Dynix, how do you tackle the situation if someone wants to loan the book for more than the specified time? Note: You can choose only one option while answering this question:
 - a. Mark the book as returned and then re-issue the book
 - b. Extend the loan

The above question is designed to gain information about the loan extension functionality. I.e. If the current Dynix software allows the loan extension or not. If the current system lacks this functionality, we are going to offer it in the new system. Otherwise, we are going to improve it while designing the new system.

2. What functions does current Dynix software allow you to perform? You can choose multiple options while answering this question:
 - a. Edit a book in the system
 - b. Add a book in the system
 - c. Delete a book from the system
 - d. Edit a member in the system
 - e. Add a new member
 - f. Delete the membership of a person
 - g. All of above options
 - h. None of the above options

The above question is designed to gain information about the functions that the library staff can perform on books and members using the current Dynix System. This is going to help in designing functions for books and members in the new library book management system that allows the library staff to perform all the possible tasks easily and conveniently.

3. What functionalities does current Dynix software offer you when you want to find a specific book, member or loan in the system? You can choose multiple options while answering this question:
 - a. Go through the list manually to find the desired book
 - b. Search bar available to find the desired book
 - c. Go through the list manually to find the desired member
 - d. Search bar available to find the desired member
 - e. Go through the list manually to find the desired loan
 - f. Search bar available to find the desired loan
 - g. None of the above options
 - h. All of the above options

The above question is designed to know how does the current system helps the library staff in locating a specific book, member or loan in the system. It is going to help in making the search functionality more fast in the new system.

Which of the following filters does current Dynix software offer in the search bar? You can choose multiple options while answering this question:

- a. Title filter to search a book
- b. Author filter to search a book
- c. Publisher filter to search a book
- d. Member ID filter to search a loan
- e. Book ID filter to search a loan
- f. All of the above options
- g. None of the above options

The above question is designed to know how much liberty and options does the current system gives to the library staff while searching for a book or a loan. It is going to help in making the book and loan search more convenient and efficient in the new system.

Secondly, I want to interview the Students as after the library staff, they are the most important users of this system and their feedback can help in defining the functions that our new Library Management System is going to offer them as users.

I want to ask following questions to them:

1. Do you have access to the Dynix System to gain information about books?
 - a. Yes
 - b. No

The above question is designed to know if the current Dynix system is only designed for the use of the library staff or the students can also use it.

2. If yes, which of the following functions can you perform using the system? You can choose multiple options while answering this question:
 - a. Be able to Search for a specific book using the search bar
 - b. Be able to see the list of all the books available in the system
 - c. Be able to see the current availability of a specific book in the library
 - d. Apply filters in the search bar
 - e. All of the above options
 - f. None of the above options

The above question has question one as a pre-requisite and it is designed to know what functionalities does the current Dynix system offer to the students. It's going to help in designing the functionalities for students as users for the new system.

3. If yes, what are the limitations of the Dynix System that you would want the New System to eliminate?

The above question is an open-ended question and it also has question one as a pre-requisite. It is designed to know what facilities does the current system lacks and can be added in the new system.

4. If No, what facilities would you like the new system to offer you?

The above question is also an open-ended question and like question 2 and 3 it has question 1 as a pre-requisite. It is designed to know what functionalities do students who have no past user experience of such system expect in a library system that is being designed for them.

Note: Question 3 and 4 are open ended questions but question 2 is asked on purpose before these questions so that the users can get a hint about the facilities that a book management system can offer and give their feedback accordingly in question 3 and 4.

PART B: SYSTEM ANALYSIS

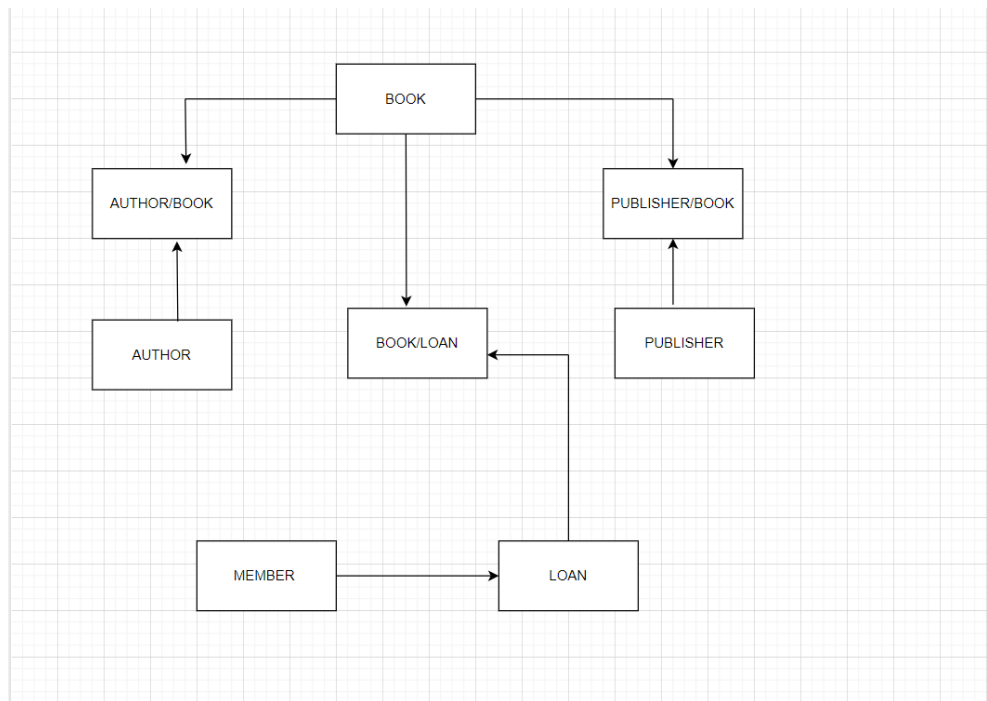


Figure 1: ER Diagram

BOOK MODULE:

Requirement	B1: LIST ALL THE BOOKS IN THE SYSTEM
Users	Library Staff (Admin), Users (Teachers, Students, etc.)
Functional Requirement	System allows the user to list down and view all the books present in the database. User shall click on the BOOKS option present on the homepage and system shall display all the books currently present in the database.
Non-Functional Requirement	<ul style="list-style-type: none"> Books page should be able to load in 4 seconds or less in the system. Separate platform for users and admin using a modular approach.

Description about the functional Requirement:

User Action		System Response	
1	User will click on the 'BOOKS' option on the homepage.	2	System will display a plus ICON on top right corner and a search bar on top left corner along with all books present in the database in ascending order with respect to their names.

Requirement	B2: ADD A BOOK TO THE SYSTEM
Users	Library Staff(Admin)
Functional Requirement	System allows the librarian to add a new book to the database by clicking on the plus ICON present on the top right corner of the books page. On clicking, System shall redirect the librarian to a new page that allows him/her to enter the credentials of the book and submit them.
Non-Functional Requirement	<ul style="list-style-type: none"> Books page should be able to load in 4 seconds or less in the system. Credentials page should be able to load in 2 seconds or less in the system. Error rate of the librarian submitting the details of the book should not exceed 5 percent (fit criteria). The pop-up message should disappear after 2 seconds. Database should be updated within 5 seconds or less. New book should be visible in the books list on the books page within 5 seconds or less.

Description about the functional Requirement:

User Action		System Response	
1	Librarian will click on the 'BOOKS' option on the homepage.	2	System will display a plus ICON on top right corner and a search bar on top left corner along with all books present in the database in ascending order with respect to their names.
3	Librarian clicks on the plus ICON present on the top right corner of the books page.	4	System redirects to a page containing multiple fields to be filled regarding the credentials of the book.

5	Librarian fills all the necessary fields. i. e. Name, Author, Publisher, etc. and clicks on the SUMBIT button.	6	System checks if the book is already present in the database. If so, it increments the number of copies of that specific book otherwise it adds the new book to the system assigning a unique Id to it. System displays the ADDED SUCCESSFULLY pop-up message and redirects to the books page.
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Requirement	B3: EDIT A BOOK IN THE SYSTEM		
Users	Library Staff(Admin)		
Functional Requirement	System allows the librarian to edit book details by clicking on any book from books list on the book page. On clicking the book, System shall display two options .i.e. Edit and Delete. On clicking the EDIT option, system redirects the librarian to a new page that allows him/her to edit the credentials of the book and update them.		
Non-Functional Requirement	<ul style="list-style-type: none"> Books page should be able to load in 4 seconds or less in the system. Details page should be able to load in 2 seconds or less in the system. Credentials page should be able to load in 2 seconds or less in the system. Error rate of the librarian submitting the updated details of the book should not exceed 5 percent (fit criteria). The pop-up message should disappear after 2 seconds. Database should be updated within 5 seconds or less. Updated details should be visible within 5 seconds or less. 		

Description about the functional Requirement:

User Action		System Response	
1	Librarian will click on the 'BOOKS' option on the homepage.	2	System will display a plus ICON on top right corner and a search bar on top left corner along with all books present in the database in ascending order with respect to their names.
3	Librarian clicks on the desired book from the list of the books.	4	System displays all the details of the respective book along with the. EDIT and DELETE options.
5	Librarian clicks on the EDIT option.	6	System redirects to a page containing different credentials of the respective book.
7	Librarian clicks on the field he/she wants to edit, enter updated details and click on the UPDATE button.	8	System performs necessary checks to see if the changes are valid and then update the details of the book accordingly in the database. System displays the UPDATED SUCCESSFULLY pop-up message.

Requirement	B4: DELETE A BOOK FROM THE SYSTEM		
Users	Library Staff(Admin)		
Functional Requirement	System allows the librarian to delete any book from the books page by clicking on it. On clicking the book, System shall display two options .i.e. EDIT and DELETE. On clicking the DELETE option, system asks for confirmation and deletes the desired book from the database.		
Non-Functional Requirement	<ul style="list-style-type: none"> Books page should be able to load in 4 seconds or less in the system. Details page should be able to load in 2 seconds or less in the system. Confirmation message should be displayed within less than one second after librarian clicks the DELETE option. The pop-up message should disappear after 2 seconds. Database should be updated within 5 seconds or less. 		

Description about the functional Requirement:

User Action		System Response	
1	Librarian will click on the 'BOOKS' option on the homepage.	2	System will display a plus ICON on top right corner and a search bar on top left corner along with all books present in the database in ascending order with respect to their names.
3	Librarian clicks on the desired book from the list of the books.	4	System displays all the details of the respective book along with the. EDIT and DELETE options.
5	Librarian clicks on the DELETE option	6	System asks for confirmation by displaying the message, "ARE YOU SURE YOU WANT TO DELETE THIS BOOK PERMANANENTLY?"
7a	Librarian clicks on the YES option.	8a	System deletes the book permanently from the database. System displays the DELETED SUCCESSFULLY pop-up message and redirects to the books page.
7b	Librarian clicks on the NO option.	8b	System redirects to the books page.

Requirement	B5: SEARCH A BOOK IN THE SYSTEM BY TITLE, AUTHOR OR PUBLISHER		
Users	Library Staff (Admin), Users (Teachers, students, etc.)		

Functional Requirement	System allows the user to search a book in the search bar present on top left corner of the books page. On clicking the search bar, user can type the desired search and also apply the desired filter (title, publisher, author) by clicking the filter icon in the search bar. By default, system applies the 'title' filter. User clicks ENTER and system displays all the matching books in the database.
Non-Functional Requirement	<ul style="list-style-type: none"> Books page should be able to load in 4 seconds or less in the system. Search results page should be able to load in 2 seconds or less in the system. Separate platform for users and admin using a modular approach.

Description about the functional Requirement:

User Action		System Response	
1	User will click on the 'BOOKS' option on the homepage.	2	System will display a plus ICON on top right corner and a search bar on top left corner along with all books present in the database in ascending order with respect to their names.
3	User clicks on search bar.	4	System opens the search bar displaying previous searches. System also displays the filter options on right corner of the search bar.
5a	User types the desired search and clicks ENTER.	6a	System applies the 'title' filter by default and displays all the matching books present in the database on the screen. If nothing matches the search, system displays the message, "Sorry! Not Found".
5b	User enters the desired search, chooses the desired filter and clicks ENTER.	6b	System applies the desired filter (author, publisher, title) of the user on the search and displays all books matching the search of the user. If nothing matches the search, system displays the message, "Sorry! Not Found".

MEMBER MODULE:

Requirement	M1: LIST ALL THE MEMBERS IN THE SYSTEM
Users	Library Staff (Admin)
Functional Requirement	System allows the librarian to list down and view all the members present in the database. He/she shall click on the MEMBERS option present on the homepage and system shall display all the members currently present in the database.
Non-Functional Requirement	<ul style="list-style-type: none"> 'MEMBERS' page should be able to load in 4 seconds or less in the system.

Description about the functional Requirement:

User Action		System Response	
1	Librarian will click on the 'MEMBERS' option on the homepage.	2	System will display a plus ICON on top right corner and a search bar on top left corner along with all members present in the database in ascending with respect to their names.

Requirement	M2: ADD A MEMBER TO THE SYSTEM
Users	Library Staff(Admin)
Functional Requirement	System allows the librarian to add a new member to the database by clicking on the plus ICON present on the top right corner of the MEMBERS page. On clicking, System shall redirect the librarian to a new page that allows him/her to enter the credentials of the new member and submit them.
Non-Functional Requirement	<ul style="list-style-type: none"> 'MEMBERS' page should be able to load in 4 seconds or less in the system. Credentials page should be able to load in 2 seconds or less in the system. Error rate of the librarian submitting the details of the member should not exceed 5 percent (fit criteria). The pop-up message should disappear after 2 seconds. Database should be updated within 5 seconds or less. New member should be visible on the member page in members list within 5 seconds or less.

Description about the functional Requirement:

User Action		System Response	
1	Librarian will click on the 'MEMBERS' option on the homepage.	2	System will display a plus ICON on top right corner and a search bar on top left corner along with all members present in the database in ascending order with respect to their names.
3	Librarian clicks on the plus ICON present on the top right corner of the MEMBERS page.	4	System redirects to a page containing multiple fields to be filled regarding the credentials of the new member.
5	Librarian fills all the necessary fields. i. e. Name, Email, Phone Number, etc. and clicks on the SUMBIT button.	6	System checks if the member is already present in the database. If so, it displays the message, "CAN'T CREATE DUPLICATE MEMBERSHIP" otherwise it adds the new member to the system assigning a unique Id to him/her. System displays the ADDED SUCCESSFULLY message and redirects to the MEMBERS page.

Requirement	M3: EDIT A MEMBER IN THE SYSTEM
Users	Library Staff(Admin)
Functional Requirement	System allows the librarian to edit member details by clicking on any member from membership list on the MEMBERS page. On clicking the member, System shall display two options .i.e. Edit and Delete. On clicking the EDIT option, system redirects the librarian to a new page that allows him/her to edit the credentials of the member and update them.
Non-Functional Requirement	<ul style="list-style-type: none"> • ‘MEMBERS’ page should be able to load in 4 seconds or less in the system. • Details page should be able to load in 2 seconds or less in the system. • Credentials page should be able to load in 2 seconds or less in the system. • Error rate of the librarian submitting the updated details of the member should not exceed 5 percent (fit criteria). • The pop-up message should disappear after 2 seconds. • Database should be updated within 5 seconds or less. • Updated details should be visible within 5 seconds or less.

Description about the functional Requirement:

User Action		System Response	
1	Librarian will click on the ‘MEMBERS’ option on the homepage.	2	System will display a plus ICON on top right corner and a search bar on top left corner along with all members present in the database in ascending order with respect to their names.
3	Librarian clicks on the desired member from the list of the members.	4	System displays all the details of the respective member along with the. EDIT and DELETE options.
5	Librarian clicks on the EDIT option.	6	System redirects to a page containing different credentials of the respective member.
7	Librarian clicks on the field he/she wants to edit, enter updated details and click on the UPDATE button.	8	System performs necessary checks to see if the changes are valid and then update the details of the member in the database. System displays the UPDATED SUCCESSFULLY message and redirects to the MEMBERS page.

Requirement	M4: DELETE A MEMBER FROM THE SYSTEM
Users	Library Staff(Admin)
Functional Requirement	System allows the librarian to delete any member from the MEMBERS page by clicking on it. On clicking the member, System shall display two options .i.e. EDIT and DELETE. On clicking the DELETE option, system asks for confirmation and deletes the desired member from the database.
Non-Functional Requirement	<ul style="list-style-type: none"> • ‘MEMBERS’ page should be able to load in 4 seconds or less in the system. • Details page should be able to load in 2 seconds or less in the system. • Confirmation message should be displayed within less than one second after librarian clicks the DELETE option. • The pop-up message should disappear after 2 seconds. • Database should be updated within 5 seconds or less.

Description about the functional Requirement:

User Action		System Response	
1	Librarian will click on the ‘MEMBERS’ option on the homepage.	2	System will display a plus ICON on top right corner and a search bar on top left corner along with all members present in the database in ascending order with respect to their names.
3	Librarian clicks on the desired member from the list of the members.	4	System displays all the details of the respective member along with the. EDIT and DELETE options.
5	Librarian clicks on the DELETE option	6	System asks for confirmation by displaying the message, “ARE YOU SURE YOU WANT TO DELETE THIS MEMBER PERMANANENTLY?”
7a	Librarian clicks on the YES option.	8a	System deletes the member permanently from the database. System displays the DELETED successfully message and redirects to the MEMBERS page.
7b	Librarian clicks on the NO option.	8b	System redirects to the MEMBERS page.

Requirement	M5: SEARCH MEMBERS IN THE SYSTEM BY NAME
Users	Library Staff (Admin)
Functional Requirement	System allows the librarian to search a member in the search bar present on top left corner of the MEMBERS page. On clicking the search bar, librarian will type the desired search and clicks ENTER. The system displays all the matching members present in the database.
Non-Functional Requirement	<ul style="list-style-type: none"> • ‘MEMBERS’ page should be able to load in 4 seconds or less in the system. • Search results page should be able to load in 2 seconds or less in the system.

Description about the functional Requirement:

User Action		System Response	
1	Librarian will click on the 'MEMBERS' option on the homepage.	2	System will display a plus ICON on top right corner and a search bar on top left corner along with all members present in the database in ascending order with respect to their names.
3	Librarian clicks on search bar.	4	System opens the search bar displaying previous searches.
5	Librarian types the desired name and clicks ENTER.	6	System displays all the members matching the entered search on the screen from the database. If nothing matches the search, system displays the message, "Sorry! Not Found".

LOAN MODULE:

Requirement	L1: LIST ALL THE LOANS IN THE SYSTEM
Users	Library Staff (Admin)
Functional Requirement	System allows the librarian to list down and view all the loans present in the database. Librarian shall click on the LOANS option present on the homepage and system shall display all the loans currently present in the database.
Non-Functional Requirement	<ul style="list-style-type: none"> LOANS page should be able to load in 4 seconds or less in the system.

Description about the functional Requirement:

User Action		System Response	
1	Librarian will click on the 'LOANS' option on the homepage.	2	System will display a CHECK-OUT ICON on top right corner and a search bar on top left corner along with all loans present in the database.

Requirement	L2: CHECK OUT A BOOK
Users	Library Staff(Admin)
Functional Requirement	System allows the librarian to check out a book by clicking on the CHECK-OUT ICON present on the top right corner of the LOANS page. On clicking, System shall redirect the librarian to a new page that allows him/her to enter the book and member credentials and perform the check out.
Non-Functional Requirement	<ul style="list-style-type: none"> LOANS page should be able to load in 4 seconds or less in the system. Credentials page should be able to load in 2 seconds or less in the system. Error rate of the librarian submitting the details of the book and member should not exceed 2 percent (fit criteria). The pop-up message should disappear after 2 seconds. Database should be updated within 5 seconds or less. New loan should be visible on the books page within 5 seconds or less.

Description about the functional Requirement:

User Action		System Response	
1	Librarian will click on the 'LOANS' option on the homepage.	2	System will display a CHECK-OUT ICON on top right corner and a search bar on top left corner along with all loans present in the database.
3	Librarian clicks on the CHECK-OUT ICON present on the top right corner of the loans page.	4	System redirects to a page containing multiple fields to be filled regarding the credentials of the book to be checked out and the user loaning the book.
5	Librarian fills all the necessary fields. i. e. Book ID, Membership ID of the person loaning the book, etc. and clicks on the CHECK OUT button.	6	System checks if the book is available and if the user can loan the book. If so, it decrements the number of copies available of that specific book, add a new loan to the database against a unique id and displays the message CHECK OUT SUCCESSFUL and redirects to the loan page. Otherwise system displays the CHECK OUT NOT SUCCESSFUL message and redirects to the loan page.

Requirement	L3: EXTEND A LOAN FOR A BOOK
Users	Library Staff (Admin)
Functional Requirement	System allows the librarian to extend the loan for a book. Librarian shall click on the desired loan from the list of the Loans present on the LOANS page. He/she will then choose the extend option for that loan and specify the extension days.
Non-Functional Requirement	<ul style="list-style-type: none"> 'LOANS' page should be able to load in 4 seconds or less in the system. Details page should be able to load in 2 seconds or less in the system. Text Bar to enter days should be displayed within less than one second after librarian clicks the EXTEND option. The pop-up message should disappear after 2 seconds.

	<ul style="list-style-type: none"> Database should be updated within 5 seconds or less.
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Description about the functional Requirement:

User Action		System Response	
1	Librarian will click on the 'LOANS' option on the homepage.	2	System will display a CHECK-OUT ICON on top right corner and a search bar on top left corner along with all loans present in the database.
3	Librarian will click on the specific loan that he/she desires to extend.	4	System shall display a page containing the details of the loan along with the EXTEND and RETURNED options.
5	Librarian shall click on the EXTEND option.	6	System shall ask to enter the desired extension days.
7	Librarian shall enter the number of days.		System shall update the loan details in the database and display the LOAN EXTENDED SUCCESSFULLY message and redirects to the loans page.

Requirement	L4: SEARCH FOR A LOAN IN THE SYSTEM BY MEMBER ID OR BOOK ID
Users	Library Staff (Admin)
Functional Requirement	System allows the librarian to search a loan in the search bar present on top left corner of the LOANS page. On clicking the search bar, librarian will type the id and clicks ENTER. The system displays all the loans present against the entered id. System also allows the librarian to apply a filter (member or book) in the search bar.
Non-Functional Requirement	<ul style="list-style-type: none"> 'LOANS' page should be able to load in 4 seconds or less in the system. Search results page should be able to load in 2 seconds or less in the system.

Description about the functional Requirement:

User Action		System Response	
1	Librarian will click on the 'LOANS' option on the homepage.	2	System will display a CHECK-OUT ICON on top right corner and a search bar on top left corner along with all loans present in the database.
3	Librarian clicks on search bar.	4	System opens the search bar displaying previous searches. System also displays the filter options on right corner of the search bar.
5a	Librarian types the desired search and clicks ENTER.	6a	System applies the 'BOOK ID' filter by default and displays all loans present against the book in the database. If nothing matches the search, system displays the message, "Sorry! Not Found".
5b	Librarian enters the desired search, chooses the desired filter and clicks ENTER.	6b	System applies the desired filter (BOOK ID, MEMBER ID) and displays all loans present against the searched ID in the database. If nothing matches the search, system displays the message, "Sorry! Not Found".

Requirement	L5: MARK LOAN AS RETURNED
Users	Library Staff (Admin)
Functional Requirement	System allows the librarian to mark a specific loan as returned. Librarian shall click on the desired loan from the list of the Loans present on the LOANS page. He/she will then choose the RETURNED option for that loan and system shall delete that loan from the database.
Non-Functional Requirement	<ul style="list-style-type: none"> 'LOANS' page should be able to load in 4 seconds or less in the system. Details page should be able to load in 2 seconds or less in the system. Confirmation message should be displayed within less than one second after librarian clicks the RETURNED option. The pop-up message should disappear after 2 seconds. Database should be updated within 5 seconds or less.

Description about the functional Requirement:

User Action		System Response	
1	Librarian will click on the 'LOANS' option on the homepage.	2	System will display a CHECK-OUT ICON on top right corner and a search bar on top left corner along with all loans present in the database.
3	Librarian will click on the specific loan that he/she desires to mark as returned.	4	System shall display a page containing the details of the loan along with the EXTEND and RETURNED options.
5	Librarian shall click on the RETURNED option.	6	System shall ask to confirm by choosing YES or NO option.
7	Librarian shall confirm by choosing the YES option.	8	System shall delete that loan from the database, displays the message RETURNED SUCCESSFULLY and redirects to the loans page.

PART C: SYSTEM DESIGN

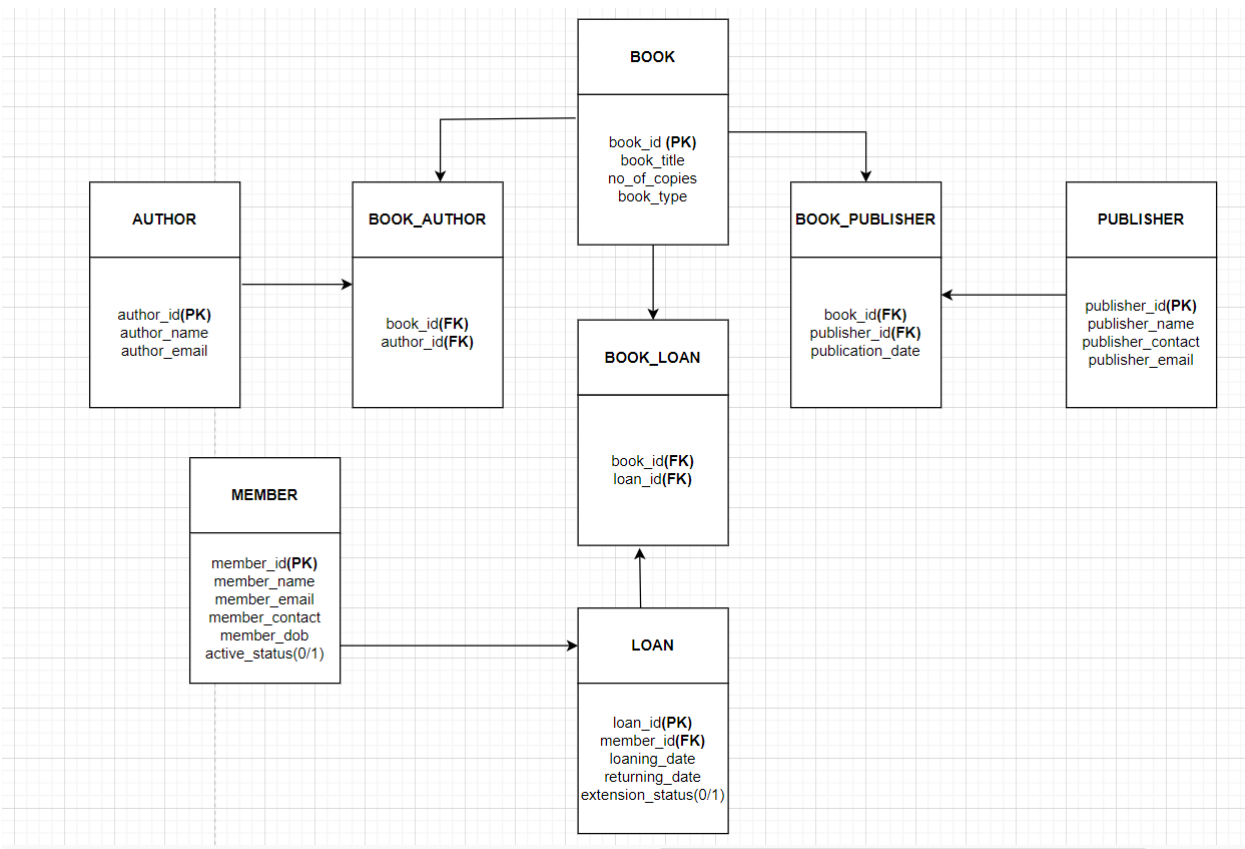


Figure 2: Database Design

1. **Book Table:** `book_id(Primary Key)`, `book_title`, `no_of_copies`, `book_type`
2. **Publisher Table:** `publisher_id(Primary Key)`, `Publisher_name`, `publisher_contact`, `publisher_email`
3. **Book_Publisher Table:** `book_id(Foreign key-from Book table)`, `publisher_id (Foreign Key-from Publisher table)`, `publication_date`

Note: As one book can have multiple publishers and likewise one publisher can publish multiple books, therefore, I have added `book_publisher` table in the database.

4. **Author Table:** `author_id(Primary Key)`, `author_name`, `author_email`
5. **Book_Author Table:** `book_id(Foreign key-from Book table)`, `author_id (Foreign Key-from Author table)`

Note: As one book can have multiple authors and likewise one author can write multiple books, therefore, I have added `book_author` table in the database.

6. **Member Table:** `member_id(Primary Key)`, `member_name`, `member_email`, `member_contact`, `member_dob`, `active_status`
7. **Loan Table:** `loan_id(Primary Key)`, `member_id(Foreign Key-From Member Table)`, `loaning date`, `returning_date`, `extension_status`

8. **Book_Loan Table:** `book_id(Foreign Key-from Book table)`, `loan_id(Foreign Key-from Loan table)`

Note: As one book can be loaned multiple times and likewise one loan can contain multiple books, therefore, I have added `book_loan` table in the database.

PART D: PROJECT MANAGEMENT

Tasks	SD1	SD2	SD3
Design book module	4	6.67=7	16
Design author module	1	1.67=2	4
Design publisher module	2	3.33=4	8
Design member module	2	3.33=4	8
Design loan module	4	6.67=7	16
	P1	P2	P3
Program book module	7.5=8	6	20
Program author module	1.25=2	1	3.33=4
Program publisher module	3.75=4	3	10
Program member module	3.75=4	3	10
Program loan module	7.5=8	6	20
	TA1	TA2	TA3
Document book module	5	6	3.75=4
Document author module	1.67=2	2	1.25=2
Document publisher module	3.33=4	4	2.5=3
Document member module	3.33=4	4	2.5=3
Document loan module	5	6	3.75=4

Figure 3: Elapsed Times for team members on related tasks

Note: I have rounded off the decimal points to a full day using the upper ceiling technique.

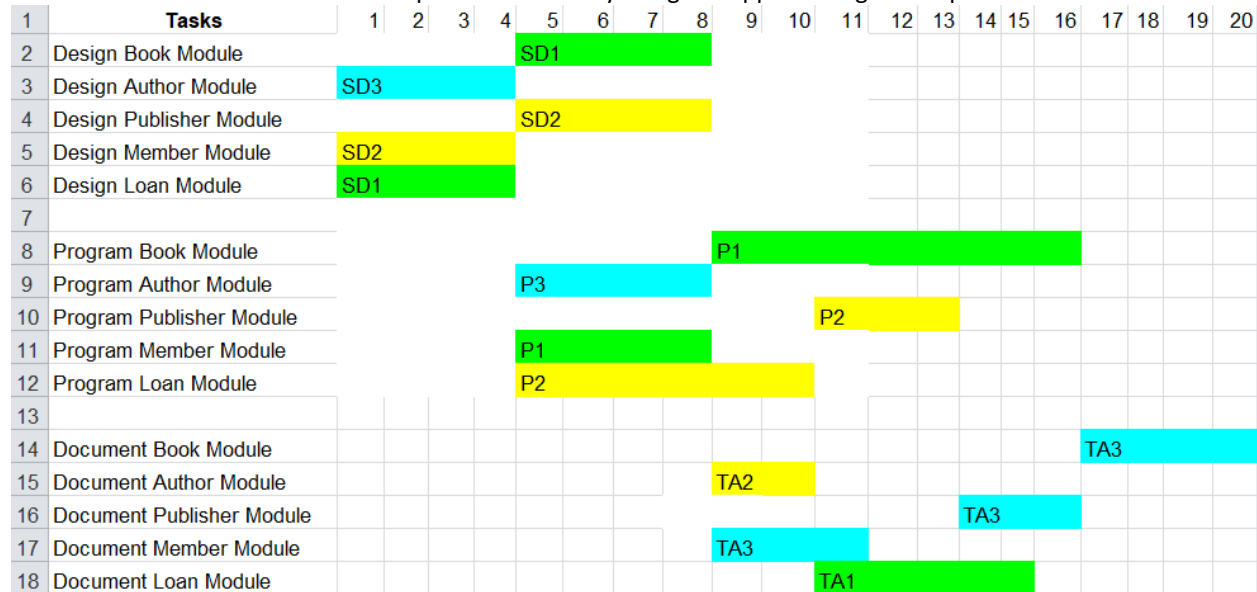


Figure 4: Task Assigning to Team Members

Note: The numbers shows the number of days in the above giant chart and it can be seen that tasks can be assigned such that the whole project will be completed within 20 days.

Programming and Documentation of a specific module can be started once the designing of that module is completed.