BENGAL COLLEGE OF ENGINEERING AND TECHNOLOGY

Department of Computer Science and Engineering

(NBA Accredited)

FINAL YEAR MAJOR PROJECT

(July-Dec 2024)

Progress Report

This report, in the form of a template, has been specifically designed for B.Tech. (CSE) students working on their Final Year Major Project (FYP) at Computer Science & Engineering Department, BCET, Durgapur.

Every group of students is required to do the following:

1. Complete all the sections of this template
2. Get it certified by the assigned internal advisor before the day of evaluation.
3. Submit 1(One) photocopy to each of the following, on or before the day of evaluation:
    a. Internal advisor
    b. Co-internal advisor (if any)
4. Submit original copy to FYP coordinator on the day of evaluation
5. Email PDF/MS Word document to technical advisors and FYP coordinator.

Note:

1. Use UK English
2. There should be NO grammatical or spelling mistakes
3. Submission after due date will not be accepted
4. For more information, contact your internal advisor and/or FYP coordinator

- Read the above carefully and attach this page at the end of your report before submission -

1. Project identification

<table>
<tr><td>1.1 Project title</td><td>ONLINE LIBRARY MANAGEMENT SYSTEM</td></tr>
<tr><td>1.2 Group No.</td><td>50</td></tr>
<tr><td>1.3 Group members
(List names along with university roll no. and roles defined for project)</td><td>
Member Name and Roll No. Role
<table>
<tr><td>1.</td><td>DIVYANSHU KUMAR, 12500121118</td><td>DEVLOPED FRONTEND & BACKEND</td></tr>
<tr><td>2.</td><td>SHIVAM KUMAR JHA, 12500121123</td><td>DATABASE BINDING</td></tr>
<tr><td>3.</td><td>RAHBAR RAZVI KHAN, 12500121135</td><td>RESEARCH & PAPER WORK</td></tr>
<tr><td>4.</td><td></td><td></td></tr>
</table>
</td></tr>
<tr><td>1.4 Technical advisor(s)
(As officially assigned)</td><td>
1.4.1 Internal Supervisor:
Name: Dr. Pramod Pal
Designation: Professor
1.4.2 Co-internal Supervisor (if any):
Name: _____
Designation: _____
1.4.3 External Supervisors (if any):
1. Name: _____
Designation: _____
Company/Institute: _____
</td></tr>
</table>

1.5 CERTIFICATE

"This is to certify that the final year project work evaluation held on **19/11/2024_**

Titled ONLINE LIBRARY MANAGEMENT SYSTEM__, executed (as till date) by the students'

1. DIVYANSHU KUMAR (12500121118)

2. SHIVAM KUMAR JHA (12500121123)

3. RAHBAR RAZVI KHAN (12500121135) has been found satisfactory and every section of this report is reflecting the same."

Project Coordinator	Project Convenor	Project Guide	HOD, CSE

2. Project insights

2.1 Thematic area(s)	☐ Research ☐ S/W Development ☐ Industry Automation ☐ Institute Automation ☐ Other *(please specify)*: **Sub-areas** *(optional)*: ☐ Mobile Programming ☐ Web Programming ☐ Data Mining ☐ Networking ☐ Image Processing ☐ Artificial Intelligence ☐ Machine Learning ☐ Data Mining ☐ Deep Learning ☐ Data Science and Big Data ☐ Cyber security ☐ Block chain and Crypto currencies ☐ Internet of Things (IoT) ☐ Cloud Computing ☐ Quantum Computing ☐ Human-Computer Interaction (HCI) ☐ Augmented Intelligence ☐ Others *(please specify)*:
2.2 Utilization scope	☐ Domestic ☐ Commercial ☐ Industrial ☐ Scientific ☐ Global ☐ National ☐ State ☐ District ☐ GNDEC ☐ University ☐ External ☐ Sponsor ☐ College ☐ Other *(please specify)*:
2.3 Major task(s) *(At least one should be checked)*	☐ Modeling ☐ S/W Designing ☐ Fabrication ☐ Testing ☐ Validation ☐ Optimization ☐ Consultancy document ☐ Physical tool(s) development ☐ Software development ☐ Research & Development ☐ Artificial Intelligence ☐ Machine Learning ☐ Data Mining ☐ Deep Learning ☐ Data Science and Big Data ☐ Cyber security ☐ Block chain and Crypto currencies ☐ Internet of Things (IoT) ☐ Cloud Computing ☐ Quantum Computing ☐ Human-Computer Interaction (HCI) ☐ Augmented Intelligence ☐ Others *(please specify)*:
2.4 Software packages, tools and programming languages *(Software piracy is strictly prohibited.)*	☐ MS Excel ☐ VBA ☐ C/C++/C# ☐ FORTRAN ☐ MATLAB ☐ Maple ☐ Mathematica ☐ EES ☐ AutoCAD ☐ Pro-E ☐ CATIA ☐ Adams ☐ ANSYS ☐ Fluent ☐ CFX ☐ SPICE ☐ TRNSYS ☐ HAP ☐ WindFarmer ☐ RETScreen ☐ MiniTab ☐ SPSS ☐ SAS ☐ R / S ☐ VB ☐ Java ☐ PHP ☐ ASP/.NET ☐ Oracle ☐ SAP ☐ MySQL ☐ SQL ☐ Python ☐ Mongo ☐ MariaDB ☐ Anaconda

	☐ Java Full Stack ☐ .net full stack ☐ Visual Studio ☐ Android studio*(please specify)*: ☐ Others *(please specify)*:

3. Relevant study material

3.1 Books and other printed material *(Must be easily accessible. Add more rows if required.)*	**Reference #** *(if any)*	**Title, edition, publishing year and authors' names**
	1.	
	2.	
	3.	
	4.	
	5.	
	6.	

3.2 Standards and databases *(Must be easily accessible. Add more rows if required.)*	**Name, purpose, source and other details** 1. MS SQL , EASY TO MANAGE DATA 2. 3. 4.
3.3 Online / web resources *(Must be easily accessible. Search engines, social blogs, and unauthentic resources should not be mentioned. Any reliable URL shortening service may be used. Add more rows if required.)*	**URL of specific web page** 1. 2. 3. 4.

4. Objective / Scope

Write the objective/scope that has been understood from project title and meetings. Title and scope of project must be elaborated in detail. Maximum 500 words.

TITLE :- ONLINE LIBRARY MANAGEMENT SYSTEM

Scope of the Project:

The **Online Library Management System** is a robust and user-friendly platform designed to streamline library operations and enhance the user experience. This system caters to two primary user groups: **administrators** and **members**. The objective of this project is to digitize the traditional library management process, ensuring efficiency, transparency, and accessibility. The system provides functionalities for managing books, authors, publishers, members, and book transactions in a centralized, automated, and visually appealing environment.

Detailed Scope:

1. **User Management:**
   - **Member Registration:** New users can sign up and register as members. The system maintains their account details, offering a seamless and personalized experience.
   - **Account Status Management:** Admins have the capability to update a member's account status to "Active," "Pending," or "Defaulter." This ensures proper monitoring and control of member activities.
   - **Permanent Deletion:** Admins can delete a user permanently, effectively removing their records from the system.
2. **Author Management:**
   - Admins can efficiently manage authors, including the ability to add new authors, update existing records, and delete unnecessary entries.
   - A **search functionality** by ID helps admins quickly locate specific authors.
   - A comprehensive list of all authors is available for easy reference and decision-making.
3. **Publisher Management:**
   - Similar to author management, the admin can add, update, and delete publisher records.
   - Searching publishers by ID enables quick access to specific publisher details.
   - The system provides an up-to-date list of all publishers, making it easy to view and manage them.
4. **Book Inventory Management:**
   - Admins can add books with detailed metadata, including title, author, publisher, genre, ISBN, and more.
   - A visually appealing grid view displays book details, including their cover images, offering an engaging user interface.
   - Comprehensive inventory management ensures accurate record-keeping of available books in the library.
5. **Book Issuing and Return Management:**
   - Admins can issue books to registered members and maintain detailed records of each transaction.

    - The system allows easy tracking of issued books, due dates, and returns. This functionality ensures that overdue or returned books are managed efficiently.
6. **Member Interaction with Books:**
    - Members can browse through the library's collection to view the available books, facilitating ease of access and exploration.
7. **Professional Design and Usability:**
    - The project includes a modern, user-friendly design, ensuring that both administrators and members can navigate the system effortlessly.
    - Book details include images, enhancing the aesthetic appeal and functionality of the system.

Objective of the Project:

The primary objective of the **Online Library Management System** is to provide a centralized and automated platform for managing library operations. The system aims to:

1. Minimize manual tasks, reducing the chances of human error and inefficiency.
2. Offer administrators the tools to manage books, authors, publishers, and members seamlessly.
3. Provide members with easy access to the library's book collection, enhancing their user experience.
4. Ensure data accuracy and accessibility for better decision-making and improved library management.
5. Create a visually appealing and intuitive interface that makes library management enjoyable and straightforward.

This system is an all-in-one solution designed to revolutionize traditional library practices, offering a sophisticated and scalable platform for library management.

5. Expected outputs

List expected outputs of the project in discrete terms. Maximum 250 words.

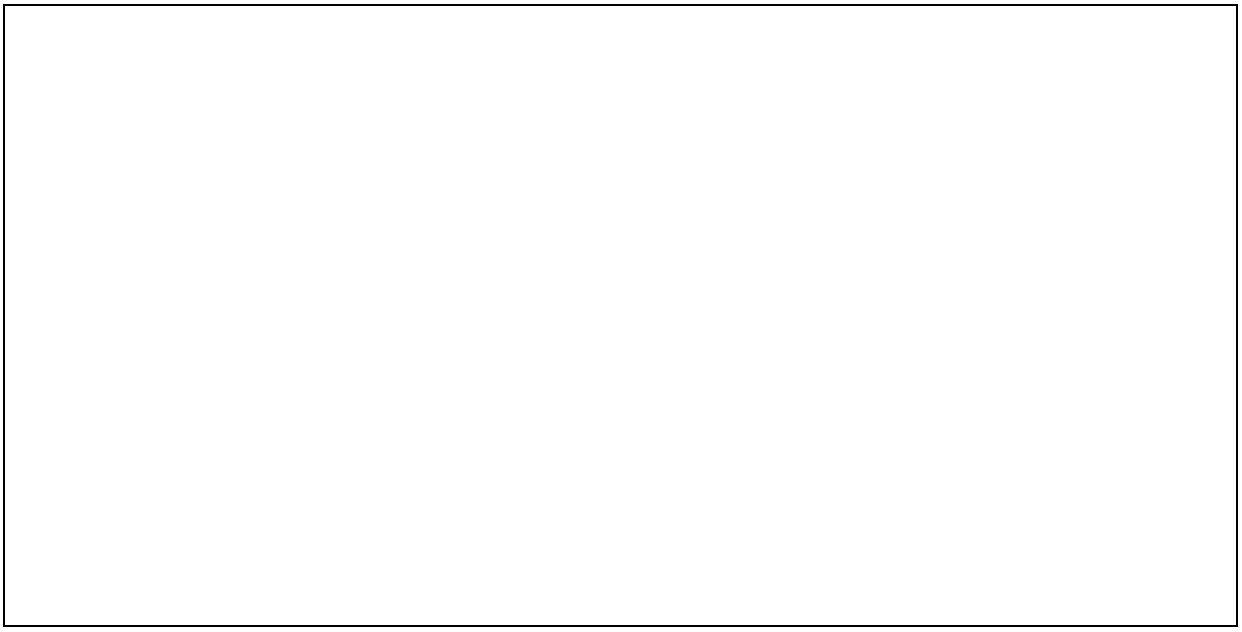
1. **User Registration and Management:**
    - Successful registration of new members with secure login credentials.
    - Updated member status (Active, Pending, Defaulter) visible to the admin.
    - Permanent deletion of user records by the admin.
2. **Author Management:**
    - Ability to add, update, and delete author records.
    - Search results for authors based on ID.
    - A complete list of all authors for reference.
3. **Publisher Management:**
    - Functionality to add, update, and delete publishers.
    - Search results for publishers based on ID.
    - A comprehensive list of all publishers for management purposes.
4. **Book Inventory:**
    - Addition of books with complete details and cover images.
    - Accurate tracking of available books in a visually appealing grid view.
5. **Book Issuing and Returns:**
    - Record of issued books with member details.
    - Real-time tracking of due and returned books for efficient management.
6. **Member Interaction:**
    - Members can view the library's book collection with detailed information.
7. **Data Management:**
    - Secure and centralized storage of library data for authors, publishers, books, members, and transactions.
8. **Professional Design:**
    - Intuitive user interface with modern design elements, including book images and structured layouts for all modules.

The system delivers efficient library management, user satisfaction, and operational excellence.

6. Utilization

Describe target beneficiaries, target market, potential customers, etc. Maximum 250 words.

1. **Target Beneficiaries:**
    - **Library Administrators:** The system simplifies day-to-day library operations like book management, author and publisher tracking, member management, and book transactions. Administrators benefit from reduced manual work, streamlined processes, and accurate records.
    - **Library Members:** Registered users gain easy access to the library's catalog, enabling them to explore books and interact with the library efficiently. Members benefit from a seamless experience in viewing available books and borrowing them.
    - **Educational Institutions:** Schools, colleges, and universities can adopt this system to manage their libraries, enhancing operational efficiency and ensuring better service for students and faculty.
2. **Target Market:**
    - **Public Libraries:** Municipal or community libraries can use this system to serve a large audience effectively.
    - **Private Libraries:** Corporate and organizational libraries can manage their book inventories and membership with ease.
    - **Academic Institutions:** Schools, colleges, and universities looking for a comprehensive library management solution.
    - **Digital and Hybrid Libraries:** Libraries that operate both physically and digitally can integrate the system for unified management.
3. **Potential Customers:**
    - **Library Management Teams:** Teams seeking an automated system to replace manual processes.
    - **Educational Institutes:** Schools and universities with large libraries.
    - **Corporate Organizations:** Organizations with internal libraries for employees.
    - **Library Service Providers:** Companies offering library setups or solutions to institutions.



7. Literature study / Data collection

Describe the topics and type of literature studied or collected for study, to define the project path and methodology. Citations are recommended. Maximum 500 words.

To effectively design and implement the **Online Library Management System**, a wide range of literature and resources were studied, focusing on library management, system design principles, user experience, and relevant technologies. These studies provided a clear understanding of the challenges, requirements, and solutions for library automation. Below is a detailed breakdown of the topics and types of literature explored:

1. Library Management Systems (LMS):

- **Traditional Library Systems:** Research on manual library operations, including book cataloging, borrowing, and return processes, highlighted inefficiencies like delays, human errors, and data management challenges.
- **Modern LMS:** Studies of existing digital library management systems, such as Koha and Evergreen, helped identify best practices for features like book inventory tracking, user account management, and automated alerts.
- **Case Studies:** Real-world implementations of LMS in academic and public libraries provided insights into common issues like system scalability, usability, and integration with existing workflows.

2. System Design and Development:

- **Database Management:** Literature on relational databases and normalization techniques informed the design of the project's database schema, ensuring optimized storage of books, authors, publishers, members, and transactions.
- **User Interface (UI) and User Experience (UX):** Articles and guidelines on intuitive UI/UX design, including Jakob Nielsen's usability heuristics, emphasized creating a user-friendly interface for both admins and members.
- **Web Development Frameworks:** Documentation on ASP.NET, Entity Framework, and MVC architecture shaped the project's technological foundation.

3. User Management and Security:

- **Authentication and Authorization:** Research on secure user authentication

mechanisms, such as password hashing and role-based access control (RBAC), ensured the system's security for members and administrators.

- **Data Privacy:** General guidelines from sources like the General Data Protection Regulation (GDPR) emphasized safeguarding user data, especially sensitive details like account credentials.

4. Automation and Efficiency:

- **Library Automation Literature:** Studies on automating tasks like book issuance, return tracking, and overdue alerts informed the system's automation logic.
- **Efficiency Metrics:** Research papers on reducing library management overheads highlighted the importance of streamlined workflows and minimizing manual interventions.

5.Technology and Tools:

- **Programming Languages and Frameworks:** Tutorials and documentation on C#, ASP.NET MVC, and Bootstrap were used to implement backend logic and create a professional design.
- **Relational Databases:** Resources on SQL Server provided guidance on efficient querying and database operations.
- **Grid Views and Visualization:** Best practices for displaying book inventories in grid views with images were derived from UI/UX-focused literature.

8. Methodology

Concisely list down the principle milestones and associated deliverables that must be achieved to accomplish the project objectives. Add more rows if required.

S. No.	List of project milestones	Deliverable(s)	Expected number of days to complete	Percent Completed
1.	Project Planning and Requirements Gathering	Detailed Project Plan	4	100
2.	System Design and Architecture Development	High-level architecture diagram for the system.	3	100
3.	Core Module Development	Functional user registration and login system.	7	100
4.	Transaction Module Development	Working module for issuing and returning books.	5	100
5.	Testing and Quality Assurance	Bug tracking and resolution report.	3	100

9. Executed work

Describe in detail the works along with the obtained results and deliverables that have been completed until now and how. Note that very general information about topics is NOT required so try to be specific. The sequence, as already described in Methodology (Sec. 8), should be followed as possible. Maximum 3 pages including equations, figures and tables etc.

Project Initialization and Requirements Gathering

- **Work Done:**
  The project's scope and objectives were thoroughly analyzed. Functional requirements such as user registration, author management, publisher management, book inventory, member status updates, and book issuing/returning processes were documented. Non-functional requirements, including system security, usability, and scalability, were also outlined. The project timeline and milestones were defined with clear deliverables.
- **Results and Deliverables:**
  - Requirements Specification Document outlining functional (e.g., adding books, issuing books) and non-functional requirements (e.g., system response time < 2 seconds).
  - Initial project timeline and Gantt chart for milestone tracking.

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2. System Design and Architecture Development

- **Work Done:**
  The system architecture was designed using the **Model-View-Controller (MVC)** pattern for better modularity. The database schema was designed with normalized tables for entities like Authors, Publishers, Books, Members, and Transactions. Wireframes were created to define the user interface for admin and member functionalities.
- **Results and Deliverables:**
  - **Database Schema:** Includes key tables such as:
    - **Authors:** `AuthorID (PK)`, `Name`, `Bio`, `Country`.
    - **Publishers:** `PublisherID (PK)`, `Name`, `Contact`, `Address`.
    - **Books:** `BookID (PK)`, `Title`, `AuthorID (FK)`, `PublisherID (FK)`,

Category, CoverImagePath, Stock.

- **Members:** MemberID (PK), Name, Status, Email.
- **Transactions:** TransactionID (PK), BookID (FK), MemberID (FK), IssueDate, ReturnDate, Status.

- Wireframes: Admin dashboard, member registration page, and book inventory grid view.

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3. Core Module Development

- **Work Done:**
  Development focused on the user management module (registration and login), author management, and publisher management functionalities. Features were implemented for CRUD (Create, Read, Update, Delete) operations and searching by ID for authors and publishers.
- **Results and Deliverables:**
  - **User Management Module:**
    - Registration with form validation.
    - Secure login using hashed passwords and role-based access control (Admin/Member).
  - **Author Management Module:**
    - Add, update, delete, and search authors by ID.
    - List view displaying all authors.
  - **Publisher Management Module:**
    - Add, update, delete, and search publishers by ID.
    - List view displaying all publishers.

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4. Book Inventory Management

- **Work Done:**
  The book inventory module was developed with functionality to add books, including details like title, author, publisher, category, and cover image. Books are displayed in a grid view with images and metadata for better visualization.

- **Results and Deliverables:**
    - **Book Management Module:**
        - Adding new books with author and publisher relationships.
        - Grid view with sorting and filtering options for book inventory.
        - Cover image upload functionality with validation for file size and type.

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5. Member Management

- **Work Done:**
  Functionality for admins to update member account statuses (Active, Pending, Defaulter) and delete user accounts permanently was implemented. A dashboard displaying member details was created for easy management.
- **Results and Deliverables:**
    - **Member Management Module:**
        - Account status modification.
        - Member deletion with confirmation prompts.
        - Member list with searchable filters (name, status).

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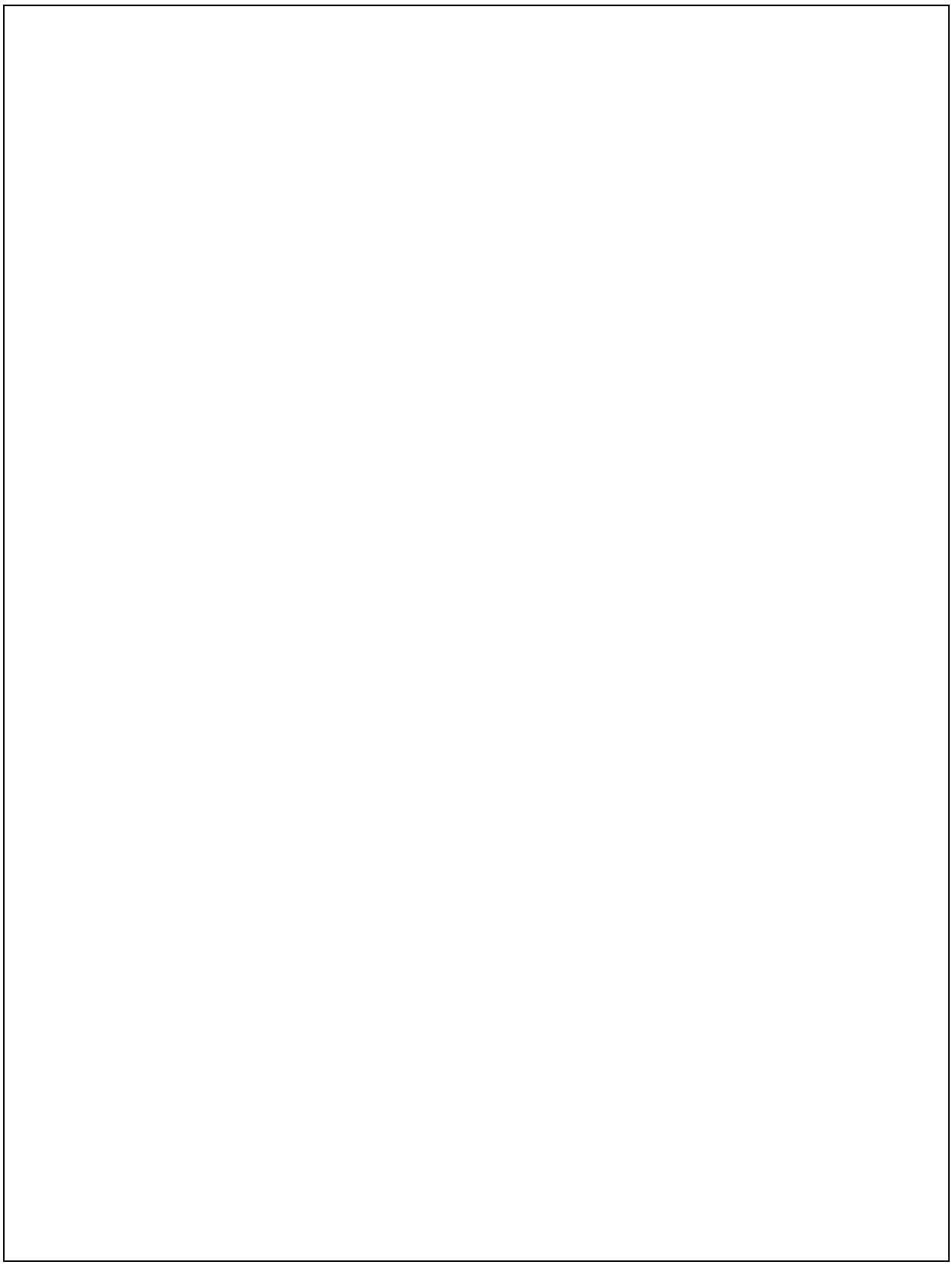
6. Book Issuing and Returns

- **Work Done:**
  The book issuing and returning module was created, allowing admins to track transactions. Automatic due date assignment and status updates (e.g., issued, returned) were implemented.
- **Results and Deliverables:**
    - **Issuing Module:**
        - Admin selects a member and book, with auto-assigned issue and return dates.
    - **Return Module:**
        - Updates the transaction record and adjusts book stock levels.



10. Remaining work

Describe in detail the plans to execute remaining works. The sequence, as already described in Methodology (Sec. 8), should be followed as possible. Maximum 500 words.

NA

11. Conclusions

(Strong closing statements. Maximum 500 words)

The **Online Library Management System** has been designed and developed as a robust, efficient, and user-friendly platform to streamline library operations. From its inception, the project has focused on addressing key challenges faced by libraries, such as managing a large inventory of books, maintaining user accounts, and tracking book transactions. Through meticulous planning, systematic implementation, and adherence to best practices in software development, the project has achieved significant milestones and is poised to deliver an impactful solution.

The system's features, including user registration, author and publisher management, book inventory management, member account management, and book issuing/return functionalities, have been developed with a focus on usability and performance. By leveraging a structured architecture, the platform ensures maintainability and scalability, enabling future enhancements as library needs evolve. The inclusion of intuitive dashboards, grid views with filtering capabilities, and role-based access control ensures that both administrators and members can interact with the system seamlessly.

Throughout the development process, the project has remained committed to achieving its objectives. The implementation of secure login mechanisms, streamlined CRUD operations for key modules, and dynamic status updates for member accounts demonstrates the attention to detail and alignment with user needs. As the project moves toward completion, efforts will focus on comprehensive testing and quality assurance to ensure the system functions reliably under various scenarios. The final deployment phase will include thorough user training and documentation to empower both library staff and members to make the most of the system's features.

In conclusion, the **Online Library Management System** represents a significant step forward in modernizing library management processes. It simplifies administrative tasks, enhances user engagement, and promotes efficient resource utilization. This project is not merely a software solution; it is a comprehensive tool designed to transform how libraries operate, fostering a culture of knowledge-sharing and accessibility. The successful realization of this system is a testament to the power of careful planning, thoughtful execution, and a relentless commitment to excellence.

12. References

Style "IEEE - Reference Order" should be followed for giving references of books, research papers, reviews, online resources, databases, software manuals, figures and anything else cited in this report.

Evaluation by Technical Advisor(s) and Sponsor(s)

Please ✓ if work is satisfactory or ✕ if work is not satisfactory and therefore requires a revision.

Section	Internal advisor	Remarks by Internal Advisor	Remarks by Project Coordinator(s)
1. Project identification			
2. Project insights			
3. Relevant study material			
4. Objective/Scope			
5. Expected outputs			
6. Utilization			
7. Literature study/Data collection			
8. Methodology			
9. Executed work			
10. Remaining work			
11. References			
Overall performance			
Signature and date			