Shanto-Mariam University of Creative Technology

Department of CSE and CSIT

Course Name: Software Development Project-1

Course Code: CSE – 2100

Problem Definition Document on

"Library Management system"

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Introduction:

A **Library Management System (LMS)** is a digital solution aimed at automating and streamlining the processes involved in managing a library. The system ensures efficient cataloging of books, management of user records, tracking of borrowing and returning activities, and improving overall library management. The current traditional methods are time-consuming and error-prone, especially for large libraries with substantial book inventories and large user bases. By digitizing the library operations, the LMS enhances productivity, reduces errors, and provides a better experience for both users and staff.

Problem Statement:

Traditional library systems rely heavily on manual processes for managing the inventory of books, tracking loans, and recording transactions, which results in inefficiency, human errors, and poor user experience. As libraries expand and the volume of books and users increases, these manual systems become increasingly difficult to maintain. There is a critical need for an automated, efficient system that will ensure quick access to books, easy management of user records, and overall system automation to save time and reduce errors.

Project Objectives:

- **Automate book cataloging and inventory management** to eliminate errors and inefficiencies.
- **Track book lending and returns** automatically, reducing the chances of lost or overdue items.
- **Enable easy access to library users** for searching and borrowing books.
- **Provide real-time notifications** about overdue books and upcoming due dates for both users and librarians.
- **Generate reports and analytics** to support better decision-making and library management.
- **Ensure data security and privacy** for users and staff.

Preliminary Solutions:

To address the problems mentioned above, we have proposed the following preliminary solutions:

1. **Solution 1: Software-Based Library Management System**
   A custom-built software application to digitize the entire library management process, from cataloging books to tracking user transactions. This solution will provide a user-friendly interface for both staff and users to perform all necessary functions.
2. **Solution 2: Outsourcing the Library Management**
   Outsource the library management to a third-party service provider who would implement and manage the library system. This would relieve the library staff from the burden of managing the system but may limit flexibility.
3. **Solution 3: Manual System Enhancement**
   Increase the efficiency of the manual system by employing more staff and resources for better organization, though this will still be subject to human error and inefficiencies.

Project Scope and Functionalities:

Solution No	Functions	Features	Facilities
01	Automating the process of cataloging books, managing inventory, tracking borrowing and returns, providing real-time updates for overdue books, and managing user data.	Searchable book catalog, member login and registration, real-time updates, automated reminders for overdue books, and detailed reports on library usage.	Centralized control of all library operations, efficient data handling, and user-friendly interfaces for both staff and users.
02	Outsourcing the entire management of the library's digital system.	Management by third-party service providers, reduced internal management overhead, customized features by the provider.	Somewhat flexible but less control over the system's implementation and updates.
03	Enhancing manual processes through increased staff.	More staff handling book cataloging and transaction processes, but no digital automation.	Still subject to inefficiencies and errors that come with manual data entry.

Cost Estimation:

- **Development Cost (for Solution 1):** BDT 3,00,000 (approximately)
- **Budget for Project:** BDT 5,00,000 (including development and implementation costs)

Ongoing Maintenance (yearly):
BDT 30,000

Estimation for Feasibility Study:

A feasibility study is essential to evaluate the viability of the proposed solutions. It focuses on three main areas:

- **Operational Feasibility**: Ensuring the system will meet the library's needs and that staff and users will be able to use it effectively.
- **Technical Feasibility**: Verifying that the proposed system can be built using available technology and that the technology is scalable and sustainable.
- **Economic Feasibility**: Ensuring the costs associated with the system are manageable and within the library's budget.

The feasibility study will help make a decision on which solution to pursue. The estimated cost and time required for the feasibility study are outlined below:

Cost Breakdown for Feasibility Study:

Serial No	Tools and Requirements	Cost (BDT)
01	Personnel Cost	1,50,000
02	Communication and Travel	20,000
03	Marketing and Administrative	15,000
04	Training	10,000
Total		**1,95,000**

The **feasibility study** will cost approximately **BDT 1,95,000**, and the study will take **4 weeks** to complete.

Conclusion:

By implementing a **Library Management System**, we expect to eliminate the inefficiencies of the manual process, improve the library's overall management, and enhance user experience. The **Software-Based Solution (Solution 1)** is highly recommended due to its automation capabilities, ease of use, and scalability. It ensures a robust, error-free environment for both library staff and users, with minimal operational costs in the long term.