A REPORT ON
LIBRARY MANAGEMENT SYSTEM

By

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220643

Mentored by:

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Prepared in the partial fulfillment of the
Practice School II Course

AT

PES Online Services

OFC No. 106, 1st Floor, SSR

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BML MUNJAL UNIVERSITY

(July, 2024)

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Services Offered : Under take AMC of Energy Meter and related Communication System
Online billing and Managing Prepaid Energy Metering System

August 12, 2024
Emp Code: PES0101
Anshul Yadav

To Whom It May Concern

This is to certify that **Anshul Yadav** was employed at PES ONLINE SERVICES for the period of **June 3,2024** to **July 26,2024**. He was designated as **Web Developer** at the time of separation from the organization.
Anshul Yadav stand relieved of his duties with PES ONLINE SERVICES with effect from close of business hours July 26,2024.
We wish him all the best in his future endeavors.

Thank you

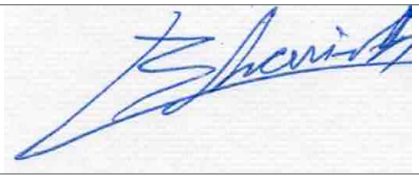
Best regards,
PES ONLINE SERVICES

For PES ONLINE SERVICES
Proprietor

Work : 95, Village Mirzapur, opp. Govt. School, Sec-73, Ballabgarh, Faridabad(Hr.)-121004

CERTIFICATE

This document certifies that the project titled **"Library Management System"** completed by **Anshul Yadav** was conducted under my guidance and supervision. To the best of my knowledge, this work is original and has not been submitted elsewhere. Any contributions from other sources have been duly acknowledged. The project was undertaken at **Pes Online Services** between **June 3** and **July 26, 2024**.

	
PS-II Faculty Mentor signature	**Industry Mentor/Supervisor signature**
Name: Dr. Himanshu Upreti	**Name:** Mr. Bhavish Yadav
Designation: Assistant Professor	**Designation:** IT Department Head
Date: 8th August, 2024	

BML MUNJAL PRACTICE SCHOOL - II
JOINING REPORT

20/06/2024

Name of the Student	Anshul Yadav
Name and Address of the PS– II Station	PES Online Services Address: OFC No. 106, 1st Floor, SSR Corporate Park, 13/6 Mathura Road, NH-2
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Actual date of reporting to PS-II station	03/06/2024
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Acknowledgement

I am deeply indebted and sincerely acknowledge the following individuals who have shown immense help and support in providing their valuable guidance for the successful completion of this project on library management.

Finally, I would like to thank the Vice Chancellor and the Dean, School of Engineering and Technology, for availing the opportunity to undertake an internship and continuous support in undertaking the project.

I am deeply grateful to the PS program coordinators for their guidance and encouraging spirit. Their expertise has been extremely useful in shaping this project.

I would like to express my deep gratitude to Mr. Bhavish Yadav, Head of the IT Department, for giving valuable guidance and mentorship. His insights into the industry have been necessary for this project.

I would additionally like to extend my thanks to Dr. Himanshu Upreti for the continued support and guidance in the academic pursuit. His expertise was invaluable to completing this project successfully.

Abstract

This project aims to develop a computerized system to efficiently manage library operations. The system automates tasks such as book cataloguing, member registration, book borrowing and returning, and generating various reports.

This project builds a user-friendly library management system to streamline operations. Developed with ASP.NET, C# (C-Sharp),and MySQL, it automates tasks like cataloging books, registering members, borrowing/returning items, and generating reports. Separate interfaces for librarians (admin) and users ensure smooth workflows. By automating core functions, the system improves accuracy, reduces manual work, and provides valuable insights. This translates to a more efficient library and a better experience for everyone.

The system successfully automates core library functions, improving accuracy, reducing manual effort, and providing valuable insights through generated reports. It enhances overall library efficiency and user satisfaction. By automating core library processes, the system significantly enhances accuracy, reduces manual errors, and generates valuable insights through detailed reports. This leads to improved library efficiency, increased user satisfaction, and optimized resource utilization.

Table of Contents

Introduction of the organization's business sector

The main area or business sector in which the organization operates in manufacturing and online services.
The manufacturing of meters is a part of the energy and utility industry, comprising designing, manufacturing, and distributing meters that will be used to measure electricity consumption.

Key aspects of the meter manufacturing sector include:

- **Product range:** Electricity Meters – Single-phase, three-phase, smart meters.
- **Tech advancement:** Advanced technologies integrated, like IoT, data analytics, and communication protocols in smart metering solutions.
- **Quality standards:** Strict standards of quality and accuracy, as prescribed by the regulatory bodies.
- **Research and Development:** Bring continuous innovation in developing new models of meters and improvement of existing models.

The influence of technology and the metering industry has resulted in the realization of online meter services. These services are targeted at enhancing meter management, customer experience, and data utilization.

Key components of this sector include:

- **Meter Data Management:** This includes the secure storage and management of meter readings, consumption data, and customer information.
- **Advanced meter reading (AMR):** Remote meter reading by utilizing various communication technologies in meter data collection.
- **Advanced metering infrastructure (AMI):** the implementation of a complete network carrying two-way communications between meters and utility providers.
- **Data Analytics:** meter data transforming into trend spotting, anomaly detection, and energy-use optimization.
- **Customer portal:** provision of an online, secure channel for customers to view meter readings, billing information, and energy consumption patterns.
- **Billing and payment:** The ability to integrate into billing systems and to provide online payment.

A. Overview of the organization

- Brief history

  It is a specialist organization working as a manufacturer and supplier of Three and Single-Phase Prepaid /& Postpaid Energy Meters, Energy Management Communication Hardware, Management Software, etc. Because of easy installation/ operation, contemporary design, reliability, and long life of the products, these are extensively in demand.

- Business size

  The exact number of employees and financial details such as total number of stocks or commodities are not publicly disclosed.

- Product lines (list complete range of products/services)

1. Three Phase Meter

   Three Phase Dual Source Panel Meter
   Three Phase Dual Source Prepaid Energy Meter Meter
   Three Phase Dual Source KWH Meter
   Three Phase Dual Source Multifunction Meter
   Three Phase Single Source Panel Meter
   Three Phase Single Source Prepaid Energy Meter
   Three Phase Single Source KWH Meter
   Three Phase Single Source Multifunction Meter

2. Single Phase Meter
   Single Phase Dual Source Prepaid Meter
   Single Phase Dual Source KWH Meter
   Three Phase Single Source Prepaid Meter
   Three Phase Single Source KWH Meter
3. WiFi Smart DG-Mains Plug
4. Energy Management Communication Hardware
   DTRH (Data Transfer and Receiving Hub)
   GPRS Modem
5. Management Software
6. Home Display Unit
   Wired Display Unit
   Wireless Display Unit
7. Home Indicator Unit

- Brief summary of all departments

Meter Manufacturing Department -

Research and Development (R&D): Focuses on developing new meter technologies and improving existing products.

Production: Oversees the manufacturing process, quality control, and assembly of meters.

Supply Chain Management: Handles receiving of raw materials, components, and logistics.

Quality Assurance: Ensures product quality according to industry standards.

Online Meter Services -

IT Department: Develops and maintains software applications, databases, and network infrastructure.

Customer Support: Provides assistance to customers regarding meter readings, billing, and issues.

Data Analytics: Extracts valuable insights from meter data for business decisions.

Sales and Marketing: Promotes online meter services and acquires new customers.

B. Plan of your internship program

Introduction of the Department:
During the internship, I worked with PES Online Services in their IT department. The team that I am going to join specializes in the development and maintenance of websites and web applications to make sure that they are functioning properly, user-friendly, and pleasing to the eye of the users.

Internship Duration:
Start Date: June 3, 2024
End Date: July 26, 2024

Departments Visited:
Throughout my internship, I had the opportunity to visit and collaborate with the following departments:
IT Services Department: Duration - 5 weeks
Manufacturing Department: Duration - 1 week
Project Making: 1 week

Project responsibilities:
I was introduced to a new framework .NET, as it is mainly used in the company workspace and it take lakhs of inputs from different places at a single server.
I was required to ensure that I learn everything on day to day basis followed by a practice problem. And required to complete on time and continually apply previously learned concepts.
Project Assignment:
I was assigned with 3 minor projects (Student registration, Library manager, dashboard) and 1 major projects (Library management system)

C. Background and description of the problem

Introduction

This paper presents the design and implementation of a Library Management System that will allow smooth library operations and a better user experience. Traditional library management methods, such as manual record-keeping, inefficient circulation of books, and limited availability to library resources, have various issues. This LMS aims to harness modern technologies in the automation of various library processes with an interface that offers better management of data and easier use for librarians and patrons.

Background

Libraries, through their intensive work and huge services, have contributed a lot to the societies in which they live during the past several hundred years as leading archives of knowledge and cultural heritage. Traditional library management systems, however, have usually not kept pace with increasing demands in access to information. Laborious processes, paper-based documentation, and little automation characterize traditional library management. The newest digital technologies that have evolved in modern times have opened up newer possibilities for changing library services by laying the base for strong, user-oriented Library Management Systems.

Problem Statement

The primary challenge addressed in this report is the development of a comprehensive LMS that effectively manages library collections, user accounts, circulation processes, and cataloging. The system should automate routine tasks, improve data accuracy, and provide advanced search and retrieval capabilities.

Reasons for Interest

The importance of an efficient and user-friendly LMS lies in a number of reasons.

1. It can greatly improve the experience of being in the library by providing easy and fast access to information.

2. It will be better positioned to optimize library operations through the automation of time-consuming tasks, reduction of errors, and improvement of staff productivity.

3. This can also foster data-driven decisions through insight into library usage patterns and resource use that the LMS can provide.

4. It can enable the development of new services in libraries, such as digital collections, online reservations, and personal recommendations.

Method of Attack

To address the challenges and achieve the objectives of this project, a systematic approach was employed. The development process involved the following key stages:

- **Requirement Analysis:** Detailed analysis of library operations, user needs, and existing systems for the identification of functional and non-functional requirements.
- **System Design:** Describes how the system will be designed to include database design, user interface, and system modules.
- **Development and Implementation:** Developing the LMS application in languages and technologies applicable to it, with associated testing and deployment.
- **User Testing and Evaluation:** testing the functionality, usability, and performance of the system, followed by incorporation of the feedback from users.
- **System Deployment and Maintenance:** The installation of the LMS in a target library environment, with associated ongoing support and updating.

This section provides a detailed account of the Library Management System (LMS) development process, including the methodologies employed, the system's architecture, implementation details, and the results obtained.

System Architecture

The LMS architecture is based on a **client-server model**, utilizing a three-tier structure:

- **Presentation Layer:** The user interface is developed using HTML, CSS, JS, .net framework. It will provide a friendly platform for interaction with the system.
- A**pplication layer:** is built using C#, handling business logic to interact with the database.
- **Data Layer:** Library-related information, including details of the books and members' records, is maintained along with circulation history in a database implemented using MySQL.

System Functionalities

The LMS incorporates the following core functionalities:

- **Book Management:** Allows for a quick introduction of Books with Classifications.
- **Member Management:** It will facilitate the user to sign up and manage.
- **Circulation Management:** Book issues and return.
- **Generation of Reports:** This generates total comprehensive reports on library total issues, total penalties.

Implementation Details

The LMS was developed using .net framework, C-sharp and MySQL. The development process involved the following steps:

- **Database design:** This involves creating database tables, relationships, and indexes.
- **User Interface Development:** Design and implementation of friendly screens for use with a variety of system functionalities.
- **Testing:** This comprises rigorous testing of the system for reliability, performance, and security.

Results and Discussion

The developed LMS demonstrates the following key features and benefits:

- **Improved efficiency:** Automation of the previously manually performed tasks, such as cataloging of books or circulation processes of libraries, will save a lot of time for library workers.
- **Accurate Data Management:** Centralized database ensures accurate consistency and integrity of the data.
- **Real-time information:** Information about which books are available and information on members' statuses.

Discussion of Result

- **Platform Development:** Workable educational platform developed with user-friendly core features like course management, real-time interactions, and secure authentication.
- **Performance Optimizations:** Database query optimization and caching implemented for improved responsiveness and load times of the platform.
- **User Feedback:** Testing phases well-received by users with minor adjustments and feature enhancements.

Outcomes

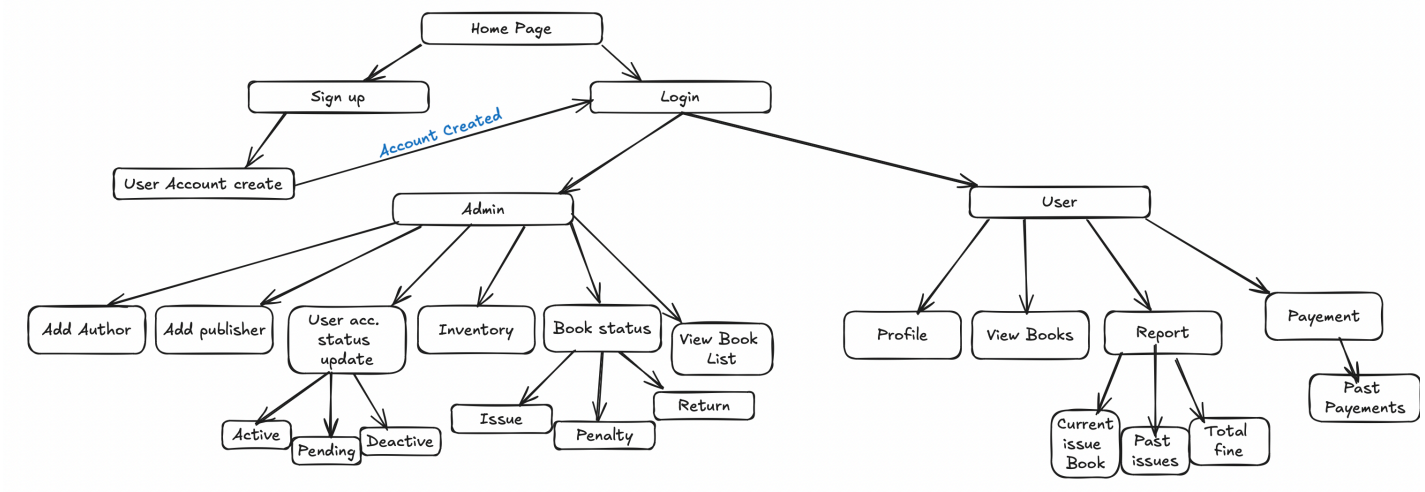
- Developing a functional Library Information Management System with key features.
- Increased operational efficiency and accuracy of library activities.
- Improved user experience with user-friendly interface.
- Improved Technical Skills: Developed practical experience with .Net framework in front-end and C-sharp in the back-end, besides MySQL for database management.

Conclusions and Recommendations

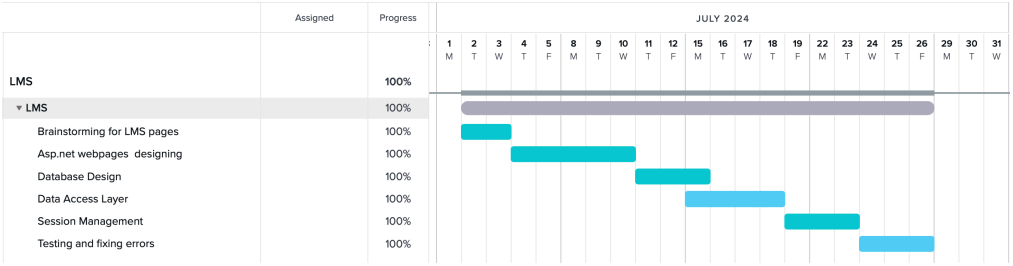
- This basically automates library procedures, hence reducing the level of manual effort and errors.
- The user-friendly interface allows for increased satisfaction and engagement of the patron.
- The system is beneficial in providing useful data for library management and decision-making.
- It is advisable that - Ensure that with new features and technologies, the system is regularly updated.

Appendices

Appendix The following appendices support the main content of the report. These are meant to expand further on specific technical aspects, methodologies, and data which were critical in the development process of the Library Management System.



Appendix A : Flowcharts



Appendix B : Gantt Chart

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