**A Proposed Library Management System at Navotas City Library**

A Deployment Documentation Presented to the

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**DEPLOYMENT DOCUMENTATION**

**INTRODUCTION**

The Library Management System (LMS) was designed and developed to streamline book cataloging, borrower registration, and transaction tracking within a library environment. The system automates routine library operations such as book issuance, returns, fine calculations, and inventory management, reducing manual errors and improving efficiency. It is built using VB.NET with a Microsoft SQL Server backend to ensure secure and accurate data storage.

This documentation focuses on the deployment process, which outlines how the system is installed, configured, and made operational in the library’s environment. It provides detailed setup instructions, configuration guidelines, and post-deployment verification steps to ensure smooth and successful installation.

The main objective of the deployment process is to ensure that the Library Management System is correctly installed and fully functional on any Windows computer with minimal technical setup.

The deployment package includes all necessary components such as:

* The system executable file (LibrarySystem.exe)
* The database files (LibraryDatabase.mdf and LibraryDatabase\_log.ldf)
* The SQL Server LocalDB installer
* An automated setup script (.BAT file)
* A configuration file containing default login credentials (accounts.txt)

Through the automated batch file, the deployment process installs SQL Server LocalDB, attaches the library database, and launches the application — eliminating the need for manual SQL configuration and ensuring a consistent installation experience across all devices.

The deployment process supports both standalone installations (for single-computer setups) and network configurations (where multiple users can access a shared central database).

Each workstation can either run its own LocalDB instance or connect to a centralized SQL Server, depending on the library’s network and operational requirements.

**DEPLOYMENT PLAN**

Before the installation of the Library Management System (LMS), a structured deployment plan is implemented to ensure a smooth and error-free setup process. This plan outlines the key phases of deployment, including task descriptions, timelines, and completion statuses to maintain organized and efficient implementation.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Phase** | **Description** | **Start Date** | **End Date** | **Status** |
| **Pre-Deployment** | Preparation of the complete deployment package containing the executable program, library database, and required setup components such as SQL Server LocalDB and configuration scripts. | 10/01/2025 | 10/02/2025 | Completed |
| **Deployment** | Installation of SQL Server LocalDB, attachment of the **LibraryDatabase** files, and configuration of the connection settings. The system is then tested for basic functionality such as login, book search, and borrowing transactions. | 10/03/2025 | 10/03/2025 | Completed |
| **Post-Deployment** | Final testing of all modules, validation of data operations, and conduct of user orientation for librarians and staff on how to use the system effectively. | 10/04/2025 | 10/04/2025 | Completed |

**Table 1: Deployment Plan**

This deployment plan ensures that all critical steps — from setup preparation to user readiness — are completed systematically. It guarantees that the Library Management System is properly installed, configured, and fully operational in the intended environment

**DEPLOYMENT ENVIRONMENT**

This section defines the hardware and software requirements necessary to successfully install and run the Library Management System (LMS). Ensuring that the deployment environment meets these specifications guarantees stable performance, compatibility, and reliability during library operations.

**Hardware Requirements**

* Operating System: Windows 10 or Windows 11 (64-bit)
* Processor: Intel Core i3 or higher
* RAM: Minimum 4 GB (8 GB recommended for smoother performance with large databases)
* Storage: At least 2 GB of free disk space for application and database files
* Display: Minimum resolution 1280 x 720 for proper UI rendering

**Software Requirements**

* Database: SQL Server LocalDB 2019 (included in the deployment package)
* .NET Framework: Version 4.8 or later
* VB.NET Runtime: Included by default in Windows
* Additional Libraries: Guna.UI2 WinForms for enhanced user interface components

This deployment environment ensures that all modules of the Library Management System, including book management, borrower registration, transaction processing, and reporting, function correctly and efficiently

**DEPLOYMENT PROCEDURES**

This section provides a detailed guide for installing the Library Management System (LMS) from start to finish. It covers pre-installation preparations, installation execution through the automated .BAT file, and post-deployment verifications to ensure proper system operation.

**Pre-Deployment Steps**

* Copy the entire deployment folder LibrarySystem to the target computer’s C:\ drive.
* Ensure that Windows Defender or any antivirus software is not blocking .BAT or .EXE files.
* Verify that the target machine meets all hardware and software requirements.

Deployment Execution (install\_localdb.bat)

The install\_localdb.bat script automates the complete setup process, including:

* Installing SQL Server LocalDB 2019
* Attaching the LibraryDatabase.mdf and LibraryDatabase\_log.ldf files
* Launching the LibrarySystem.exe application

Steps:

* Open the .BAT file.
* The script will automatically install LocalDB if not already present.
* The database will be attached automatically.
* After completion, the system will launch LibrarySystem.exe.

**Post-Deployment Verification**

Open the application

Test core functionality:

* Add a new book to the catalog.
* Register a new borrower.
* Record a borrowing and return transaction to confirm data saving works.

Optionally, verify database attachment via SSMS.

Ensure required folders exist and are accessible:

* C:\LibrarySystem\Books\
* C:\LibrarySystem\Borrowers\
* C:\LibrarySystem\Backups\

Perform a test backup using the system’s Backup Database function to confirm the database connection and backup process are stable.

This procedure ensures that the Library Management System is installed correctly, the database is properly attached, and all modules are operational for immediate use in library management tasks

**USER TRAINING & SUPPORT**

Before the Library Management System (LMS) is fully handed over to library staff, basic training and user orientation are conducted. This ensures that users can operate the system efficiently, manage daily library operations confidently, and handle core functions such as book lending, returns, and record keeping

**Training Topics**

|  |  |
| --- | --- |
| **Topic** | **Description** |
| **System Overview** | Understanding the system layout, dashboard navigation, menu options, and login procedure. |
| **Book & Borrower Management** | Learning how to add new books, update book information, register borrowers, edit profiles, and view records. |
| **Borrowing & Returning Books** | Demonstrating how to issue books to borrowers, process returns, calculate overdue fines, and update transaction history. |
| **Backup & Restore** | Training users on how to manually back up the database and restore it when necessary. |
| **Reporting & Search** | Using built-in reports and search functions to track borrowed books, overdue items, and inventory status. |

**Table 2: Training Topics**

Files Provided

Accounts.txt – Contains default login credentials for administrators and staff.

This training ensures that all library personnel can efficiently perform day-to-day operations, maintain accurate records, and utilize backup features to safeguard data

**RISKS & CONTINGENCY PLAN**

Even with an automated deployment process, the Library Management System (LMS) may encounter issues due to environmental factors or user actions. This section identifies potential deployment risks and provides contingency measures to minimize downtime and ensure a stable installation.

|  |  |  |
| --- | --- | --- |
| **Risk** | **Impact** | **Solution / Contingency Measure** |
| **LocalDB not installing** | High | Run the .BAT file as Administrator and verify that Windows Installer is functioning properly. |
| **Database failed to attach** | Medium | Ensure LibraryDatabase.mdf and LibraryDatabase\_log.ldf are not set to read-only and are placed in the correct folder. |
| **Missing or moved setup files** | Medium | Keep all deployment files in a single folder (e.g., C:\LibrarySystem) before executing the .BAT file. |
| **Antivirus blocks script** | Low | Temporarily disable real-time protection in Windows Defender or any third-party antivirus during installation. |
| **Wrong SQL instance used** | Low | The .BAT script defaults to (localdb)\MSSQLLocalDB; ensure no conflicting LocalDB instances are active before deployment. |
| **Insufficient user permissions** | Medium | Make sure the installing user has administrative privileges on the computer. |

**Table 3: Deployment Risks and Contingency Measures**

Having these contingency measures in place ensures faster recovery, prevents common deployment failures, and maintains stable system operation for library staff immediately after installation

**DEPLOYMENT VERIFICATION & SIGN-OFF**

After the successful installation and initial testing of the Library Management System (LMS), both the developer and the library representative confirm that all system requirements are met and that the application is functioning correctly.

|  |  |
| --- | --- |
| **Task** | **Status** |
| LocalDB installed successfully | Check |
| LibraryDatabase attached without errors | Check |
| LibrarySystem.exe connected and launched | Check |
| Default account login verified | Check |
| Backup and restore tested successfully | Check |
| Basic transactions (add book, register borrower, borrow/return) verified | Check |

**Table 4: Checklist**

This checklist ensures that all deployment objectives are completed and the system is ready for operational use by library staff.

**Sign-Off Sheet**

This sign-off confirms that the deployment was successfully completed, and both parties acknowledge that the Library Management System meets the agreed functionality, performance, and operational requirements.

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