Software Requirements Specification

for

Laboratory Inventory Management System

Version 1.0

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1. Introduction

1.1 Purpose

An inventory system's purpose is to monitor the items and supplies. Lab inventory management systems allow labs and scientific research institutes to simplify overall lab administration; by performing lab inventory activities effectively, the whole lab gains greater productivity. With lab inventory management software, laboratories can monitor inventory, analyze stock levels, predict stock reordering, and avoid resource tracking mistakes. These solutions offer easy labeling and documenting, as well as the maintenance of auditable records and databases, as well as procurement and scheduling. For a standard product inventory system, a large number of forms and booklets were needed to list inventories, and data were entered manually. The information may be misplaced or even lost. This traditional method should be replaced in the future with a user-friendly and more systematic approach. The primary objective is to assist the laboratory worker in managing the data for each piece of equipment. Therefore, it will assist technicians in efficiently searching, editing, updating, and deleting equipment and component information. This project enables us to simply access and manage the information, as well as check the existing stock of equipment and update it as required. This project minimizes the time required to locate a product in the existing inventory. This paper describes http://www.(website link) software, which is web-based software. This document is to give the Inventory Management Software Requirements Specifications for the Communication Laboratory at Bangladesh University of Professionals. This document is intended to record the requirements for the software's design and development. The software is created for the general purpose of the communication laboratory by the requirement of lab technicians, faculty members and students. The software may need upgrades in the future. The document represents the project's current needs as understood by the project team. This document provides an initial explanation of the software's many capabilities and services. The document will also serve as the foundation for user acceptability testing. [1] [2]

1.2 Document Conventions

We adhered to the IEEE format throughout. We used the same font, Times New Roman, in sizes 16 for heading 1, 14 for heading 2, and 12 for heading 3.

IEEE: The Institution of Electronic and Electrical Engineering.

SRS: Software Requirement and Specification.

OS: Operating System.

GUI: Graphical User Interface.

1.3 Intended Audience and Reading Suggestions

The web designers who are testing and contributing to the software are the people who should study this content with the utmost attention. It is important for the users of the system, including the Lab In-charge, Lab Technicians, and Lab Attendant, to read this SRS and familiarize themselves with the requirements. In the other sections of this SRS, the operational needs are broken out in further detail.

1.4 Product Scope

Managing all products, sufficient stocks, sales records, also analyzing sales and reordering from time to time is a difficult job. To do it more effectively and correctly a better inventory control is required, which is provided by our software.

The proposed project target is to achieve a systematic and automated Laboratory Inventory System for the Communication Laboratory.

- This project will improve data security. The most important for data inventory is the safety. Using this invented LIS database, all data about equipment and component record will be kept in a database. By using this database concept, the problems such as data loss and damage can be avoided.
- The project will ease the user in checking equipment and component status. By using this system, technician and staffs can check the equipment and component status faster. The technicians and staffs do not need to wait for a long time to check it in files like before.
- This system will provide some functions such as searching, update, to help the technicians and staffs in controlling the data applications. The searching and updating issue will be improved as the technicians and staffs can search and update the data systematically.

- The system will Monitor and track inventory, stock, equipment, and/or other types of laboratory resources.
- The system will optimize inventory workflow and simplify material requests.
- The system will reduce lab waste by keeping track of expiration dates and quantities used. [3]

1.5 References

[1] Hashim, N. M. Z. (n.d.). Laboratory inventory system - IJSR. Retrieved August 21, 2022, from https://www.ijsr.net/archive/v2i8/MDIwMTMyNDg=.pdf

[2] Verma, Y. (2022, February 24). Tag: Inventory management system project SRS document. Projectworlds. Retrieved August 21, 2022, from https://projectworlds.in/tag/inventory-management-system-project-srs-document/?fbclid=IwAR1ywGwCTo4H3-TuXPToC2aY_xc846z1M5NfN6MxWi_VvH-XWMFGurH_wug

[3] Laboratory Inventory Management System - BrightLab - Milliporesigma. BrightLab. (2020, November 18). Retrieved August 21, 2022, from https://www.brightlab.com/lab-inventory-management-software/

2. Overall Description

2.1 Product Perspective

The web based software, Laboratory Inventory Management System, created for Bangladesh University of Professionals, is an independent project and does not rely on any other product or larger system. The purpose of the site is to automate the register system used for counting, managing, monitoring and maintaining different laboratory equipment of different courses. It aims to provide better handling of equipment details and a better organizing scheme of the stored information for smooth conduction of the equipment in storage. It is created depending solely on the requirements provided by the University and limits its scope of usage to the authorized users.

2.2 Product Functions

This part provides a clear overview of the functional attributes of the finished product.

2.2.1 Admins

- Admin can add Lab Technician, add the teachers etc.
- Provide ID and Passwords to Lab Technicians, Teachers etc.
- Manage and update the details of the equipment.
- Maintain a logbook for the equipment.
- Continuous observation and integrating details of each purchased equipment including vendor & supplier details.

2.2.2 Super Admin

- Super Admin is in charge to appoint the Lab In-charge.
- Can add/delete any of the users.
- Monitors all the changes and updates of equipment details.

2.2.3 Lab In-charge

- Be able to view every detail regarding the equipment present in the inventory.
- Be able to view the status of every equipment.
- Can add or delete any new or existing equipment.
- Update details of suppliers and vendors.
- Update the courses for which equipment is stored.
- Appoint Lab Attendants and provide Lab Manual for the use of the equipment.

2.2.4 Lab Technician

- View the details and update the details of each equipment.
- Be able to lend out equipment to the borrowers (teachers & students).

2.2.5 Lab Attendant

- Be able to view the details and availability of equipment.

2.2.6 Teachers

- View the equipment details and availability.
- View and download the laboratory manual.

2.3 User Classes and Characteristics

- The users of Laboratory Inventory Management System are Admins, Super admin, Lab technicians, Lab in-charges, Lab attendants and the teachers.
- Super admin, Lab attendants and Teachers are expected to have basic knowledge about computers and web browsing.

- Admins, Lab technicians and Lab attendants should have better understanding of the inside module to regulate the changes and be able to rectify small problems and combat issues regarding crashes, incorrect changes, power failures etc.

2.4 Operating Environment

The Laboratory Inventory Management System is a web-based software and will be able to run on all existing popular platforms such as for a model we are taking Microsoft edge, Google Chrome, and Mozilla Firefox. It is mostly designed to work on the Windows Operating System. The processor for the computer in use should have the minimum specification of Intel Core i3 8th generation (8109U) or above along with a 4GB RAM or above. The hard disk in use should have 1Tb or less capacity for proper functionality of the software.

2.5 Design and Implementation Constraints

- The ID, passwords, information of the users and the details of the user should be stored in a database accessible by the software. MySQL would be the required database system for this.
- The front end is designed with the use of HTML5, CSS3, JavaScript and Bootstrap while the backend is designed using PHP.
- The framework for the site is implemented using Laravel and the editor side uses Visual Studio Code.
- The site must be able to perform 24 hours of the day and accessed whenever needed.
- Acknowledgement of the correct ID and passwords should be ensured for the software to be accessed by the users on any regulatory computer.

2.6 User Documentation

The SRS provides a written documentation of the planning and implementation procedure of the product approved by the client. It works as a guide for the requirements approved and a manual for any future user with the details and functionality of the product.

2.7 Assumptions and Dependencies

- The admin and lab in charge is able to update the information anytime. For this security must be maintained with proper authentication.
- Proper documentation of the data should be updated in the database.
- It is dependent on MySQL for database purposes and requires ASP.net to develop the product.

3. External Interface Requirements

3.1 User Interfaces

The front-end view through which the user interacts with the software is the user interface of the software. The users of the lab inventory management software are the admin, super admin, and lab in charge, lab technicians and the teachers.

The jobs of each users are different for this software so their interfaces after logging in to the software will be different. With the help of HTML, CSS, JavaScript and bootstrap the software's web pages will be formatted, designed, made responsive and interactive. The different user interfaces are explained below:

3.1.1 Log-in Interface

The log in interface will help the users to get into the software and do their respective duties. This interface will contains a form that will contain:

- User ID
- Password

Then the form is to be submitted using a "Submit" button, which will allow the user to get into the next interface. If the User ID or Password are not relevant or correct then it will show "Incorrect Password".

There will be an option if any user forgets the password, which is "Forgotten Password" which will allow the user to set-up a new password.

3.1.2 Admin Control Panel

The admin will control the overall inventory and the users of the software. The admin will have a Dashboard, which will show proper availability of each equipment. The options the Admin interface will have are:

- Dashboard
- Manage Employee
    1. Lab In-charge
    2. Lab Technicians
    3. Lab Attendant
- Manage Equipment
- Log Book
- Orders
- Reports
- Vendors

Through these options, the Admin can see the overall condition of the Communication Lab. Through Manage employee, the Admin can add or delete any employee and can assign them with respective user ID and Password.

3.1.3 Lab In-Charge Interface

The Lab In charge interface will mainly have the overview of the equipment details. The interface will contain options like the following:

- Equipment
    1. Equipment ID
    2. Equipment Name
    3. Model No.
    4. Receiving Date
    5. Available Quantity
    6. Date of Expiration
    7. Warranty Period
    8. Price
- Equipment Status
    1. Total Quantity
    2. Available Quantity
    3. Borrowed Quantity
    4. Out For Servicing
    5. Damaged

- Supplier
- Lab Courses
- Lab Attendant
- Lab Manual

The equipment details can be seen with help of Equipment. In addition, the status of each equipment if it is available or not can be seen using equipment status. The supplier details will help to show the details of the suppliers from whom the equipment are bought. Lab courses will show which lab equipment are required for which lab and the Lab attendants can be added or deleted with the help of lab attendant option. The lab Manual will help to show all the details and steps to be remembered while using each equipment.

3.1.3 Lab Technician Interface

The Lab Technician interface will consist of the things related to the Equipment. He will also have the option to lend equipment to students or teachers with having the proper documentation of borrower. The interface will have the options like:

- Equipment
- Equipment Lending Details

3.1.4 Lab Attendant Interface

The lab Attendant interface will only contain the details of the Equipment. As the attendant just have to attend the lab so, he can just see the availability of equipment if required.

- Equipment
- Lab Courses Timetable

3.1.5 Teachers Interface

This interface will show the following options:

- Equipment Status
- Laboratory Manual

So, as user interface is mainly the visual representation of the software towards the user so in the above sections we discussed about what each user will get after they get to log inside the software.

For every user after the admin give them there ID and password, they can change their password so all of them will have a profile in which they can give or change their contact details

and they can give their desired password for further login options. Therefore, the users will have a Profile link and through which they will get a form for editing their profile.

3.2 Hardware Interfaces

The hardware interfaces are given below in tabular form:

Category	Configuration
Device	PC , Laptop
Operating System	Windows
Processor	Intel® Core i3 8th generation (8109U) or above
RAM	4GB or Above
Hard Disk	1TB or less

3.3 Software Interfaces

The software interfaces used for the software are stated below:

Database	MySQL and XAMP for MySQL
Front-End	HTML5, CSS3, JavaScript and Bootstrap
Back-End	PHP
Framework	Laravel
Editor	Visual Studio Code

3.4 Communications Interfaces

Communications functions required by this product, including e-mail, web browser, network server communications protocols, electronic forms, and so on.

1. Web Browsers:

Google Chrome (latest version)	Windows, Mac OS X, iOS, Android
Apple Safari (latest version)	Mac OS X, iOS
Microsoft Edge (latest version)	Windows
Mozilla Firefox (latest version)	Windows

2. Network server communications protocols:

The operating system should support-

- TCP (Transfer Control Protocol) / IP (Internet Protocol),
- SMTP (Simple Mail Transfer Protocol),
- FTP (File Transfer Protocol),
- HTTP (Hyper Text Transfer Protocol) and
- HTTPS (Hyper Text Transfer Protocol Secured) protocols.

3. The Contact forms are also another medium for communication.

4. System Features

4.1 Login

4.1.1 Insert ID and Password

This is to login within the software by the given ID and password to the authorized users.

4.1.2 Error Notification

If the entered ID or password fails to match the one's stored in the database, a pop up with the notification of "Incorrect ID/ password" will be displayed.

4.1.3 Password Change

If a user has forgotten their password, their registered email may be used to retrieve or update the database.

4.2 Manage Employee

4.2.1 Super Admin

Super admin will appoint the Lab in-charge and Admin.

4.2.2 Admin

Admin will manage the overall inventory. He will have the options to add or delete any equipment, add the Lab in-charge as well as other employees. He will also upload the course materials.

4.2.3 Lab In-charge

Lab in-charge will monitor the system and examine the specifics, costs, and quantities of every equipment.

4.2.4 Lab Attendant

The Lab Attendant can only see the availability and details of all equipment.

4.2.5 Lab Technicians

The Lab Technician can lend equipment to teachers and students and update the lending details. He can also add or delete any equipment when needed.

4.3 Equipment

4.3.1 Equipment Details

4.3.1.1 Equipment ID: Each equipment will have its own ID.

4.3.1.2 Equipment Name: Equipment can be searched by its name.

4.3.1.3 Model No: Model number of individual equipment will be stored in the database.

4.3.1.4 Receiving Date: Date of purchase will be updated in the database.

4.3.1.5 Date of Expiration: The date of expiration will also be stored in the database for viewing.

4.3.1.6 Warranty Period: Warranty details would be stored as well to repair equipment with time.

4.3.1.7 Price: Pricing of each individual equipment will be stored in the database.

4.3.1.8 Supplier: The detail of the supplier from whom an equipment is bought will be stored.

4.3.1.9 Vendor: The detail of the vendor from whom an equipment is supplied to the supplier will be stored.

4.3.2 Equipment Status

4.3.2.1 Total Quantity: Total number of equipment of the same category stored in the database.

4.3.2.2 Available Quantity: Total number of equipment of the same category available for use

4.3.2.3 Borrowed Quantity: Total number and ID of equipment borrowed by teachers and students.

4.3.2.4 Out for Servicing: The number and details of equipment out of bound due to repair will be stored in the database.

4.3.2.5 Damaged: The number and details of the damaged equipment will be stored in order to know how many and which equipment are to be purchased.

4.4 Lab Courses

4.4.1 Lab Attendant

For each course, a lab attended will be appointed and will be added to that particular course.

4.4.2 Lab Manual

The lab manuals will be uploaded and updated for each course.

4.4.3 Time Table

The timetable of every course will be shown.

4.5 Log Book

4.5.1 Orders

Track of all the orders of the equipment to be purchased along with details about the price, delivery date, name of supplier and vendors.

4.5.2 Lending Details

Details about the type of equipment, equipment ID, borrower name, contact details, purpose of borrowing, date of borrowing and return date can be stored in the management system.

4.6 Prospective Producers

4.6.1 Suppliers

List of all the suppliers and the categories of the equipment supplied by them with contact and location details.

4.6.2 Vendors

List of all the vendors and the categories of the equipment supplied by them to the suppliers with contact and location details.

5. Non-functional Requirements

5.1 Performance Requirements

- The system should be lightweight and responsive.
- The system should be run properly in all browsers.

5.2 Security Requirements

- The user will need a user name and password for login to the system.
- Only admin will able to observe the logbook.
- The user will only able to view the availability of the equipment.
- Only the super admin will be able to assign the admin.

5.3 Software Quality Attributes

5.3.1 Maintainability

- Any update or bug fixes shall be able to be made on server-side computers only, without any patches required by the user.

5.3.2 Accuracy

- The system must contain the accurate information about the equipment present in the inventory.
- The system must contain authentic logbook and borrowed information.

5.3.3 Usability

- The users of the system should be able to interact with the system naturally.

5.3.4 Availability

- The user should be able to access the system on the office hour (except admin).
- If the system crashes it should be back up within a week.

5.3.5 Reliability

- The systems average time to failure is 15 days.
- If the server crashes, it will take a week to restart the system.

5.3.6 Quality

- The program should show the document that has been opened in less than 10 seconds of being clicked.
- While the user scrolls down, the program shouldn't show any scrolling jerks that last more than 200ms.

6. Other Requirements

Be susceptible to future changes of including more users, functionality and branches, along with the commercial prospect of marketing to future customers with similar requirements.

Appendix A: Glossary

A.1 Super Admin

A super administration is the user who has complete access to all the objects, folders, templates and groups in the system.

A.2 Admin

The administration of a website. Admin is assigned by a super admin.

A.3 Database

A database is information that is set up for easy access, management and updating.

A.4 User Interface

This refers to the interaction between user and the computer system. In particular, the user interface (UI) is the point of human-computer interaction and communication in a device.