A Mini Project Report on

Lab Infrastructure Billing System

S.E. - I.T Engineering

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CERTIFICATE

This to certify that the Mini Project report on **Lab Infrastructure Billing System** has been submitted by **Suraj Singh (20104032), Himanshu Rane (20104008)** and **Atharva Takle (20104022)** who are the students of **A. P. Shah Institute of Technology, Thane, Mumbai,** as a partial fulfilment of the requirement for the degree in Information Technology, during the academic year 2021-2022 in the satisfactory manner as per the curriculum laid down by University of Mumbai.

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Chapter 1

Introduction

Every College and school has laboratories where students can perform researches, experiments or even learn new things with the help of internet facility. Hence it becomes quite necessary to maintain detailed information about the infrastructure of these labs. Lab Infrastructure includes the equipment's, RAM, Switch Boards and computer systems etc. As these labs work on large scale, the detail records of their transactions needs to be maintained.

Maintain these records in any book or register manually is very tiring. One needs to go through a number of books or registers to view the details. A lab billing infrastructure system is an online desktop application which maintains the detail records of their Transactions. It enables the viewer to analyze the data anytime and anywhere

1.1Purpose

Lab infrastructure billing system is an executive information system (EIS) that determines the bill of each lab infrastructure. It provides an environment to maintain the bills of components used in lab. The purpose of Lab infrastructure billing system is to store the valuable data/information that can be stored for a longer period with easy accessing and manipulation of the same. Hence the required data becomes available anytime and anywhere as mentioned above. The purpose is to lead to error free, secure, reliable and fast billing system. Many new features are added which makes the process of data manipulation easy.

50% work of the user is reduced.

The application provides security to the data as only admin or the users allowed by the admin can modify the data. The bill of any component of the lab will be available within fractions of second. The total lab costing can be made available. The targeted audience are lab-workers

Lab-in-charge as well as school and college administrations.

Basically the project describes how to manage for good performance and better services for the clients.

1.2Objectives :

- To segregate lab category, year of purchase with their unique identification.

- To create a dashboard with department wise segregation of lab and total number of labs.

- To provide an interface for user to store scanned copy of bills in pdf format.

- To enable user to print bills and statistics.

1.3Scope:

- Can be applied in Labs, industries, Colleges, Schools etc.
  As Labs are an important part of educational institutions and industries. These labs work on a large Scale. So it becomes mandatory to maintain the records of the same. This Application makes it easier to maintain and retrieve data. This helps industries, colleges and Schools to keep track of the expenses in lab. This also helps them to fix an annual Budget of the lab.

- Useful for the Lab In charge, employees etc.
  Maintaining the records of these labs manually becomes very difficult for lab-In-Charge and Employees. There is a risk of loss of data or entry of the same data. Also it becomes a challenge for the lab-In-Charge and employees to store this data. Using this application prevents all these problems. Entering, Manipulating and modifying data becomes easy. This saves their time and effort.

Chapter 2

Problem Definition:

The old manual system was suffering from a series of drawbacks. Since whole of the system was to be maintained with hands the process of keeping, maintaining and retrieving the information was very tedious and lengthy. The records were never used to be in a systematic order. There used to be lots of difficulties in associating any particular transaction with a particular context. If any information was to be found it was required to go through the different registers, documents there would never exist anything like report generation. There would always be unnecessary consumption of time while entering records and retrieving records. One more problem was that it was very difficult to find errors while entering the records. Once the records were entered it was very difficult to update these records. The reason behind it is that there is lot of information to be maintained and have to be kept in mind while running the business .For this reason we have provided features Present system is partially automated (computerized), actually existing system is quite laborious as one has to enter same information at three different places.

Chapter 3

3.1 Proposed System

The aim of the project is to develop a lab infrastructure billing system which maintains proper records of lab infrastructure, where one can upload bills as the proofs of transactions as well as total lab cost is available. The proposed system can overcome all the limitations and errors of the manually maintained records. The system provides proper security and reduces the manual work.

- Security of data.
- Ensure data accuracy's.
- Proper control of the Admin
- Greater efficiency.
- Minimum time required.
- Better service
- More Advanced features

3.2 Features and Functionality:

1. **Sign in/ Sign up/ Forget password:**

- Sign in and Sign up helps user to register and login themselves
- This gives a security to the user by preventing unauthorized actions
- This protects the data
- If user Forget password they able to change password.

2. **Dashboard:**

- Combo boxes are added in the dashboard which makes it easier for the user to select the lab, department and year through which they can view or edit the data according to their convince.
- A User can able to upload the bills of the purchase components with their details and later the user can able to print uploaded bills.
- All the information of the transactions is available in the form of table.
- The data in the table can be manipulated according to the user convince.

3. **Profile:**

    - A user can access his/her profile and activities.
    - It provides the detail information of the user.
    - User can change his password in this profile section.
    - Also User can change their password on their will.

4. **Upload:**

    - User is able to upload the bills which gives the clarity of the transactions.
    - The bills are uploaded in pdfs which are easy to download.
    - If the original bill is lost its soft copy remains preserved.

Chapter 4

Project Outcomes:

- User can able to login & Signup if in case user forget their password then they can change their password too.

- User will bale to access their profile page.

- User can able to maintain the records of bills of their Lab infrastructure.

- Price of every component purchased in different years are available with their scanned copy of bills in pdf format.

- The uploaded bills can be printed later when they are required.

- Only Registered Users can view or edit the data. Thus providing protection to the data.

- Editing, adding and updating of Records by the user

- It deals with monitoring the information and transactions of labs.

- It tracks all the information of the transactions done.

- To increase efficiency of the application.

Chapter 5

Software Stack:

- **Development Eclipse IDE 2021-09 (4.21.0)**

  Eclipse is an integrated development environment (IDE) used in computer programming. It contains a base workspace and an extensible plug-in system for customizing the environment. Eclipse is written mostly in Java and its primary use is for developing Java applications. Eclipse software development kit (SDK) is free and open-source software, released under the terms of the Eclipse Public License, although it is incompatible with the GNU General Public License.

- **Frontend: JAVA Swing**

  Swing is a GUI widget toolkit for Java.[1] It is part of Oracle's Java Foundation Classes (JFC) – an API for providing a graphical user interface (GUI) for Java programs. Swing was developed to provide a more sophisticated set of GUI components than the earlier Abstract Window Toolkit (AWT). Swing provides a look and feel that emulates the look and feel of several platforms, and also supports a pluggable look and feel that allows applications to have a look and feel unrelated to the underlying platform. It has more powerful and flexible components than AWT. In addition to familiar components such as buttons, check boxes and labels, Swing provides several advanced components such as tabbed panel, scroll panes, trees, tables, and lists.

- **Backend: Postgresql 12.9-111**

  PostgreSQL also known as Postgres, is a free and open-source relational database management system (RDBMS) emphasizing extensibility and SQL compliance. It was originally named POSTGRES, referring to its origins as a successor to the Ingres database developed at the University of California, Berkeley. In 1996, the project was renamed to PostgreSQL to reflect its support for SQL. After a review in 2007, the development team decided to keep the name PostgreSQL and the alias Postgres. PostgreSQL features transactions with Atomicity, Consistency, Isolation, Durability (ACID) properties, automatically updatable views, materialized views, triggers, foreign keys, and stored procedures. It is designed to handle a range of workloads, from single machines to data warehouses or Web services with many concurrent users. It is the default database for macOS Server and is also available for Windows, Linux, FreeBSD, and OpenBSD.

Chapter 6

Project Design:

In this phase, a logical system is built which fulfils the given requirements. Design phase of software development deals with transforming the client's requirements into a logically working system. Normally, design is performed in the following in the following two steps:

1. Primary Design Phase: In this phase, the system is designed at block level. The blocks are created on the basis of analysis done in the problem identification phase. Different blocks are created for different functions emphasis is put on minimizing the information flow between blocks. Thus, all activities which require more interaction are kept in one block.

2. Secondary Design Phase: In the secondary phase the detailed design of every block is performed.

The general tasks involved in the design process are the following:

1. Design various blocks for overall system processes.

2. Design smaller, compact and workable modules in each block.

3. Design various database structures.

4. Specify details of programs to achieve desired functionality.

5. Design the form of inputs, and outputs of the system.

6. Perform documentation of the design.

User Interface Design: User Interface Design is concerned with the dialogue between a user and the computer. It is concerned with everything from starting the system or logging into the system to the eventually presentation of desired inputs and outputs. The overall flow of screens and messages is called a dialogue.

The following steps are various guidelines for User Interface Design:

1. The system user should always be aware of what to do next.

2. The screen should be formatted so that various types of information, instructions and messages always appear in the same general display area.

3. Message, instructions or information should be displayed long enough to allow the system user to read them.

4. Use display attributes sparingly.

5. Default values for fields and answers to be entered by the user should be specified.

6. A user should not be allowed to proceed without correcting an error.

7. The system user should never get an operating system message or fatal error.

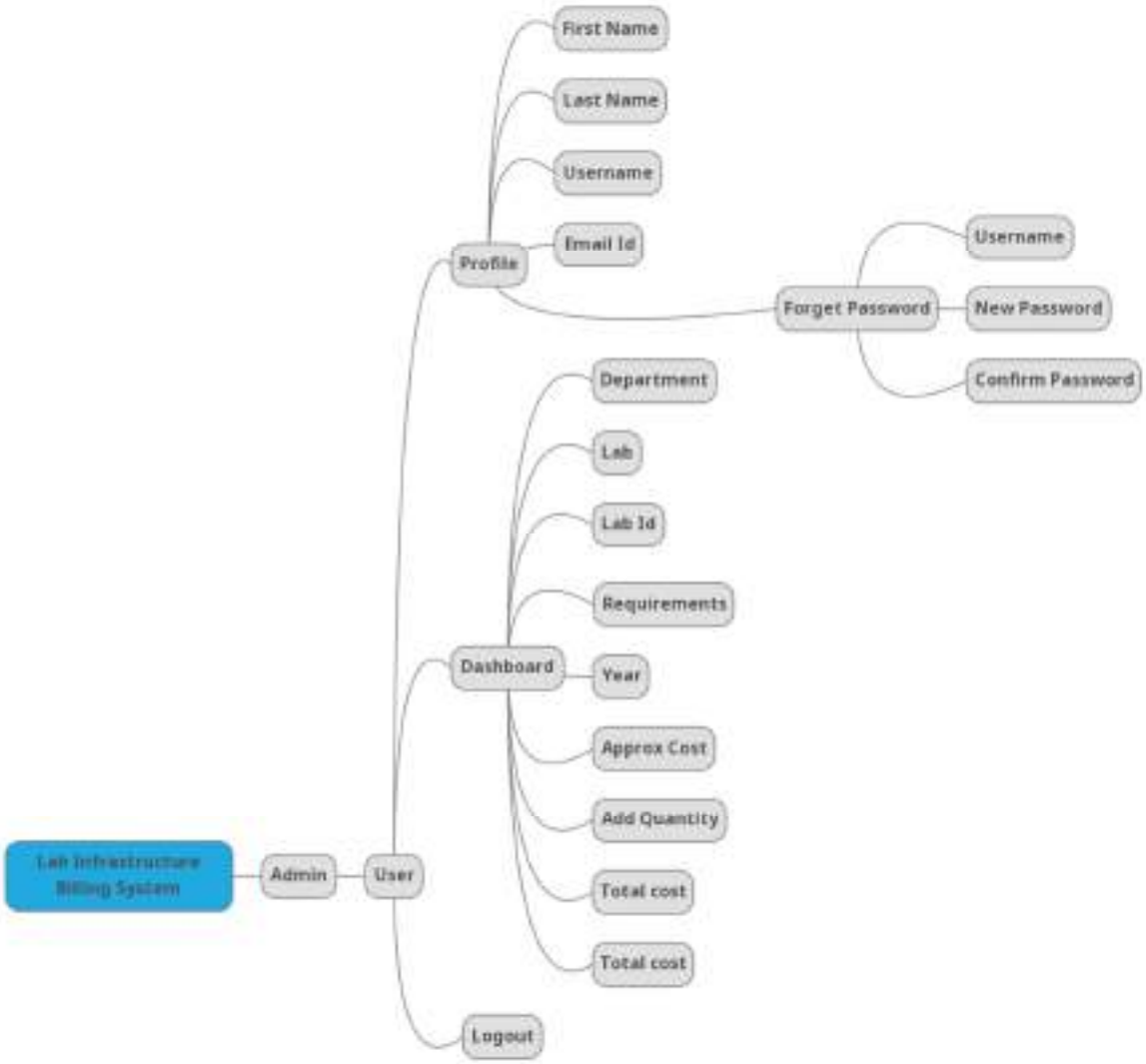

Figure 6.1: Flowchart

Chapter 7

Database Design

7.1 ER Model

A database management system (or DBMS) is essentially nothing more than a computerized data-keeping system. Users of the system are given facilities to perform several kinds of operations on such a system for either manipulation of the data in the database or the management of the database structure itself. E-R model stands for an Entity-Relationship model. It is a high-level data model. · It develops a conceptual design for the database. It also develops a very. The Below E-R Model is the representation of lab Infrastructure Billing System. The E-R Model starts with Strong entity Admin with Attributes Superclass, Username and Password. The Admin gives permission to User. User is the next strong entity with attributes Signup, Password and User Id. User is a Dashboard or Profile. Dashboard and Profile both are Strong Entities. Profile has two Attributes Name and email Id. Dashboard has attributes Department name, Unique Id, Lab Name and Academic Year. It also has a Multi-Valued Attribute components which contains of attributes Component Name, Cost, Total Cost and Bills.

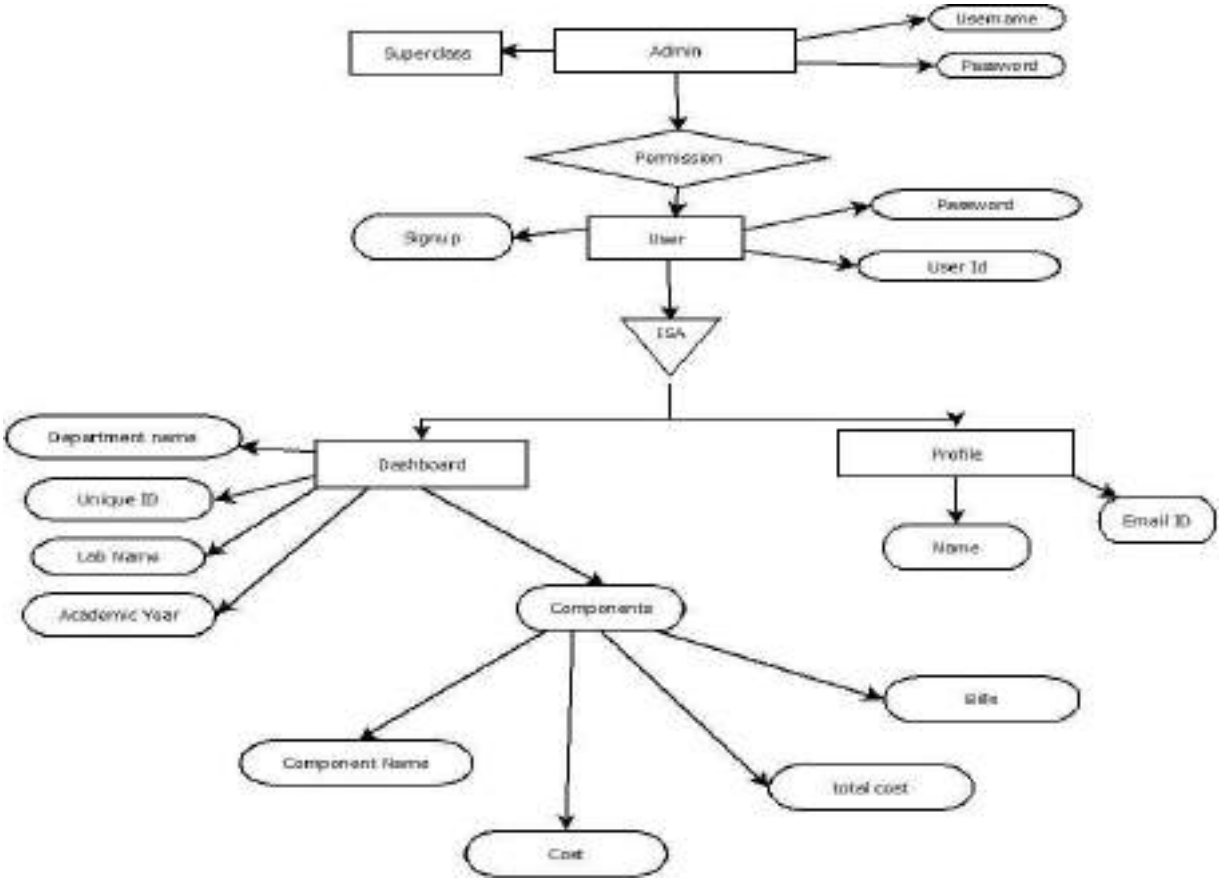

Figure 7.1: ER model

Chapter 8

Implementation:

The following is the implementation of the project:

Figure 8.1 Login Page

Authorized Users can use the Application through the login page by using their Username and password.

Figure 8.2 Signup Page

Users can get themselves enroll themselves in the Application by adding their details and thus get registered.

Figure 8.3 Forgot Password Page

Through this page if user doesn't remember their password they can change using their Email Id.

Figure 8.4 Homepage

This the Homepage of the application with four options namely Profile, Dashboard, view and logout.

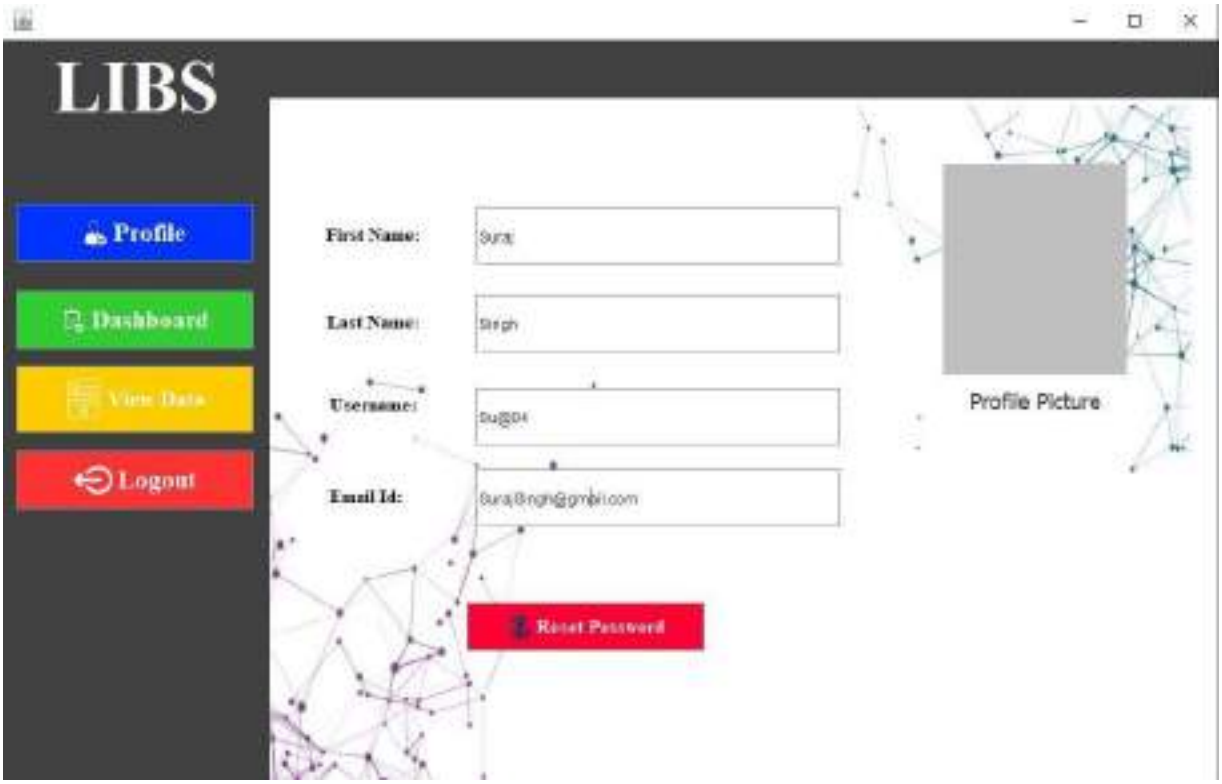

Figure 8.5 Profile Page

This is the Profile Page of the application with detailed information of the user and Reset Password Option.

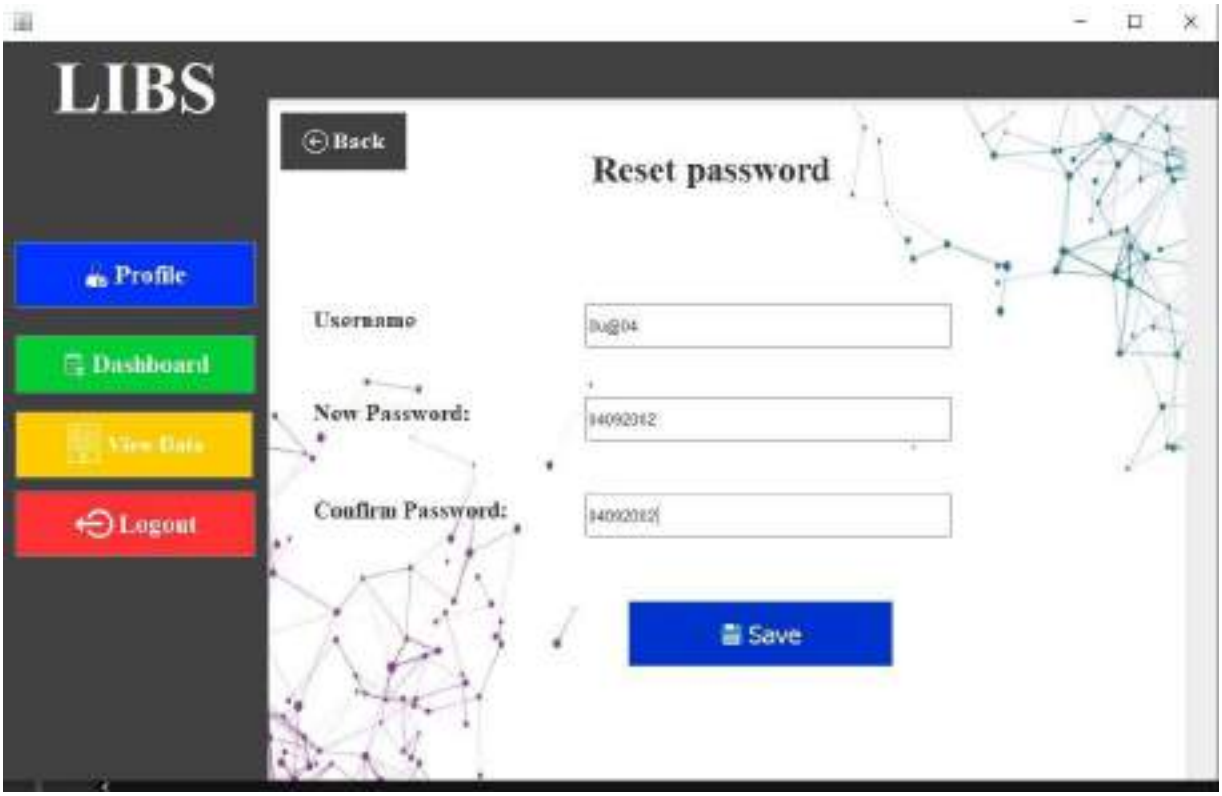

Figure 8.6 Reset Password Option

In case the user forgot his password, he/she can set a new Password.

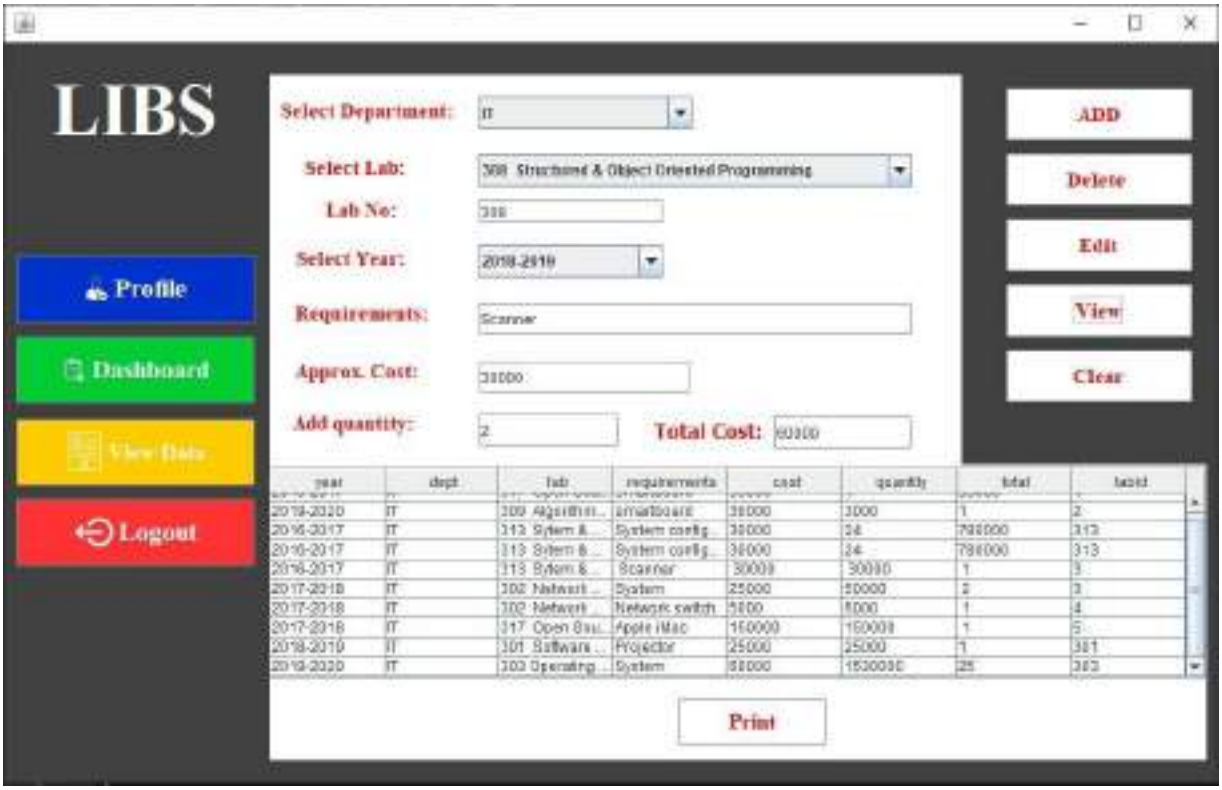

Figure 8.6 Dashboard

The user can add, delete, edit or view data through this page. For this, the users have to select Department, lab, lab No, Select Year, Requirements, Approx. Cost, quantity and Total Cost.

Figure 8.7 Print Option

The user can print any data wanted as per His / Her convience to maintain Hard copies of the data

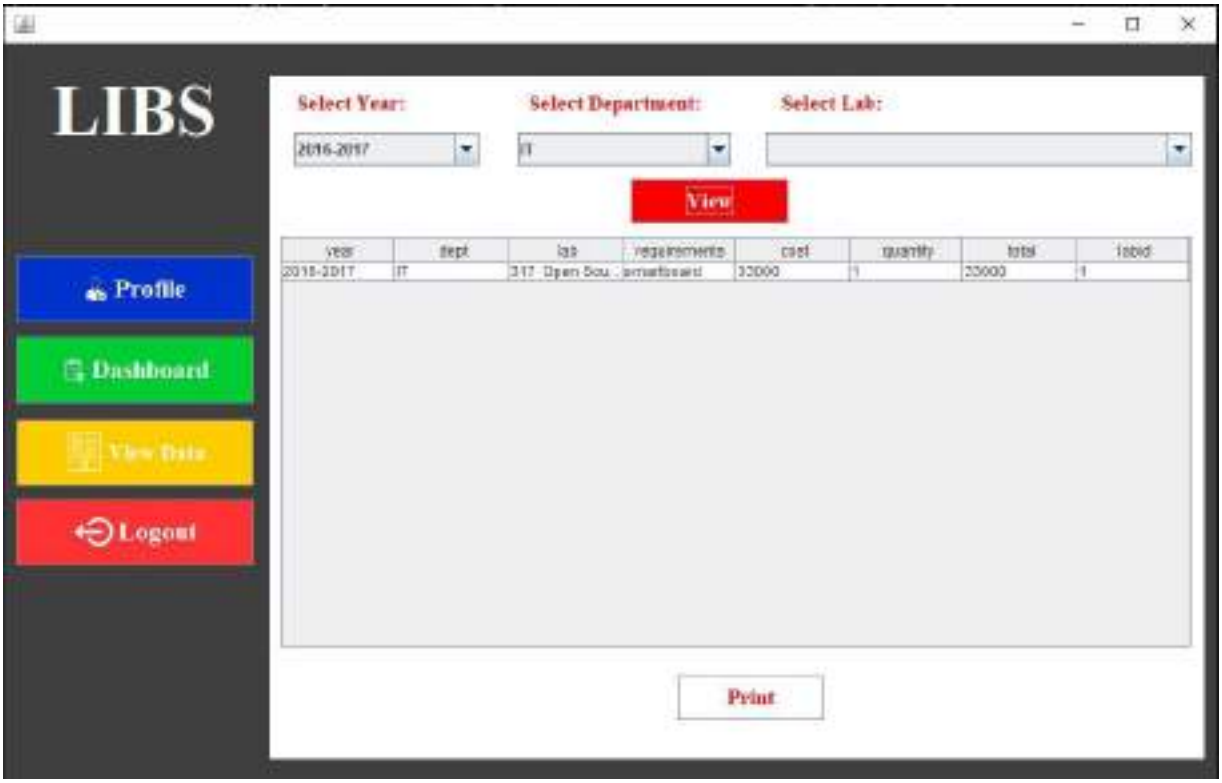

Figure 8.8 View data Page

The user can view the data of all labs through this page and can take print as well.

Chapter 9

Project Scheduling

Sr. No	Group Member	Time duration	Work to be done
1	Suraj Singh	1st week of January	Implementing GUI with database for signup, login, forgot password and Mainframe.
		2nd week of January	Testing GUI with database for signup, login, forgot password and Mainframe.
2	Suraj Singh, Himanshu Rane, Atharva Takle	3rd week of January	Implementing GUI Profile frame and reset frame with database.
3	Atharva Takle, Suraj Singh, Himanshu Rane	By the end of march month	GUI With database for Dashboard

Chapter 10

Conclusion

Our project is only a humble venture to satisfy the needs of the user. Several user friendly techniques like Drop down boxes, Reset password Option, print Option and many more features are added. The objective of the project is to propose a system that will record and maintain data of the Lab Infrastructure. This reduces the burden of lab employees as they don't have to spend time on maintaining and then storing the data. This reduces their effort and saves time.

Manually maintained and stored data has many faults like repetition of same data, entering wrong data or sometimes loss of data. In our project, we have overcome these problems and lead to an errorless system. Also if one has to view data, He / She has to go through a number of registers or books. In our Project we have solved this issue by adding View Option. In future work we are trying to add security features for the same.

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