PARSHVANATH CHARITABLE TRUST'S

A.P. Shah Institute of Technology

Thane, 400615

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Department of Computer Engineering

CSL605 SKILL BASED LAB COURSE: CLOUD COMPUTING

Mini Project Report

Title of Project : **Lab Management System**

- **Year and Semester** : **T.E. (Sem VI)**
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Chapter 1

Abstract

"Lab Management System" is a smart online website with a simple-looking interface designed to reduce manual work and automate things with just a few clicks.

The college laboratory management system is a web-based application that aims to manage laboratory equipment in junior colleges. This system utilizes technology to store and manage equipment details, maintenance records, and updates on a weekly basis. The website serves as a central repository for laboratory equipment information, allowing faculty and staff to easily access and update records. With this system, junior colleges can track equipment usage, maintenance schedules, and inventory levels, ensuring that the laboratory equipment is in good condition and ready for use. Additionally, the system provides real-time information, reducing the risk of equipment breakdown and optimizing laboratory operations. Overall, the college laboratory management system is a valuable tool for improving laboratory management and enhancing the learning experience for students.

Chapter 2

Introduction

In today's fast-paced world, laboratories are facing increased pressure to improve efficiency, productivity, and accuracy in their daily operations. The Lab Management System (LMS) is a software platform designed to streamline laboratory activities, automate processes, and provide a centralized platform for managing laboratory operations.

The Lab Management System is a comprehensive solution that provides a range of features and functionalities to help laboratories manage their activities efficiently. The system includes tools for scheduling experiments, tracking inventory, maintaining equipment, and recording experimental data. It also includes features for generating reports, sharing data, and collaborating with other members of the laboratory.

The Lab Management System is designed to be user-friendly, intuitive, and accessible from anywhere with an internet connection. The system is typically cloud-based, allowing laboratory members to access it from anywhere, at any time. This makes it easy for lab administrators to manage laboratory activities and for technicians to carry out experiments and record data.

One of the key features of the Lab Management System is equipment and supply management. The system allows lab administrators to track the availability and usage of equipment and supplies, schedule maintenance tasks, and reorder supplies as needed. This helps to prevent equipment downtime, reduce waste, and improve the overall efficiency of the laboratory.

Another important feature of the Lab Management System is the experiment schedule. The system allows lab administrators to schedule experiments, assign resources, and track progress in real-time. This helps to ensure that experiments are carried out efficiently and that resources are used effectively.

In addition to these features, the Lab Management System also includes tools for recording experimental data, generating reports, and sharing data with other members of the laboratory. The system allows users to record data in real time, reducing the risk of errors and improving the accuracy of experimental data. It also includes features for generating custom reports and graphs, making it easy to analyze and share data with others in the laboratory.

Overall, the Lab Management System is an essential tool for laboratories looking to improve efficiency, accuracy, and productivity. The system provides a comprehensive solution for managing laboratory operations, automating processes, and streamlining workflows. With the growing demand for high-quality research, an LMS is becoming increasingly important for laboratories looking to stay competitive and achieve their research goals.

Chapter 3

Problem Definition

In any laboratory managing different activities such as scheduling experiments, tracking inventory, maintaining equipment, and recording experiment results can be a daunting task. Manual methods of record-keeping and management can be time-consuming, error-prone, and inefficient. Therefore, there is a need for a Lab Management System (LMS) that can automate these tasks and streamline the lab's operations.

The Lab Management System aims to provide a centralized platform that can manage all the activities in a laboratory efficiently. The system should allow lab administrators to manage equipment and supplies, schedule experiments, record experimental data, and generate reports easily. Moreover, it should also allow lab technicians to check equipment availability, schedule experiments, and record experimental data.

The Lab Management System should be user-friendly, intuitive, and accessible from anywhere with an internet connection. It should also be secure, reliable, and scalable to accommodate the growing needs of the laboratory.

The Lab Management System will provide the following benefits:

1. Efficient and accurate record-keeping of experimental data
2. Streamlined equipment and supply management
3. Improved scheduling of experiments
4. Faster and more accurate generation of reports
5. Reduced manual effort and errors
6. Better collaboration between lab technicians and administrators

Chapter 4

Objective and Scope

The College Laboratory Management System is designed with the main objective of keeping the laboratory equipment updated and well-maintained. This system maintains systematic data of all the lab equipment available in the college, ensuring that each student has access to lab equipment that is in good working condition. The system is designed to avoid the hectic job of a representative who would otherwise have to manage the equipment and ensure its upkeep.

By using this system, lab personnel can deliver their assigned duties within a limited time and resources. The system ensures that the lab conditions and personnel are up to contemporary standards, which in turn guarantees that the quality of education is not compromised. Overall, the College Laboratory Management System plays a vital role in ensuring that the laboratory equipment in the college is in good condition, thereby providing students with a conducive environment to learn and conduct experiments.

The College Laboratory Management System is highly effective in running a lab as it provides a comprehensive digital inventory of all the lab equipment. The system allows lab personnel to easily update records and retrieve data, which is essential for running a laboratory efficiently. The system also includes expiry management functionality, which allows lab personnel to manage their inventory efficiently by keeping track of expiry dates and making the best choices about stock rotation, reducing wastage and saving time. Overall, the College Laboratory Management System is a powerful tool that can significantly improve the effectiveness and efficiency of laboratory operations.

Chapter 5

Description About AWS Services Used

Cloud Services used in this project are as follows:

1. AWS Elastic Compute Cloud -

EC2 is a cloud-based computing service provided by Amazon Web Services (AWS) that allows users to create and run virtual servers, known as instances, in the cloud. It provides a scalable, flexible, and cost-effective way to host applications and services. Users can choose from a variety of instance types, optimized for different use cases, and launch instances in a matter of minutes. EC2 also provides a range of security features to ensure the protection of user data.

2. AWS Security Groups –

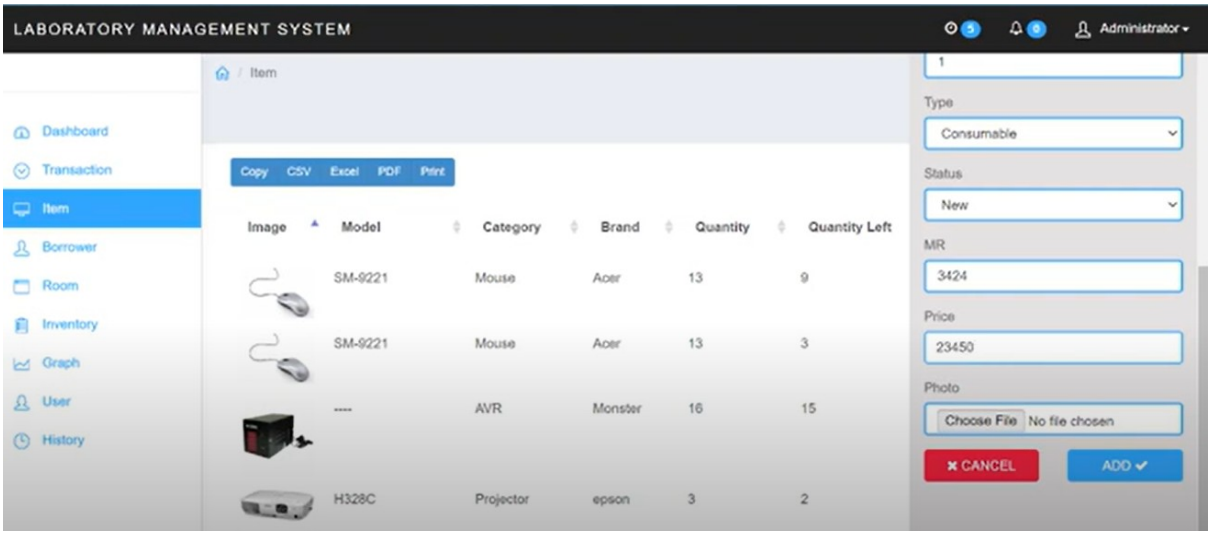
AWS Security Groups are a cloud-based service provided by Amazon Web Services (AWS) that act as virtual firewalls for EC2 instances. They control inbound and outbound traffic to and from the instance, providing an additional layer of security. Security Groups operate at the instance level, allowing users to apply different rules to different instances. They use stateful traffic filtering, which means that responses to outbound traffic are allowed, regardless of the inbound rules. Overall, AWS Security Groups provide a flexible and scalable way to manage network security in the cloud.

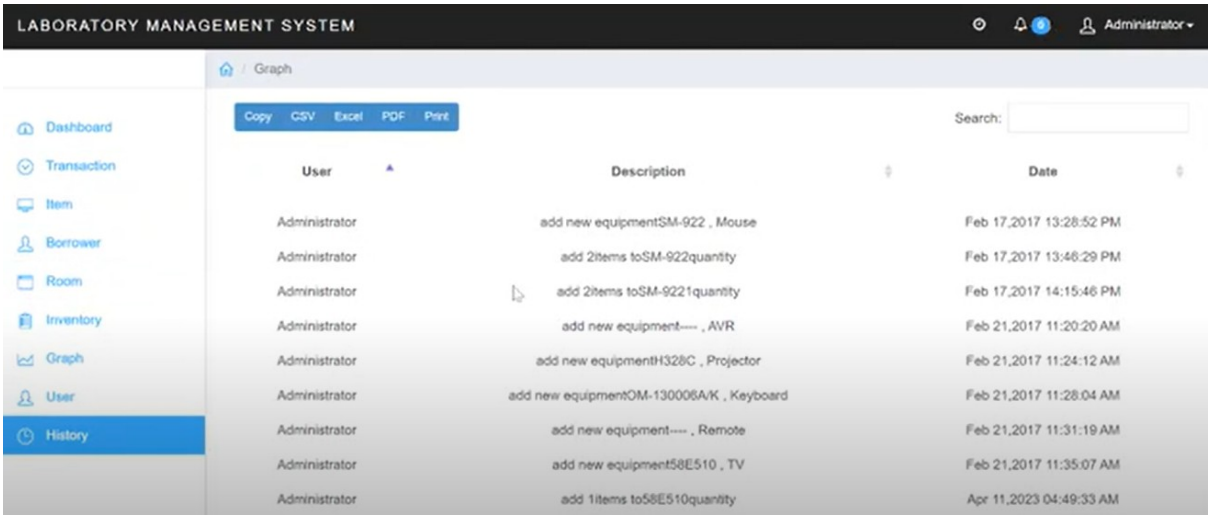
3. AWS VPC -

With AWS VPC, users can create and manage a virtual network topology that closely resembles a traditional on-premises network infrastructure. Users can define and control network addressing, subnets, and routing tables, as well as configure network gateways, security groups, and network access control lists (ACLs).

Chapter 6

Implementation





Chapter 7

Learning Outcome

The Lab Management System project hosted on AWS EC2 instances and security groups requires a strong understanding of cloud computing and web development concepts. By working on this project, users can learn how to set up and manage EC2 instances, security groups, and other AWS services. They can also gain experience in developing web applications using PHP and MySQL and deploying them on a cloud-based platform.

Users can develop their skills in designing and implementing secure web applications by incorporating security measures such as user authentication and role-based access control. They can also learn how to optimize application performance by selecting the appropriate instance types for specific use cases.

Overall, the Lab Management System project can help users to develop a comprehensive understanding of cloud computing, web development, and security concepts and gain practical experience in deploying web applications on the cloud.