Supervise Student's Activity Through Lab Monitoring System

Sakharam Rawool[1], Srijan Singh[2], Ashish Janganor[3], Katkar Sunil N[4]

[1, 2, 3, 4] Department of Computer Engineering

[1, 2, 3, 4] Vidyavardhini College of Engineering, Vasai, Maharashtra, India

Abstract- *Lab monitoring is becoming an important aspect for colleges or universities nowadays. This is a system that will be developed to enhance the management system for computer labs. The purpose of these development included in this project is to replace the original management system with a computerized system. Currently, teachers are, required to check each and every student's computer manually and maintain a special record book for students using the computer with their name, roll number, class, etc. and maintaining this data for long period is a hectic job. However, the proposed system will make teachers able to hook lab through an application. Here, we maintain the record of each and every student using the computer during the lab sessions. These data will be stored in a database where it will be viewed by the administrator or server machine[2]. We also provide the continuous monitoring of the students' computer to administrator or server machine throughout the lab sessions and maintaining the log report of the actions performed by the students' during each lab sessions.*

I. INTRODUCTION

Subjects that require use of computers generally rely on conducting related class exercises and lab sessions for appropriate discussion of concepts. Properly supervised and conducted lab work can greatly increase the efficiency of teaching. Most knowledge processing machine related subjects have to do with testing building meeting. Teaching in computer science labs is not easy and requires a lot of preparation and supervision. In addition to that the layout of the labs is mostly such that the lab conductor is unable to see students' monitors and because of this, cannot test evaluate their progress of the taught material. The experience in computer labs can be improved dramatically for students and teachers equally, if proper supervision and monitoring tools are available.

- Lab Monitoring System is a LAN based application specially developed for improving the effectiveness of lab sessions. This application can be used in any subject but is designed while considering computer science subjects. It facilitates supervision and control of computer labs by providing means suitable for enhanced learning experience.

- Lab Monitoring System provides effective student-teacher interaction, supervision of entire lab through client-server module of the application and remotely controlling the students' computer to stay focused during Lab sessions.

- Lab Monitoring System provides a set of standard features which are generally provided by most commercially available systems designed for the purpose of lab management. The set of these features provide ease in management and monitoring of lab sessions. Some of those basic features are; file sharing, desktop monitoring, log report generation etc.
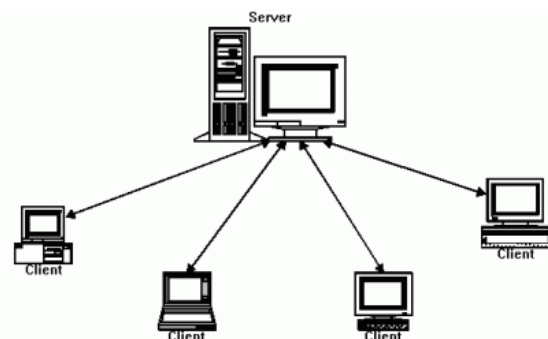

Figure 1. Client-Server Module of Application

Lab-monitoring is a LAN predicated infuses application specially developed for ameliorating the efficacy of lab sessions. This application can be utilized in any subject but is designed while considering computer subjects. It facilitates supervision and control of computer labs by providing denotes opportune for enhanced classroom learning and interaction. This application provides denotes to ameliorate:

- Teaching: maximum student-teacher interaction is provided as the teacher can show the edification and lab exercises on the screen. The students can additionally exchange files by sending them to the teacher or to each other, any of this can be blocked as well.

- Supervision: teacher can monitor students' screens while sitting on his/her own computer. Off track students can be

availed immediately which can preserve a lot of time and effort.

• Lab Control: teacher can remotely control students' computers to keep students focused. Possible options are: sending expeditious message, log off and shut down the system.

Lab-monitoring provides a set of standard features which are generally provided by most commercially available systems designed for the purport of classroom management. The set of these features provide ease in management and monitoring of classroom exercises and lab sessions. Some of those rudimentary features are; file sharing, desktop monitoring, timer facilities, and text chat etc.[1]

II. LITERATURE SURVEY

[1] Smart Lab: LAN Based Application for Effective Lab Supervision.

This literature proved very helpful, many modules can be inherited and overridden in proposed system for efficient output. It provides the related system which focuses on lab supervision and provides an interface to teachers in computer lab to handle the class and monitor students by providing live streaming of activities running on each student's computer. It also provides a platform to exchange files and messages between teacher and student's computer. Student's attention can be grab by showing a blank screen, this gave a new idea to teach and supervise students properly.[1]

[2] Study and Application of Key Technologies of LAN Remote Control.

This literature presents an intelligent, real-time controlling management system which again acts as a related system to the proposed system. In this literature, remote controlling of the computers in LAN is improved using an intelligent, real-time controlling management system. The system proposed by this literature will provide screenshots of computers connected in LAN, it will also allow locking of mouse and keyboard and screen-darkening. Addition to this shutting down of computers is also allowed by remote controlling. All this functioning is achieve using Socket network communication and API programming, along with the Trojan horse technology. Using Trojan technology, it has become easier to instruct machine for performing particular function as it allows defining function codes for request message so whenever any function is requested it is first sent through socket programming and then the function code is fetched, then according to the request, response from the client machine can be retrieve. All this functions are based on

machine specific commands which benefits into getting immediate response and also to get wide flexibility to interact with the system by using system calls.[2]

[3]Design and Implementation of a Remote Screen Monitoring System Based on java.

As screen monitoring acts as a major module of the proposed system, this literature proved very helpful in supplying the entire knowledge of java API's which are required to implement screen monitoring module. This literature have completely explained the process of screen monitoring where server machine requires to capture screen resolution of client machine which is provided by the classes in the AWT package of java. Process starts from taking screenshots of client machine stored in the Image stream of buffer which is transfer to server which serves the live streaming of client machine. The images in the buffer are first compressed using JPEG compression provided by java API, these compressed images are transferred through the LAN network using UDP protocol supported by java, at the server side these images are decoded and then transferred. In this way screen monitoring is achieved using java, In addition to this, it also uses Robot class of java to perform remote interaction. Methods of Robot class allow performing event handling on remote system. Keyboard and Mouse Events are handled to performed task on the remote system.[3]

[4]LAN Chat Messenger (LCM) using Java Pro0gramming with VOIP.

This literature proved helpful to get idea of implementing instant sharing of files and messages over LAN. The literature, LAN Chat Messenger (LCM) using Voice Over Internet Protocol offers zero communication cost which involves sharing of text messages, files and voice messages over IP. LCM is a standalone application developed using JAVA programming language implementing client/server communication using TCP/IP. Socket programming used offer smoother and fast sharing of messages over the LAN as the transfer occur on machine specific static IP address and Port number thus allowing to establish faster connection between sender and receiver. This literature proved very helpful for the proposed system to get the methodology of sharing text messages and files very smoothly over the LAN.[4]

III. PROPOSED SYSTEM

The design of our system is difficult to put clearly on paper as it includes a lot of modules. We have endeavored to show system design in the following figures while listing

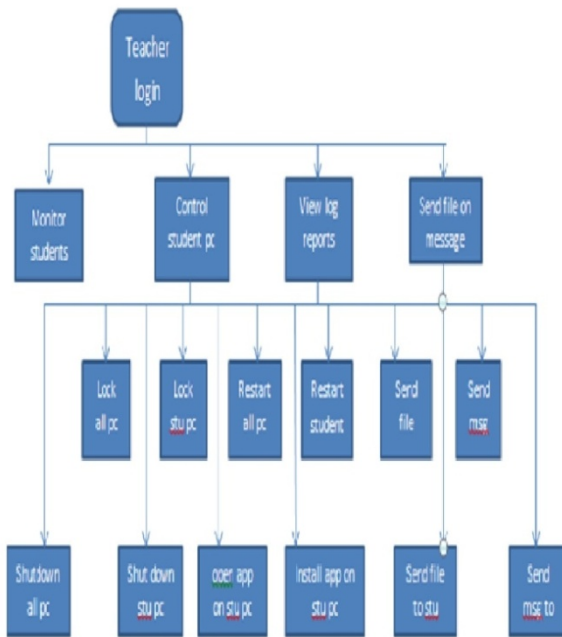minimum amount of required details, in order to keep it simple and readable for others.

Figure 2. System Block Diagram (Server Side)

Figure 2 show the server side design of the program running on teacher's computer.This system is utilized for supervising all other client programs running on students' computers.Firstly, all available options are shown which teacher can utilize according to the requisite. The figure shows that the edifier needs to enter the authenticate to access the system. After that the system presents all the available operations in single form.[3] Among those edifier can select whatever he or she wants to do according to the need. The available operations are,

- Monitor screen: to check what students are doing?
- Present lesson: start same edification on all computers.
- Use student PC: use student's computer to show some edification or exercise.
- Blank screen: blank student's monitor screen.
- Shutdown/restart PC: to start or shut down some or all computers in the lab for facile administration.
- Block sites: to stop students from accessing some or all websites on the Interne.
- Send file: to commence file exchange.
- Send message: to commence message exchange.
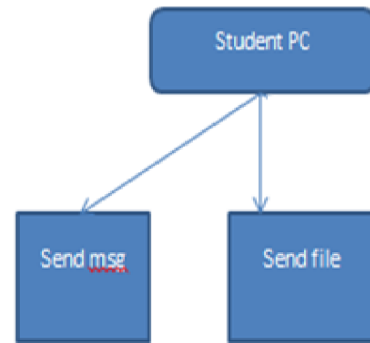- Chatting: to commence chatting.

Figure 3. System Block Diagram (Client Side)

Figure 3 shows modules and interactions of comparatively simpler client side design of the program running on each student's computer.[4] A subset of the features provided by the application is available to the students, which are;

- Send File: to commence file exchange.
- Chat: to commence chatting.
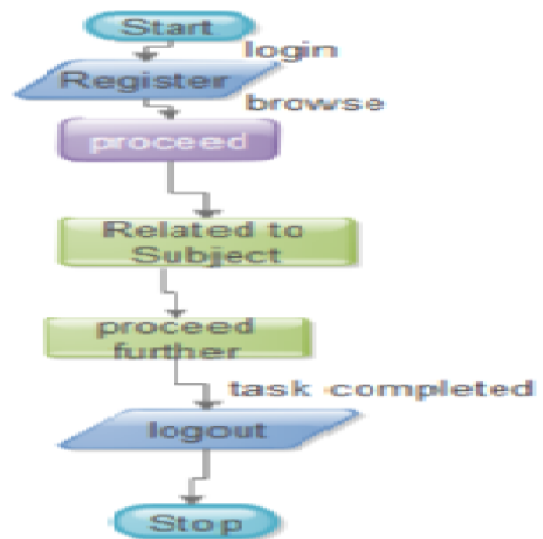- Send message: to commence message exchange.

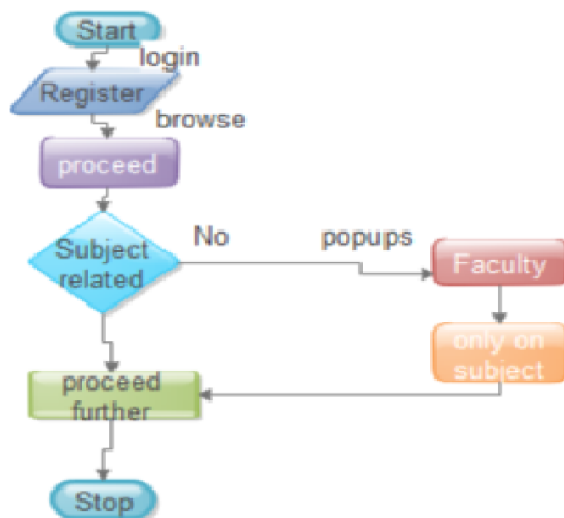
Figure 4. Data Flow (Client Side)

Figure 5. Data Flow (Server Side)

IV. MODULE DESCRIPTION

This system software is designed while considering requirements of the teachers and students during lab sessions. We have tried to include a number of useful features to facilitate and improve lab conducting experience.[5] It is important to point out that even though our application provides a large set of features but these can be customized for example, if teacher does not want to allow students to chat with each other then the related feature can be disabled. Overall software provides following Modules;

A. File Exchange:

Teacher and students can send and receive files to single, multiple or all users. Text and audio messages can be exchanged between all users.

B. Screen Monitoring

Teacher can see the monitor screen of any student to check what he or she is doing at that time. This gives monitoring control to the teacher to keep track of students' activities.

C. Shut down or restart computers

It takes a lot of time to turn on or turn off every computer in the lab manually at the beginning and end of every class. Smart-Lab gives an option that with a few mouse clicks teacher can shutdown or restart an entire lab simultaneously.

D. USB attached and detached detection

The teacher gets popup notification if any student attached or detached any device on respective pc.

E Chatting

Students can also do text chat with the teacher.
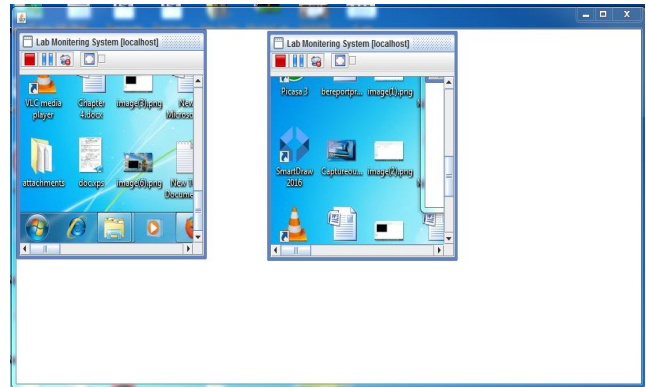
V. RESULT

Figure 6. Screen Monitoring

VI. CONCLUSION

In this project, we have design a Lab monitoring system. It is an application designed for proper supervision and monitoring of labs. Our application provides a large number of features essential for proper management of classrooms. The work on this project has helped the team in great way in exploring the various ideas we came across which will help us in future for the implementation of our project. This project has met its objective to provide the efficient monitoring of the computers in the lab. We are developing this project using "JAVA" programming language for effective understanding of the project. We are also using MySQL server for storing the data.

VII. ACKNOWLEDGMENT

Our thanks to our college VCET and our department of Computer Engineering which have extended all their support and necessary requirements which we have needed to complete our project. I extend my immense gratitude to my guide, Prof. Sunil N. Katkar who supported us throughout with their patience and knowledge.

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