

MULTI-USER CHAT SYSTEM

**Submitted in partial fulfillment of the requirements for the Degree of Bachelor of Science in Information Technology (BSc.IT) at Maseno University**

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# Declaration

We declare that this work has not been previously submitted and approved for the award of a degree by this or any other University. To the best of our knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made in the thesis itself.

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***ABSTRACT***

Currently, the existing technology requires Internet connectivity to enable you to chat with friends in a particular room.

The use of Multi User Chat System application enables friends to chat in the network area (LAN) by using *intranet* *mailing*. The Intranet Mailing System is applicable within an organization only. The organization has shift times and it becomes difficult for an employee of one shift to communicate to an employee of another shift. If the organization has an Intranet Mailing System (IMS) facility available to all its employees then each employee can register himself/herself and send mails to any other registered employee. This makes communication easier. This will work under any operating system.

To establish a communication between the systems, we need simple socket connections in order to connect them in a network.

* Socket programming uses the client socket and server socket methods to connect the local host to the named host and port.
* The communication between various users is done using server client model.
* Several client machines are connected to their dedicated server ports and communication is established.
* We use the lowest level of networking techniques available in java, though there are many ways of connecting client with the server.
* Hence, we need simple classes of networking package in order to establish a server client prototype.

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**Chapter 1: Introduction**

* 1. ***Background***

In web2.0 era communication between registered users are common activity. Users who register for community expect more and more attractive functionality to register with website. In this multi-user application user can chat with other logged-in user privately, publicly (group chat) and can share files and can archive chat messages and retrieve whenever he need to check chat history.

There are many well known multi-user chat application are available in the internet. G-talk (Google), Yahoo messenger (yahoo) and MSN or live (Microsoft) are widely used chat applications. These chat applications provide users, other than chat facility, many other attractive options.

We are planning to develop multi-user chat application similar to other well known chat application, only difference in this mult-user chat application is, If this is deployed on any corporate, only employees within the same corporate can chat with other employees. If the application is deployed on any education institute only same education institute professors and students can communicate with other students or professors.

**1.2 Problem Statement**

Currently, the existing technology requires Internet connectivity to enable you to chat with friends in a particular room.

**1.3 Project Objectives**

The use of Multi User Chat System application enables friends to chat in the network area (LAN) by using *intranet* *mailing*. The Intranet Mailing System is applicable within an organization only. The organization has shift times and it becomes difficult for an employee of one shift to communicate to an employee of another shift. If the organization has an Intranet Mailing System (IMS) facility available to all its employees then each employee can register himself/herself and send mails to any other registered employee. This makes communication easier. This will work under any operating system.

**1.4 Justification for doing the Project**

The aim of this project is to develop desktop chat application incorporated with java multi-threaded client-server program which would allow users to communicated private and public way and share resources while chatting and archive communicated messages.

This report is to use java, swing, multi-threading and TCP-IP technology to design and create desktop based multi-user chat application design for chat and communicated over intranet.

The methodology for this report is to understand how to carry out research into multi-user chat application, resource sharing while communicating through the Internet. Also finding out how users would feel. Interviews and research would be ongoing before starting the actual designing to identify the key elements of the project.

**1.5 Scope and Limitations**

Communication over a network is one field where this tool finds wide ranging application. Multi User Chat application establishes a connection between 2 or more systems connected over an intra-net. This tool can be used for large scale communication in an organization or campus of vast size, thus increasing the standard of co-operation. In addition it converts the complex concept of sockets to a user friendly environment. This software can has further potentials, such as file transfer, voice chatting and conferencing options that can be worked upon later.

**Chapter 2 : Literature Review**

**2.1 Introduction**

This an account of what has been published on a topic. The aim of a thisis to show your reader that you have read, and have a good grasp of, the main published work concerning a particular topic or question in your field.

**2.1.1 Normal chat systems Defined**

One of the major challenges with normal chat systems is secure communication between the users. The corporate or scientific organization may have information which need be protected with intruders or hacker. The chat system should implemented such a way that the information

**2.1.2 The normal chat systems Challenge**

One of the major challenges with normal chat systems is secure communication between the users. The corporate or scientific organization may have information which need be protected with intruders or hacker. The chat system should implemented such a way that the information need be secured.

**2.1.3 The Concept of multi-user chat System as a Solution**

Information control is also fundamentally easier with the multiuser chat system

because of the maintainance of the users accounts regularly hence more security is enhanced.

**2.1.4 Multi-user chat System**

Enhances communication between the client and the server.

**2.1.5.0 The Concept of:**

**2.1.5.1 Java Swings API’s**

Swing was developed to provide a more light weight set of graphical user interface components than the earlier Abstract Window Toolkit. Swing build as lightweight component which provides a native look and feel that emulates platform dependent look on particular platforms, and swing also supports a pluggable way of look and feel that allows applications customize and to have a look and feel unrelated to the defined platform.

**2.1.5.2 Java Security API’s**

The Java platform strongly emphasizes programming concept like security, including byte code language security, cryptography, public key infrastructure (PKI), and authentication, secure communication, and access control.

**2.1.5.3 Java Encryption API’s**

The Java Cryptography Architecture is a big implementation piece of the platform and it have a provider architecture implementation and a set of application programming interface for digital signatures, encryption and decryption, message digests, certificates and certificate validation, secure key management and generation and secure random number generation, to name a few. Using these application programming interface one can easily integrate security into their business logic application code.

**2.1.5.4 Java networking API’s**

One can write java applications that communicate over the network mean you are programming at the application layer. Typically, someone writing programs no need to concern about the TCP and UDP layers. Instead of this you can make use of the classes in the java.net package and these classes provide platform independent network communication.

Through the classes in java.net, Java programs can use UDP or TCP to communicate over the network. The classes URL, URL Connection, Server Socket and Socket all use for TCP to communicate over the network and the classes Datagram Packet, Datagram Socket, and Multicast Socket are for use with UDP.

**2.1.5.5 Java database connectivity API’s**

The Java Database Connectivity is the trade name for Java API, which supports Java, programs that access relational database. It also gives programmers uniform Interface for access and manipulate a wide range of relational database. By using JDBC API gives application written in the Java Programming Language allows it to execute SQL statements, retrieve results, present data in user-friendly interface and propagate changes back to the database

**2.1.5.6 Socket programming**

Sockets provide the communication mechanism between two computers using TCP. A client program creates a socket on its end of the communication and attempts to connect that socket to a server.

When the connection is made, the server creates a socket object on its end of the communication. The client and server can now communicate by writing to and reading from the socket.

The java.net. Socket class represents a socket, and the java.net. ServerSocket class provides a mechanism for the server program to listen for clients and establish connections with them.

The following steps occur when establishing a TCP connection between two computers using sockets:

* The server instantiates a ServerSocket object, denoting which port number communication is to occur on.
* The server invokes the accept( ) method of the ServerSocket class. This method waits until a client connects to the server on the given port.
* After the server is waiting, a client instantiates a Socket object, specifying the server name and port number to connect to.
* The constructor of the Socket class attempts to connect the client to the specified server and port number. If communication is established, the client now has a Socket object capable of communicating with the server.
* On the server side, the accept() method returns a reference to a new socket on the server that is connected to the client's socket.

After the connections are established, communication can occur using I/O streams. Each socket has both an Output Stream and an Input Stream. The client's Output Stream is connected to the server's Input Stream, and the client's Input Stream is connected to the server's Output Stream.

TCP is a two way communication protocol, so data can be sent across both streams at the same time.

**2.1.5.7 Multithreading**

Concurrency is the ability to run multiple parts of a program or multiple programs in parallel. Concurrency can greatly improve the performance of a application if certain tasks can be executed asynchronously or in parallel.

Threads are also called lightweight processes which have their own call stack but an access shared resource. Every thread has its own memory cache and if a thread reads shared data it stores this data in its own stack of memory cache and used in the process of execution.

**2.2 Multi-user chat system Structure**

Contains the following modules and sub-modules:

1.User Login.

2. User Details- User maintenance.

- password change.

3. Send and receive mails.

4. Add friends in the network.

5. Help- Help.

- About.

**2.3 Efforts to Improve multi-user chat system**

Authentication to improve security of the system,this will enable scalability of the multiuser chatting system.

Enforcing stardards that provides important services to the system

safely and securely.

**2.4.0 Modern chat systems**

They require high costs to set up,this is due to resources and procedures that have to be implemented.

Communication in modern chat systems is easier and efficient.

They are more reliable due to use of modern methods and techniques of data communication.

**2.4.2 Technologies and Trends in chatting systems**

Various chatting systems have various mechanisms of administering the relationship between users

Chatting systems allows the convenience of allowing the users to work on their

own workstation machine.

Chatting systems are advancing mainly through education and training of peope in implementing modern systems.

**2.4.3 Efforts to Improve Current chatting systems**

Improvement of communication model,this is through the use of stardands that enhance effective interaction among users for example email services and messaging services.

Application of technology through training web developers improves skills in implementing chatting systems.

**Chapter 3: Design**

1. **Introduction**

For two programs to use the TCP/IP facilities, one should take the role of client and the other should take the role of server. The client initiates a socket and tries to send a connection request on that port. For the connection to take place, the client should be on the connection mode and the server should be on the listening mode

The system provides for other several modules:

1.User Login

2. User Details

3. Send and receive mails

4. Add friends in the network

5. Help

The four major modules lead to other sub-modules where a user can carry out specific work.For example maintain his/her own account.

3.1 **Information Gathering**

**a)Interviewing**

An information-gathering interview is a directed conversation with a specific purpose that

uses a question-and-answer format.We acquired information through offering open ended questions to other prosperous people who had managed various projects before.This enabled us to get further information and skills on how to analyse and design our projects.

**b)Investigation**

We gathered alot of information through investigation on various aspects concerning our project.This promoted guidance on how to design our project.

**3.2 Analysis Phase :**

**Feasibility Study:**

Feasibility Study is conducted to see if the proposed system is a feasible one with all respects. Feasibility Study is lot of the system proposal according to its workability impact of the organization, ability to meet uses need and effective use of resources. There are three main aspects in the feasibility study. The feasibility of a project can be ascertained in terms of technical factors, economic factors, or both.  A feasibility study is documented with a report showing all the ramifications of the project.  In project finance, the pre-financing work is to make sure there is no "dry rot" in the project and to identify project risks to ensure they can be mitigated and managed in addition to ascertaining "debt service" capability.

**Economic Feasibility:**

In economic feasibility cost/benefit analysis is done. There is no need spend any monthly there after. The web cam needed is available at the least possible cost at the same time reliable. Since benefits outweigh the cost. It is economically feasible.

**Operational Feasibility:**

An operationally feasible system is one that will be used effectively after it has been developed. If users have difficulty with a new system, it will not produce the expected benefits. The proposed system is found to be operationally feasible because of the following reasons. It needs only one person in the reception section. There is no difficulty in using the front end which has been developed. Even the users who don’t have any knowledge in computers the user friendliness provides them convenience and case. The system is designed, in such a way that not only the person currently handling this work can operate the system but a person who is new to the system with case. Hence this system is found to be operationally feasible.

**Technical Feasibility:**

Technical feasibility centers on the existing system and to the extent it can support the proposed system. The design of the cyber eye is in such a way that it can be easily managed. If budget is not a serious constraint then the project is judged technically feasible. The system is assigned to fit the available software the hard ware.

**Market Feasibility:**

This is a generalized project so that it can be used in any organization like Factories, Offices, and Colleges etc. The existing traditional system provides only a person - to - person communication. The person who receives the visitor obtain information such as name, whom to meet, coming from where and it is informed to the higher authority. Based on the decision made by the higher authority the visitor is allowed or not allowed. This kind of communication is still used by lower level organizations. Higher-level organizations use the intercom facility to communicate with other portions of the organization. This system provides immediate passing and receiving of information.

**System Requirement (IEEE Format SRS) :**

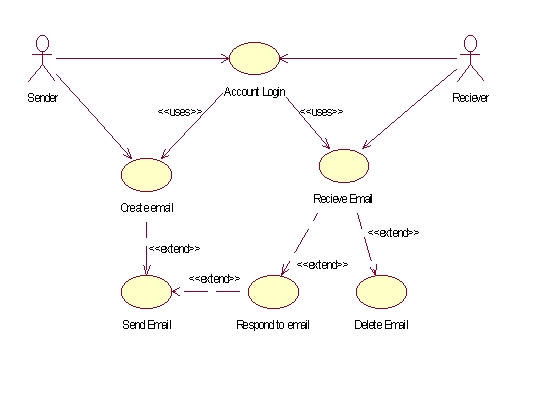
**Hardware Requirement:**

* + Local Area Network.
  + Hardware Tools such as NIC cards, Cable.
  + Recommended Ram 128MB.

**Software Requirement:**

* + JRE 1.2 or above
  + IIS Server
  + Html 3.2 and 4.0 supported Browsers
  + Any Operating System That Can Run JRE.
  1. **Design Phase**

**Use Case Diagram:**

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**Data Flow Diagram :**

**Level 0 DFD**

SMTP Protocol

Mail Server

User

## 

## 

## Level 1 DFD

LOG IN

Authentication

Mail server

SMTP protocol

User

REGISTRATION

User file

**Level 2 DFD**

**Junk Mail**

**Delete Mail**

User

Check Inbox

**Empty Inbox**

Mail file

**Mark Mail as Favourite**

**Level 3 DFD**

