INTRANET EMAIL SYSTEM

A

Project report

Submitted for b.tech 4th year (IT) final year project work

Bachelor of Technology

of

Maharana Institute of Professional Studies, Kanpur

By

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Certificate

This is to certify that this document entitled “**Intranet EMail System**”, is a bonafide record of the project work done by “**Mr. Priyam Gangwar**” (0834913033), “ **Mr. Piyush Gupta** ” (0834913028) and “ **Mr. Mridul Kashyap** ” (0834913024) and in the year 2011-2012, under our supervision and guidance. This report has been submitted to the **Department of Information Technology**, of **Maharana Insitute of Professional Studies, Kanpur**, in partial fulfillment of the requirements for the award of the degree of **Bachelor of Technology** in **Information Technology.**

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ABSTRACT

The aim of the project was to develop an Intranet web based mail server system that can be connected by a client browser, Apache being used as the web server on the email server. The aim was to implement the necessary functionalities to the users such as receiving and organizing mails through an user interface provided by the system itself. i.e. A graphical interface so that the users can do their desired work smoothly. Apart from that, any user can register and use the service so a registration system is also developed.

The system starts with the welcome page prompting the user to establish his authentication. He is allowed to see his mailboxes, read mails and send mails to the other users only after his/her account is verified.

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ACKNOWLEDGEMENT

We thank Mr. Kushal Dwivedi and Mr. Ankur gupta, Senior Lecturer, Department of Information Technology, MIPS, Kanpur for their guidance and co-operation. We are highly benefited through his valuable suggestions during the course of the project.

Besides we thank all our friends for their encouragement and help they provided. We also extend our gratitude to the entire faculty of MIPS.

1. INTRODUCTION

1.1 Conventional method for message passing in an organization:

The conventional method was based upon manual message passing. It requires person to go to a department to get the information from there and then logging in the record of progress or other details. This method was time taking and also it contained more chances of human errors. It slowed down the processing in the organization.

1.2. Proposed System:

The proposed system is to develop an online email system that would eliminate the requirement of person from going places to places to collect the information or sending and receiving the messages. The system is based upon binding the whole system with a centralized message storage system. Where all the departments can connect and see what information is there for them. The proposed system is similar to the conventional email system, with the difference that it would only be accessible inside an organization. That is, the domain of the System will remain only inside the organization. It is helpful in keeping the secrecy of the organization secure.

1.3. Security measures in a conventional email system:

The primary measure in conventional email system is encryption, the method of encryption varies from AES to DES and RSA. However, These encryption techniques being very strong measures for securing the content over a network, our system does not use any of these.

Another thing to notice with these email systems is that they although provide a good quality of security but they ultimately connect to a less secure network, Internet. What if an organization does not need to connect to internet for transferring private messages, why risking the security of such organizations by using the conventional email system for simple message transfers. Our system provides the solutions for such organizations.

1.4. Security measures in proposed system:

Like already discussed that our system does not connects to any of the less secure or highly secure network for message passing .The message passing is confined within the organization only and so automatically it is much more secure than some other message passing network.

1.5. REQUIREMENTS SPECIFICATION

1.5.1. FUNCTIONAL REQUIREMENTS

Login Page:

There should be a login page for the existing user where the username and password are verified and then if he is a valid user, he is allowed for further advancements.

Inbox:

The logged in users should be able to see the lists of new mails as well as the existing ones.

Compose Mail:

User should be able to compose mails and send them to the other users.

Reply/Forward/Delete:

The user should be able to reply to mails, forward mails and also delete mails from his mailboxes. The deleted mails should be moved to the Trash mailbox.

Save as Draft:

The user should be able to save the incomplete mails in the Draft mailbox and these can be completed later and can be sent to others.

Record Sent mails:

There should be a provision for keeping a record of the mails that have been sent by the user in a separate mailbox called Sent mailbox.

1.5.2 NON FUNCTIONAL REQUIREMENTS

Database:

Integrity should be maintained and all the constraints should be satisfied.

Portability:

The web client system should work in both the windows and the Linux and Unix platform.

1.6. SOFTWARE REQUIREMENTS

The following softwares are to be used for the project.

1.6.1. Apache Server

What is it?:

The Apache HTTP Server is a powerful and flexible HTTP/1.1 compliant web server. Originally designed as a replacement for the NCSA HTTP Server, it has grown to be the most popular web server on the Internet. As a project of the Apache Software Foundation, the developers aim to collaboratively develop and maintain a robust, commercial-grade, standards-based server with freely available source code.

Why apache:

Apache has been shown to be substantially faster, more stable, and more feature-full than many other web servers. Although certain commercial servers have claimed to surpass Apache's speed (it has not been demonstrated that any of these "benchmarks" are a good way of measuring WWW server speed at any rate), we feel that it is better to have a mostly-fast free server than an extremely-fast server that costs thousands of dollars. Apache is run on sites that get millions of hits per day, and they have experienced no performance difficulties.

Apache is run on over 6 million Internet servers (as of February 2000). It has been tested thoroughly by both developers and users. The Apache Group maintains rigorous standards before releasing new versions of their server, and our server runs without a hitch on over one half of all WWW servers available on the Internet. When bugs do show up, we release patches and new versions as soon as they are available.Apache Server should be installed which serves as the web server.

1.6.2. MYSQL Server

The MySQL™ software delivers a very fast, multi-threaded, multi-user, and robust SQL (Structured Query Language) database server. MySQL Server is intended for mission-critical, heavy-load production systems as well as for embedding into mass- deployed software. Oracle is a registered trademark of Oracle Corporation and/or its affiliates. MySQL is a trademark of Oracle Corporation and/or its affiliates, and shall not be used by Customer without Oracle's express written authorization. Other names may be trademarks of their respective owners.

Why MySQL:

- MySQL is a relational database management system.

A relational database stores data in separate tables rather than putting all the data in one big storeroom. This adds speed and flexibility. The SQL part of “MySQL” stands for “Structured Query Language.” SQL is the most common standardized language used to access databases and is defined by the ANSI/ISO SQL Standard. The SQL standard has been evolving since 1986 and several versions exist. In this manual, “SQL-92” refers to the standard released in 1992, “SQL:1999” refers to the standard released in 1999, and “SQL:2003” refers to the current version of the standard. We use the phrase “the SQL standard” to mean the current version of the SQL Standard at any time.

- MySQL software is Open Source.

Open Source means that it is possible for anyone to use and modify the software. Anybody can download the MySQL software from the Internet and use it without paying anything. If you wish, you may study the source code and change it to suit your needs. The MySQL software uses the GPL (GNU General Public License).

- The MySQL Database Server is very fast, reliable, and easy to use.

If that is what you are looking for, you should give it a try. MySQL Server also has a practical set of features developed in close cooperation with our users. You can find a performance comparison of MySQL Server with other database managers on our benchmark page. See Section 7.12.2, “The MySQL Benchmark Suite”.

General Information:

MySQL Server was originally developed to handle large databases much faster than existing solutions and has been successfully used in highly demanding production environments for several years. Although under constant development, MySQL Server today offers a rich and useful set of functions. Its connectivity, speed, and security make MySQL Server highly suited for accessing databases on the Internet.

- MySQL Server works in client/server or embedded systems.

The MySQL Database Software is a client/server system that consists of a multi-threaded SQL server that supports different backends, several different client programs and libraries, administrative tools, and a wide range of application programming interfaces (APIs). We also provide MySQL Server as an embedded multi-threaded library that you can link into your application to get a smaller, faster, easier-to-manage standalone product.

- A large amount of contributed MySQL software is available.

It is very likely that your favorite application or language supports the MySQL Database Server.

MYSQL Server should be installed that stores the users details.

1.6.3. PHP 5.2

What is it?:

PHP, which stands for "*PHP: Hypertext Preprocessor*" is a widely-used Open Source general-purpose scripting language that is especially suited for Web development and can be embedded into HTML. Its syntax draws upon C, Java, and Perl, and is easy to learn. The main goal of the language is to allow web developers to write dynamically generated web pages quickly, but we can do much more with PHP.

Why use php:

PHP has weakly typed data, which tends to result in fewere data collisions than strongly typed languages.PHP tends to incur less overhead than ASP.NET or JSP, for example. PHP is open-source software and therefore tends to be quickly repaired and generally secure. It has a C-like syntax and uses similar functions and objects as ANSI C. There are no licensing fees, so it tends to be cheaper to deploy than other server-side scripting languages.

PHP is mainly focused on server-side scripting, so you can do anything any other CGI program can do, such as collect form data, generate dynamic page content, or send and receive cookies. But PHP can do much more. There are three main areas where PHP scripts are used.

- Server-side scripting. This is the most traditional and main target field for PHP. You need three things to make this work. The PHP parser (CGI or server module), a web server and a web browser. You need to run the web server, with a connected PHP installation. You can access the PHP program output with a web browser, viewing the PHP page through the server. All these can run on your home machine if you are just experimenting with PHP programming
- Command line scripting. You can make a PHP script to run it without any server or browser. You only need the PHP parser to use it this way. This type of usage is ideal for scripts regularly executed using cron (on *nix or Linux) or Task Scheduler (on Windows). These scripts can also be used for simple text processing tasks.

- Writing desktop applications. PHP is probably not the very best language to create a desktop application with a graphical user interface, but if you know PHP very well, and would like to use some advanced PHP features in your client-side applications you can also use PHP-GTK to write such programs. You also have the ability to write cross-platform applications this way. PHP-GTK is an extension to PHP, not available in the main distribution.
- PHP can be used on all major operating systems, including Linux, many Unix variants (including HP-UX, Solaris and OpenBSD), Microsoft Windows, Mac OS X, RISC OS, and probably others. PHP has also support for most of the web servers today. This includes Apache, IIS, and many others. And this includes any web server that can utilize the FastCGI PHP binary, like lighttpd and nginx. PHP works as either a module, or as a CGI processor. So with PHP, you have the freedom of choosing an operating system and a web server. Furthermore, you also have the choice of using procedural programming or object oriented programming (OOP), or a mixture of them both.

With PHP you are not limited to output HTML. PHP's abilities includes outputting images, PDF files and even Flash movies (using libswf and Ming) generated on the fly. You can also output easily any text, such as XHTML and any other XML file. PHP can autogenerate these files, and save them in the file system, instead of printing it out, forming a server-side cache for your dynamic content.

One of the strongest and most significant features in PHP is its support for a wide range of databases. Writing a database-enabled web page is incredibly simple using one of the database specific extensions (e.g., for mysql), or using an abstraction layer like PDO, or connect to any database supporting the Open Database Connection standard via the ODBC extension. Other databases may utilize uCRL or sockets, like CouchDB.

PHP also has support for talking to other services using protocols such as LDAP, IMAP, SNMP, NNTP, POP3, HTTP, COM (on Windows) and countless others. You can also open raw network sockets and interact using any other protocol. PHP has support for the WDDX complex data exchange between virtually all Web programming languages. Talking about interconnection, PHP has support for instantiation of Java objects and using them transparently as PHP objects.

PHP has useful text processing features, which includes the Perl compatible regular expressions (PCRE), and many extensions and tools to parse and access XML documents. PHP standardizes all of the XML extensions on the solid base of libxml2, and extends the feature set adding SimpleXML, XMLReader and XMLWriter support.

And many other interesting extensions exist, which are categorized both alphabetically and by category. And there are additional PECL extensions that may or may not be documented within the PHP manual itself, like » XDebug.

PHP 5.0 or later must be installed on the server running the system.

1.6.4 Jquery Library

About JQuery:-

JQuery is a write Less, Do more JavaScript Library. When it comes to handling Ajax requests, Animations and Events JQuery is the best in the Industry today. The most important reason for its popularity is that it is fast, concise and Easy to implement. Instead of writing a complex code to do a simple task JQuery automates the same task with attractive GUI, smooth Interface with less code that too is easy to learn and implement.

Why Use Jquery

Jquery is a coding language that is a branch from JavaScript. Jquery works like JavaScript where its used to help with interaction and effects with your development code. Jquery hasn't been around very long, it was release in January 2006 and only on version 1.4.0. Jquery is a new and exciting technology that is catching on quickly and making the internet more interactive and enjoyable.

The best featuring for Jquery is the effects you can accomplish, with less code than what it would take with JavaScript. Most common Jquery effects are drop down menus, drag and drop elements, animations and form validation. Developers have also connected this with other coding languages like JSP, ASP, PHP and CGI.

1.7 Motivation

Communication brings people closer. The advent of internet and electronic mails replaced the traditional postal mails. The virtual gap between people is brought to the minimum. Internet and emails are now part and parcel of every ones life. This has a great potential in the real world as most of the organizations and institutions have their dedicated mail services. And during this course of project, an effort has been made to mimic the existing mail systems with a purpose of understanding and implementing one such service.

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2. System Study

E-mail technology for the Internet (as opposed to closed private systems) follows a number of universal standards as codified by the International Telecommunication Union (ITU) and the International Organization for Standardization (ISO). These standards help ensure that e-mail, like Internet communications in general, is not bounded by platform or geography.

An e-mail message is essentially one or more files being copied between computers on a network such as the Internet. This transfer of files is automated and managed by a variety of computer programs working in consort. A simple e-mail may be a single text file; if special formatting, graphics, or attachments are used in the message, multiple binary files or encoded Hypertext Markup Language (HTML) files may be transmitted in a single e-mail message.

A typical e-mail system consists of at least three software components with supporting hardware:

- the user's e-mail application
- a message transfer agent or engine
- a message store

The e-mail application is, of course, where all e-mail originates or terminates. Full-featured e-mail applications often reside on the user's local computer; however, it is also common to use server-based e-mail programs in which the user logs into a computer through a terminal program or a web browser and utilizes e-mail capabilities that reside entirely on the remote computer. The latter case is typical of many of the free e-mail services offered on the web. Lotus Development Group's Lotus Notes has been the market-leading e-mail application for corporate users, with a user base of 25 million in 1998. That year, it was followed by a fast-growing challenger, Microsoft Corporation's Exchange package, which garnered 18 million licensed users.

The message transfer agent (MTA), also called a mail engine, is behind-the-scenes software that runs on a mail server, the computer(s) dedicated to sorting and routing e-mail in a network. The MTA determines how incoming and outgoing messages should be routed. Thus, if a message is sent from one internal corporate user to another, the MTA normally routes the e-mail within the corporate system without sending it through the Internet. If, however, a message is intended for a user outside the organization, the mail server transmits the file to an external gateway or a public Internet backbone router that will, in turn, deliver the message to the recipient's system. This is a simplification, as a message may actually be passed through several intermediate computers on the Internet before reaching its destination.

The message store is the software and hardware that handles incoming mail once the MTA has determined that mail belongs to a specific user on the system. The store may be configured to work in different ways, but, in essence it is user-specific directory space on a network server in which unread incoming messages are stored for future retrieval by the e-mail applications. This is where, for instance, e-mail sent overnight sits until the recipient turns on his computer the next day and opens his e-mail program. The software configuring the message store may automatically delete copies of the messages once they are downloaded to the user's computer or it may archive them. Message stores are also capable of automatically categorizing mail and performing other mail-management tasks.

3. Proposed system and its advantages:

The proposed system is an intranet email system, that people inside different departments of an organization can use, or according to need of the organization it may provide a way of communication inter-organizationally too.

The system is ought to be placed on a central server running an Apache Tomcat web server, a MySQL server and database for keeping the messages, and PHP 4.0 or greater.

A user, through the system may send an email to another employee in organization, receive mails himself, save mails to be sent at later time in drafts, check his previously sent mails, delete mails and much more. The system contains almost all the features a modern email server has, with the difference that it would for intra or inter-organizational purpose only.

Another difference being, instead of using the text file maintaining method like in regular email server systems, our project would use a MySQL database to store the messages. This means one more difference to be created automatically, which is, there would be no need to use the protocols like SMTP, POP3 or IMAP. We will not send the messages in the form of packets of these protocols but, in the packets of the regular HTTP protocol.

We also, are not using the regular encryption techniques to provide the security to the message content. Using such an encryption technique is useful for maintaining the integrity of the content on public network like internet. But our system is not supposed to work on internet. So using such encryption techniques will increase the process time, server overhead and ultimately the operation cost of the system. However, if really necessary a user can use external third party services to encrypt the message before sending. Although as from our studies, in a corporate network one would hardly ever need to do that.

Intranet Email System does not have any encryption technique to provide the security, but it does not mean it does not have any kind of security. The system consist a self-embedded steganography module. A user if wants to send the message with extended security, he can hide the message using this module. The module hides the message within a bmp image provided by the user to the system. Then he can send this file to other user like an attachment in the mail. The user on other side when receives this image (with the text hidden inside it) can extracted the text out of it if he knows the key used by the sender (that is, shared key). This type of security hasn't been anywhere else. So It is quite new in it's type. And like any new technique when it comes to existence it has less vulnerabilities, which helps the Intranet Email System to be more secure than other such systems in it's class.

3.1 Database Fields Specification

This is the format of the table and the required fields used for maintaining the personal data of the users and thus enable the users search for the required mail ids.

Table Name**: Messages**

Fields:

Message_id:

Message_body:

Time:

Date:

Attachment:

Table Name: **User**

Fields:

User_Id:

Password:

Name:

Dept:

Table Name: **Sent**

Fields:

Sr_no:

From_id:

Message_id:

To_id:

Table Name: **Drafts**

Fields:

Sr_no:

User_id:

Message_id:

Table Name: **Trash**

Fields:

Sr_no:

User_id:

Message_id:

3.2 States and their meaning in the System:

3.2.1. Non-Authenticated State

In non-authenticated state, the client must supply authentication credentials before most commands will be permitted. This state is entered when a connection starts unless the connection has been pre-authenticated.

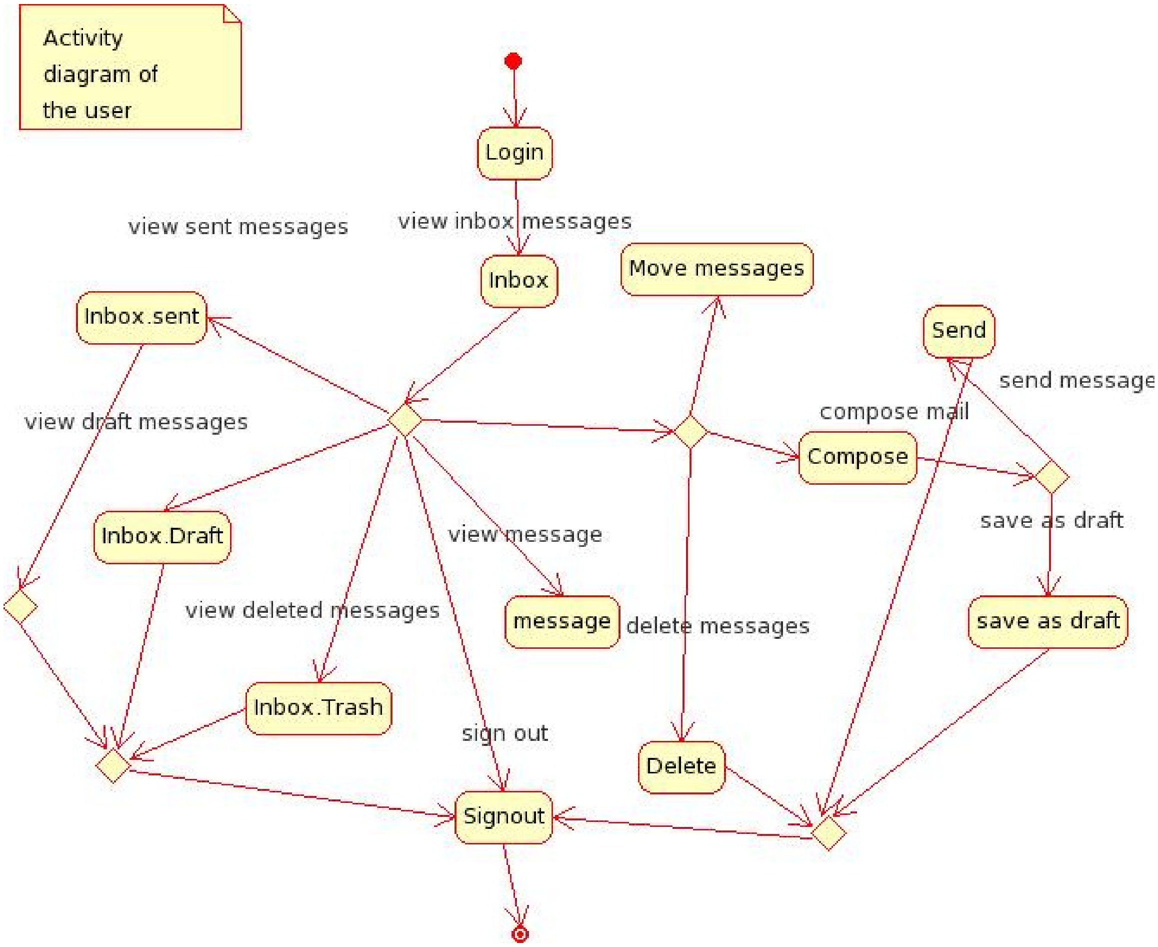
3.2.2 Authenticated State

In authenticated state, the client is authenticated and must select a mailbox to access before commands that affect messages will be permitted. This state is entered when a pre-authenticated connection starts, when acceptable authentication credentials have been provided, or after an error in selecting a mailbox.

3.2.3 Logout State

In logout state, the connection is being terminated, and the server will close the connection. This state can be entered as a result of a client request or by unilateral server decision.

3.3 Activity Diagram of the Users



Activity Diagram of the User

It is an activity diagram of the general user. First of all, the user encounters a welcome page that prompts him to enter the valid user name (or valid user- id) and the corresponding password. After a successful user login, he is allowed to read his mails from the Inbox mailbox. He then can read the mails from the other mailboxes - Sent, Draft and Trash. He can also organize mails between the existing folders (or mailboxes).

Apart from composing mails, he is also allowed to save the incomplete mails in the Draft mailbox and can any time resume them and compose later on. The sent folder contains all the records of the mails that are sent to the other users.

He then can logout from the mail service after the successful transactions. Once the user is logged out, he is only allowed through the login page.

4. Project Analysis:

a. Cost Analysis:

The project cost includes the wages given to the programmers, project managers, analysts (senior and junior) and the cost incurred to collect all the resources used by these people in completing the project. In our project, since all the work is completed by us the students we are only adding the costs of the resources that we had to procure in objective of completing the task.

In addition, the primary resources used in the project are either all open source or freeware. So the cost analysis stays in the cost estimation of the human resources. Which is not applicable here

b. Time Analysis

The estimated time for the completion of the project has come out to take up a time span of 3 months. The project will be started on 15 February 2012 and project completion is estimated to be reached till 30 April 2012.

The modules will prepared by 3 coders information of whom is given earlier in the same documentation.

The project in the duration of development is to circulate among these coders for a definite time, so that each coder can modify the project according to his own area of expertise.

The total time, which the project apparently will take to complete, is determined by addition of the time durations for which the project was along with these coders.

c. Users:

Not every project is made for everyone, because some project requires a user to have some knowledge of certain technologies.

So it must be specified properly what kind of users would be able to use the project. i.e. what technology does a user need to know before he starts working on this project?

Speaking about this project, almost every kind of user can use this project. All the knowledge they need to have is English language and a little knowledge of computer.

Other than that, we already specified that the project is build to use in a local intranet environment. That is only the users in the domain of a particular organization which is using the project are authorized to use the project. For the same purpose, we intend to enable the project with an IP based access filtration system in future. However it currently has only the login authentication based filtering system.

d. Security:

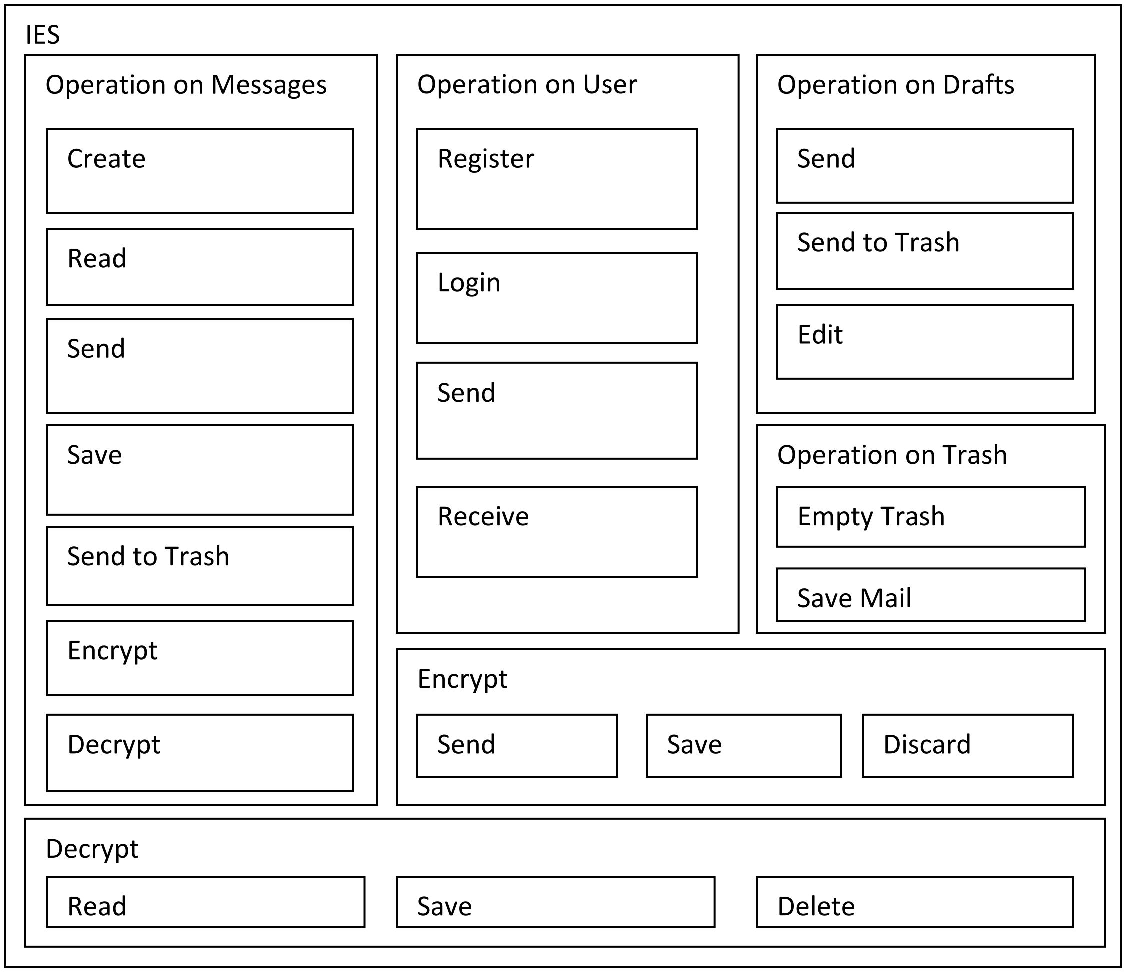
For the security purpose in the project, there are basically two security measures. One is for authentication of a user and the other is to protect the data flowing on the internet, to protect it from the attackers across the network.

The former is provided with the help of a login-authentication based method. A user first has to register into the system, with his registration he will be provided with a user name and a password. For each of his consecutive visits to the system, to perform any action through the system he will be required to give his credentials to get the action privileges. After he has identified himself to the system he may perform the desired action.

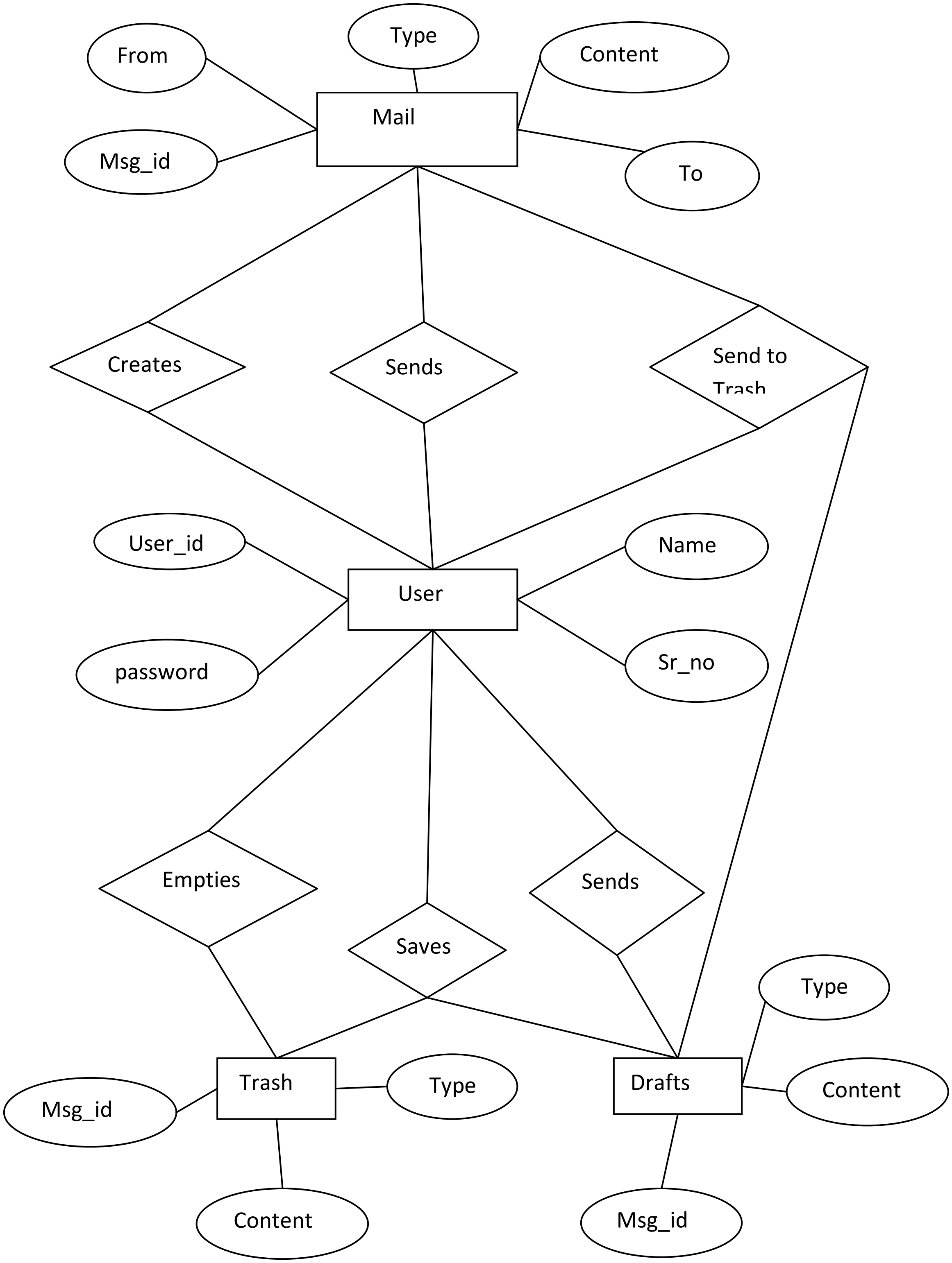
The later is provided by the use of an quite new data hiding technology, which is text-image steganography. The text in a mail that has to be sent over the intranet is hidden in a bmp image. Then this image is sent to the receiver. No one can see what is inside the image unless it has been decrypted with the key with which it was encrypted inside the image. So the receiver, if has the key, he can simply extract the text out of the image and can get the message.

5. INTERNAL ARCHITECTURE

5.1. Module Diagram:

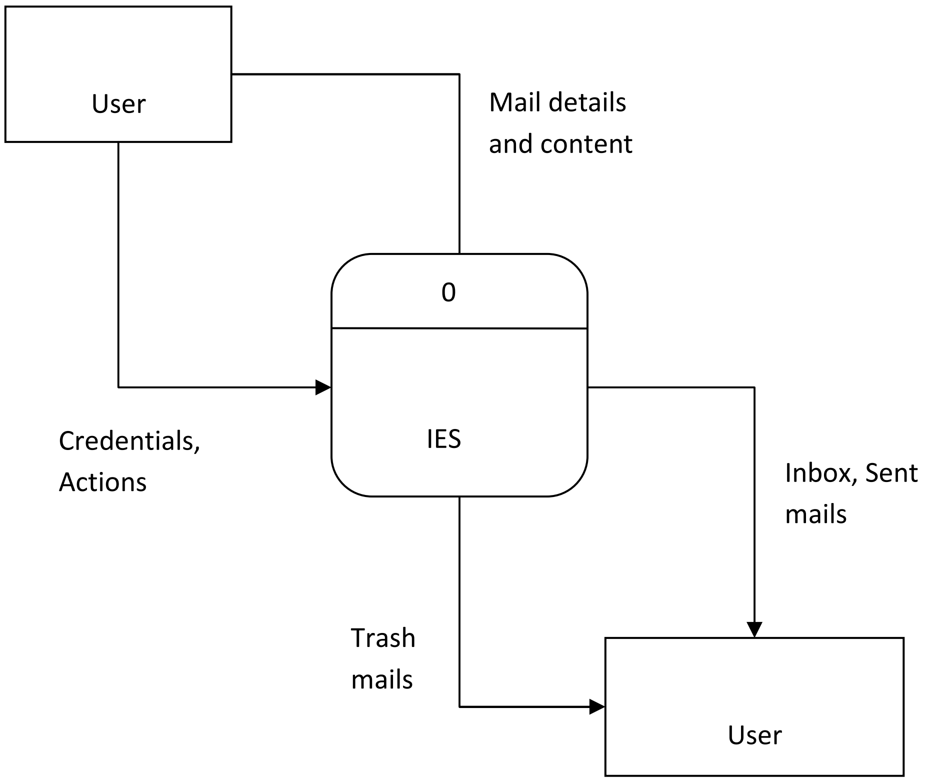


5.2. E-R diagram:

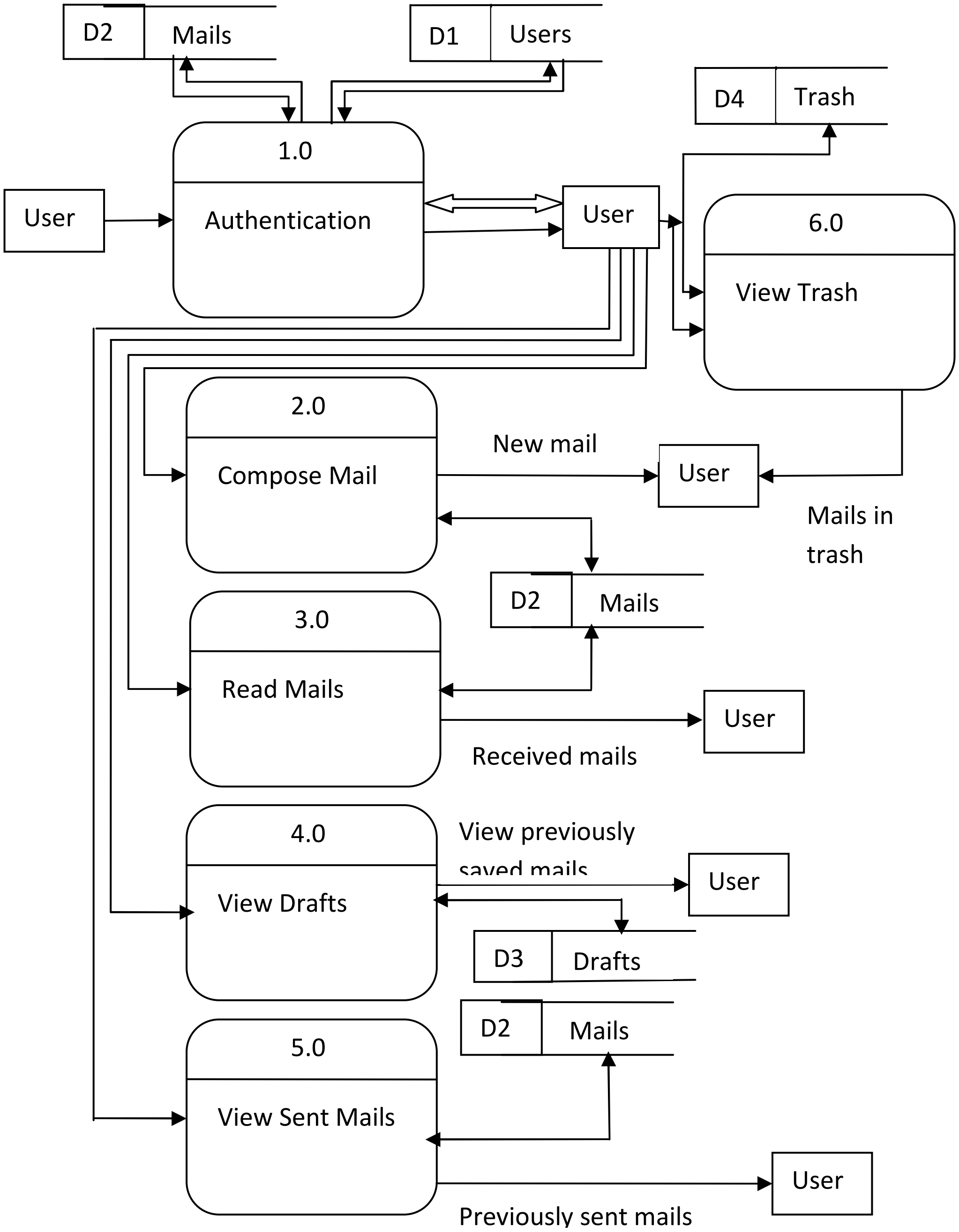


6. Data Flow Diagram:

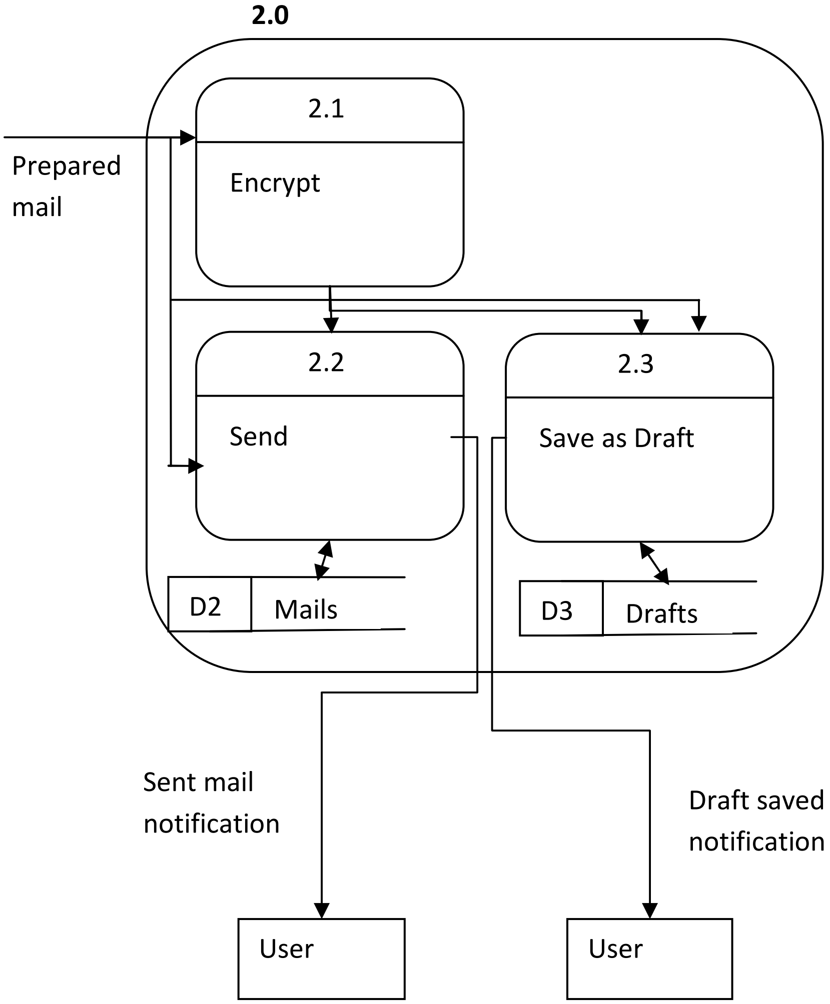
6.1. Context Level:

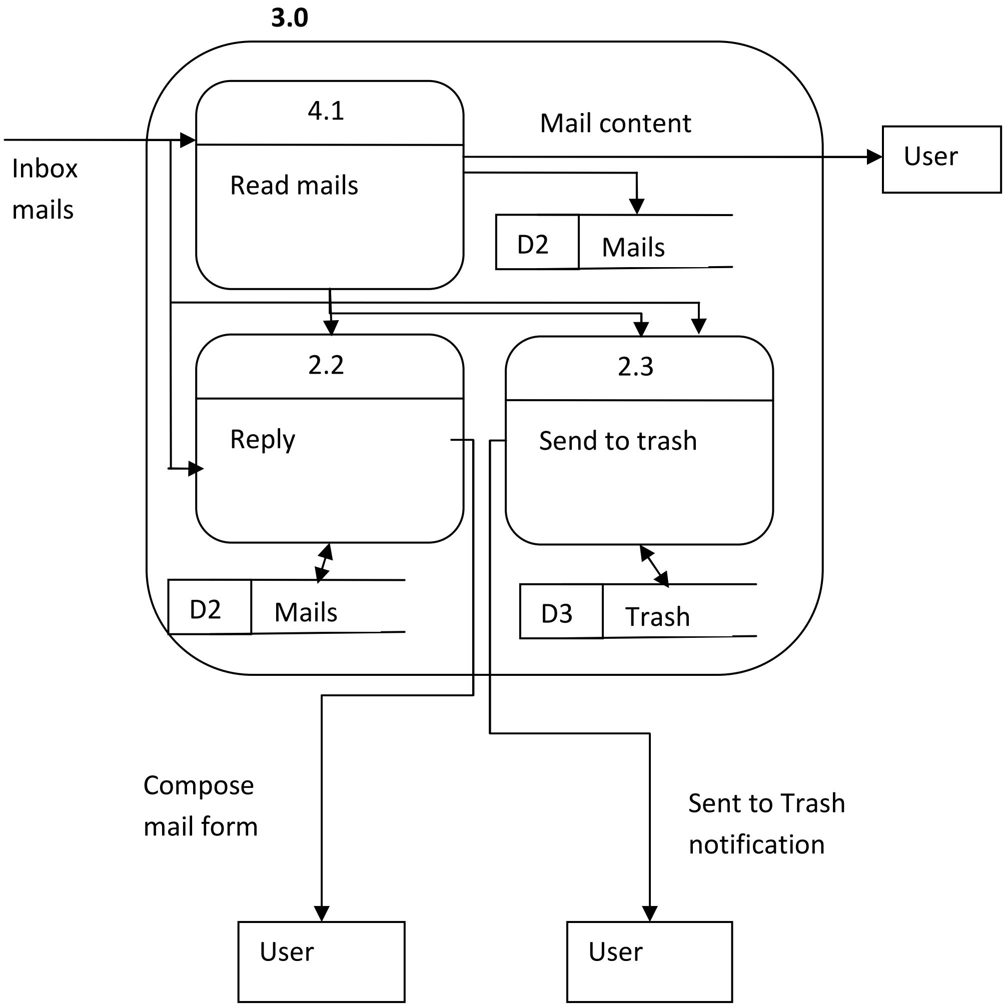


6.2. Level 0 DFD:



6.3. Level 1 DFD:




3.0
4.1
Read mails
Mail content
User
Inbox
mails
D2
Mails
2.2
Reply
2.3
Send to trash
D2
Mails
D3
Trash
Compose
mail form
Sent to Trash
notification
User
User

7. Further Enhancements:-

Further the system can be made much more secure by adding some security features, in fact our team has a major security issue in mind that has not been used in any of the emailing system developed so far.Unlike the conventional system, our system will not use any kind of encryption technique, instead it will use steganography. It uses the “character hiding within an image” approach for hiding the text. Actually when a user chooses to send the message with the extended security, the system hides the text given by a user in the image specified by him. Then the image is sent as an attachment in the email. On the other side the user who knows the steg-key, can open the text and then read it.Also the user interface can be made much more responsive and good looking.

The system can be made much more scalable and flexible and it could serve a greater number of users than it could right now.

7. Conclusion:-

The system was developed successfully within the scheduled time duration of two and a half months which included hectic task of requirement analysis, designing, coding, testing and deployment.

All the requirements were fulfilled by the system keeping in view the portability , flexibility and ease of usage which was welcomed by the organizations who were asked to deploy the system as a trial run.

Furthermore it was analysed that maximum of the people who complained about the delay of data/information from other departments in their work was solved and the system was adored by them.

There were few security and user friendly features which are proposed for further enhancements and upon the inclusion of the enhancement features the system would provide the security and ease of usage like never before.

Bibliography & References

The books and knowledge resources being referred during the completion of this project are-

- ✓ Html Xhtml And Css Bible 3rd Edition
- ✓ Wrox - Beginning Web Programming with HTML, XHTML and CSS
- ✓ Scriptin' with JavaScript- a beginner's guide
- ✓ visual quick start guide of JavaScript
- ✓ Packtpub.Learning.jQuery.3rd.Edition.Sep.2011
- ✓ advanced PHP programming
- ✓ Building Php Applications With Macromedia Dreamweaver Mx
- ✓ Apress.Beginning.PHP.and.MySQL.5.From.Novice.to.Professional.
- ✓ Code.google.com.
- ✓ System study of various mail domains.
- ✓ Google search

SCREENSHOTS