A Major Project

On

AN EFFICIENT FEEDBACK CONTROL MECHANISM FOR POSITIVE OR NEGATIVE INFORMATION SPREAD IN ONLINE SOCIAL NETWORKS

(Submitted In Partial fulfillment of the requirements for award of Degree)

BACHELOR OF TECHNOLOGY

In

COMPUTER SCIENCE AND ENGINEERING

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CERTIFICATE

This is to certify that the project entitled **"AN EFFICIENT FEEDBACK CONTROL MECHANISM FOR POSITIVE OR NEGATIVE INFORMATION SPREAD IN ONLINE SOCIAL NETWORKS"** being submitted by **CH. GAYATHRI (197R1A0572), K.ANITHA KUMARI (197R1A0582), Y. SUMAGNA (197R1A05B9)** in partial fulfillment of the requirements for the award of the degree of B.Tech in Computer Science and Engineering to the Jawaharlal Nehru Technological University Hyderabad, is a record of bonafide work carried out by them under our guidance and supervision during the year 2022-23.

The results embodied in this thesis have not been submitted to any other University or Institute for the award of any degree or diploma.

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ACKNOWLEDGEMENT

Apart from the efforts of us, the success of any project depends largely on the encouragement and guidelines of many others. We take this opportunity to express our gratitude to the people who have been instrumental in the successful completion of this project.

We take this opportunity to express our profound gratitude and deep regard to our guide **Ms. Tabeen Fatima**, Assistant Professor for her exemplary guidance, monitoring and constant encouragement throughout the project work. The blessing, help and guidance given by her shall carry us a long way in the journey of life on which we are about to embark.

We also take this opportunity to express a deep sense of gratitude to the Project Review Committee (PRC) **Dr. Punyaban Patel, Ms. Shilpa, Dr. M . Subha Mastan Rao & Mr. J. Narasimha Rao** for their cordial support, valuable information and guidance, which helped us in completing this task through various stages.

We are also thankful **to Dr. K. Srujan Raju**, Head, Department of Computer Science and Engineering for providing encouragement and support for completing this project successfully.

We are obliged to **Dr. A. Raji Reddy**, Director for being cooperative through out the course of this project. We also express our sincere gratitude to **Sri. Ch. Gopal Reddy**, Chairman for providing excellent infrastructure and a nice atmosphere throughout the course of this project.

The guidance and support received from all the members of **CMR Technical Campus** who contributed to the completion of the project. We are grateful for their constant support and help.

Finally, we would like to take this opportunity to thank our family for their constant encouragement, without which this assignment would not be completed. We sincerely acknowledge and thank all those who gave support directly and indirectly in the completion of this project.

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ABSTRACT

The wide availability of online social networks (OSNs) facilitates positive information spread and sharing. However, the high autonomy and openness of the OSNs also allow for the rapid spread of negative information, such as unsubstantiated rumors and other forms of misinformation that often elicit widespread public cognitive misleads and huge economic losses. Therefore, how to effectively control the negative information spread accompanied by positive information has emerged as a challenging issue. Unfortunately, this issue still remains largely unexplored to date. To fill this gap, propose an efficient feedback control mechanism for the simultaneous spread of the positive and negative information in OSNs. Specifically, a novel computational model is first proposed to present the temporal dynamics of the positive and negative information spread. Furthermore, the proposed mechanism restrains the negative information spread with minimal system expenses by devising and performing three synergetic intervention strategies. Technically, this mechanism intensively evaluates the number of seed users performing three intervention strategies. Besides, each seed user performs the received control task independently, and then the control plan for the next time step is adjusted dynamically according to the previous feedback results. Finally, evaluate the efficiency of the proposed mechanism based on the extensive experimental results obtained from two real-world networks.

LIST OF FIGURES

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CHAPTER-1: SYSTEM ANALYSIS

1.1 Existing System

Many studies on social media based emotion analysis are at the tweet level, using text-based linguistic features and classic classification approaches. A system called Mood Lensto perform emotion analysis on the Chinese Micro -blog platform Weibo, classifying the emotion categories into four types, i.e., angry, disgusting, joyful, and sad.

A existing system studied the emotion propagation problem in social networks, and found that anger has a stronger correlation among different users than joy, indicating that negative emotions could spread more quickly and broadly in the network. As stress is mostly considered as a negative emotion, this conclusion can help us in combining the social influence of users for stress detection.

1.1.1 Disadvantages of Existing System

1. Traditional psychological stress detection is mainly based on face-to-face Interviews, self-report questionnaires or wearable sensors. However, traditional methods are actually reactive, which are usually labor- consuming, time-costing and hysteretic.
2. These works mainly leverage the textual contents in social networks. In reality, data in social networks is usually composed of sequential and inter connected items from diverse sources and modalities, making it be actually cross-media data.
3. Though some user-level emotion detection studies have been done, the role that social relationships plays in one's psychological stress states, and how can incorporate such information into stress detection have not been examined yet.

1.2 Proposed System

Inspired by psychological theories, first define a set of attributes for the stress detection from tweet-level and user-level aspects respectively are:

a)Tweet-level attributes from content of user's single tweet, and

b)User-level attributes from user's weekly tweets.

The tweet-level attributes are mainly composed of linguistic, visual, and social attention (i.e., being liked, retweeted, or commented) attributes extracted from a single-tweet's text, image, and attention list. The user-level attributes however are composed of

- posting behavior attributes as summarized from a user's weekly tweet postings;
- social interaction attributes extracted from a user's social interactions with friends.

In particular, the social interaction attributes can further be broken into:

(i) social interaction content attributes extracted from the content of users' social interactions with the friends;

(ii) social interaction structure attributes extracted from the structures of users' social interactions with friends.

1.2.1 Advantages of Proposed System

1. Experimental results show that by exploiting the users' social interaction attributes, the proposed model can improve the detection performance (F1-score) by 6-9% over that of the state-of-art methods. It indicates that the proposed attributes can serve as good cues in tackling the data sparsity and ambiguity problem. Moreover, the proposed model can also efficiently combine tweet content and social interaction to enhance the stress detection performance.
2. Beyond user's tweeting contents, analyze the correlation of users' stress states and their social interactions on the networks, and address the problem from the stand points of: (1) **Social interaction content** , by investigating the content differences between stressed and non-stressed users' social interactions ; and (2) **Social interaction structure** , by investigating the structure differences in terms of structural diversity, social influence, and strong/weak tie.

3. User build several stressed-twitter-posting datasets by different ground-truth labeling methods from several popular social media platforms and thoroughly evaluate proposed method on multiple aspects.
4. Carry out in-depth studies on a real-world large scale dataset and gain insights on correlations between social interactions and stress, as well as social structures of stressed users.

1.3 Introduction

Psychological stress is becoming a threat to people's health nowadays. With the rapid pace of life, more and more people are feeling stressed. According to a worldwide survey reported by *New business* in 20101, over half of the population have experienced an appreciable rise in stress over the last two years. Though stress itself is non-clinical and common in our life, excessive and chronic stress can be rather harmful to people's physical and mental health. According to existing research works, long-term stress has been found to be related to many diseases, e.g., clinical depressions, insomnia etc.. Moreover, according to Chinese Center for Disease Control and Prevention, suicide has become the top cause of death among Chinese youth, and excessive stress is considered to be a major factor of suicide.

All these reveal that the rapid increase of stress has become a great challenge to human health and life quality. Thus, there is significant importance to detect stress before it turns into severe problems. Traditional psychological stress detection is mainly based on face-to face interviews, self-report questionnaires or wearable sensors. However, traditional methods are actually reactive, which are usually labor-consuming, time-costing and hysteretic.

CHAPTER-2: LITERATURE SURVEY

1. **Efficient coupling diffusion of positive and negative information in online social networks [X. Wang, X. Wang, F. Hao, G. Min, and L. Wang]**

https://ieeexplore.ieee.org/document/8717734

States that "Online social networks have become an effective and important social platform for communication, opinions exchange, and information sharing. However, they also make it possible for rapid and wide misinformation diffusion, which may lead to pernicious influences on individuals or society. Hence, it is extremely important and necessary to detect the misinformation propagation by placing monitors. First define a general misinformation-detection problem for the case where the knowledge about misinformation sources is lacking, and show its equivalence to the influence-maximization problem in the reverse graph. Furthermore, considering node vulnerability, aim to detect the misinformation reaching to a specific user. Therefore, study a τ-Monitor Placement problem for cases where partial knowledge of misinformation sources is available and prove its & num; P complexity. Formulate a corresponding integer program, tackle exponential constraints, and propose a Minimum Monitor Set Construction (MMSC) algorithm, in which the cutset² has been exploited in the estimation of reachability of node pairs. Moreover, generalize the problem from a single target to multiple central nodes and propose another algorithm based on a Monte Carlo sampling technique. Extensive experiments on realworld networks show the effectiveness of proposed algorithms with respect to minimizing the number of monitors "**.**

[2] State-dependent pulse vaccination and therapeutic strategy in an Si epidemic model with nonlinear incidence rate [K. Liu, T. Zhang, and L. Chen]

https://ieeexplore.ieee.org/document/8613016

States that "The state-dependent pulse vaccination and therapeutic strategy are considered in the control of the disease. A pulse system is built to model process based on an SI ordinary differential equation model. At first, for the system neglecting the impulse effect, give the classification of singular points. Then for the pulse system, by using the theory of the semicontinuous dynamic system, the dynamics is analyzed. Analysis shows that the pulse system exhibits rich dynamics and the system has a unique order-1 homoclinic cycle, and by choosing p as the control parameter, the order-

1 homoclinic cycle disappears and bifurcates an orbitally asymptotical stable order-1 periodic solution when p changes. Numerical simulations by maple 18 are carried out to illustrate the theoretical results ".

[3] Information diffusion nonlinear dynamics modeling and evolution analysis in online social network based on emergency events [X. Liu, D. He, and C. Liu]

https://ieeexplore.ieee.org/document/8613016

States that "A nonlinear dynamic emergency public event information diffusion system and mathematical model for public events are proposed based on the propagation dynamics. First, public diffusion for public emergency information communication is analyzed and designed, the opinion evolution is divided into and the viewpoint of value, influence, interest, conformity, intimacy five factors of information emergencies; second, the dynamic diffusion network is designed; information propagation mathematical public emergencies the final model is constructed; the proposed model and social reality and the true statistics of empirical experiments are simulated and analyzed. The experimental results show that the model and the real emergency public event propagation process are consistent, the development trend can predict public events, and the proposed mathematical model is reasonable and effective ".

[4] Dynamic stability of an SIS epidemic network and its optimal control [K. Li, G. Zhu, Z. Ma, and L. Chen]

https://www.sciencedirect.com/science/article/abs/pii/S1007570418301977

States that "Develop a complex network based SIS model, calculate the threshold R0 of infectious disease transmission and analyze the stability of the model. In the model, three control measures including isolation and vaccination are considered, where the isolation is structured in isolation of susceptible nodes and the isolation of infected nodes. Regard these three kinds of controls as time-varying variables, and obtain the existence and the solution of the optimal control by using the optimal control theory. With regard to the stability of the model, sensitivity analysis of the parameters and optimal control, carry out numerical simulations. From the simulation results, it is

obvious that when the three kinds of controls exist simultaneously, the scale and cost of the disease are minimal. Finally, fit the real data of COVID-19 to the numerical solution of the model ".

[5] Viral cascade probability estimation and maximization in diffusion networks [A. Sepehr and H. Beigy]

https://www.computer.org/csdl/journal/tk/2019/03/08367882/17D45WXIkH9

States that " People use social networks to share millions of stories every day, but these stories rarely become viral. Can estimate the probability that a story becomes a viral cascade If so, can find a set of users that are more likely to trigger viral cascades These estimation and maximization problems are very challenging since both rare-event nature of viral cascades and efficiency requirement should be considered. Unfortunately, this problem still remains largely unexplored to date. Given temporal dynamics of a network, first develop an efficient viral cascade probability estimation method, VICE, that leverages an special importance sampling approximation to achieve high accuracy, even in the cases of very small probability of influence. Then show that selection the most influential nodes in model is NP-hard, and develop an efficient viral cascade probability maximization method, VICEM, that maximizes a surrogate submodular function using a greedy algorithm. Experiments on both synthetic and real world data show that VICE can accurately estimate viral cascade probabilities using fewer samples than naive sampling by at least two orders of magnitude, and also VICEM finds a set of users with higher viral cascade probability than alternatives. Additionally, experiments show that these algorithms are robust across different network topologies ".

[6] Adversarial influence maximization [J. Khim, V. Jog, and P. Loh]

https://www.ijcai.org/proceedings/2020/594

States that "Consider the problem of influence maximization in fixed networks for contagion models in an adversarial setting. The goal is to select an optimal set of nodes to seed the influence process, such that the number of influenced nodes at the conclusion of the campaign is as large as possible. Formulate the problem as a repeated game between a player and adversary, where the adversary specifies the edges along which the contagion may spread, and the player chooses sets of nodes to influence in

an online fashion. Establish upper and lower bounds on the minimax pseudo-regret in both undirected and directed networks ".

[7] Bistability and resurgent epidemics in reinfection models [R. Pagliara, B. Dey, and N. E. Leonard]

https://www.semanticscholar.org/paper/Bistability-and-Resurgent-Epidemics-in-Reinfection-Pagliara-Dey/d3d3735811e90fd7abd4e32d72a8c5019cb77a88

States that "An epidemic model with heterogeneous susceptibility which generalizes the SIS (susceptible– infected–susceptible), SIR (susceptible–infected–recovered) and SIRI (susceptible–infected–recovered–infected) models. The proposed model considers the case that some infected people are susceptible again after recovery, some infected people develop immunity after infection, and some infected people are reinfected after recovery. Perform a comprehensive theoretical analysis of the model, showing that under appropriate initial conditions, delayed outbreak phenomenon occurs that can give people false impressions. Moreover, compared with the SIRI model, the proposed model exists the delayed outbreak phenomenon under more probable conditions. Finally, present a numerical example to illustrate the effectiveness of the theoretical results ".

[8] Learning multiple factors-aware diffusion models in social networks [C.-K. Chou and M.-S. Chen]

https://www.researchgate.net/publication/322015861_Learning_Multiple_Factors-Aware_Diffusion_Models_in_Social_Networks

States that "Information diffusion is a natural phenomenon occurring in social networks. The adoption behavior of a node toward an information piece in a social network can be affected by different factors, e.g. freshness and hotness. Previously, many diffusion models are proposed to consider one or several fixed factors. In fact, the factors affecting adoption decision of a node are different from one to another and may not be seen before. For a different scenario of diffusion with new factors, previous diffusion models may not model the diffusion well, or are not applicable at all. Moreover, uncertainty of information exposure intrinsically exists between two connected nodes, which causes modeling diffusion more challenge in social networks. In work, the aim is to design a diffusion model in which factors considered are flexible

to be extended and changed and the uncertainly of information exposure is explicitly tackled. Therefore, with different factors, diffusion model can be adapted to more scenarios of diffusion without requiring the modification of the learning framework. Conduct comprehensive experiments to show that diffusion model is effective on two important tasks of information diffusion, namely activation prediction and spread estimation".

[9] Network utility maximization in adversarial environments [Q. Liang and E. Modiano]

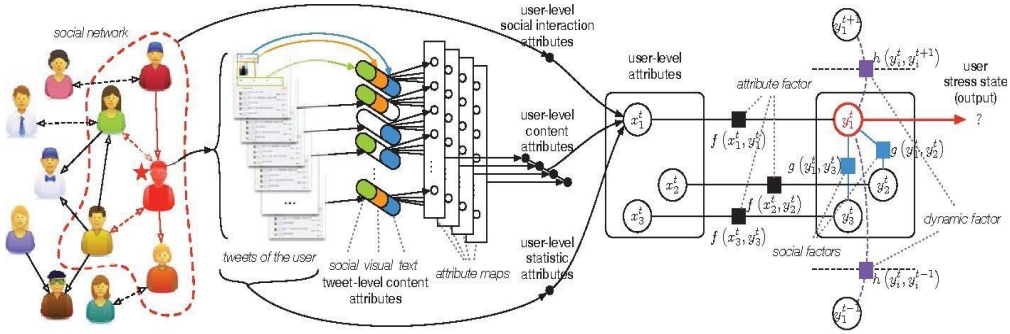
https://arxiv.org/abs/1712.08672

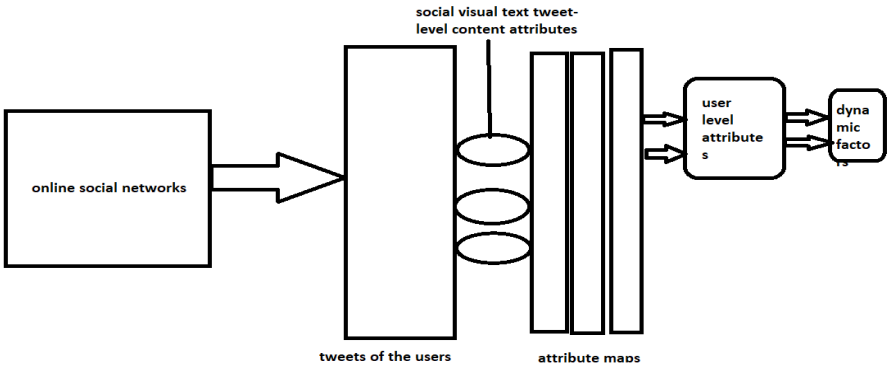
States that "Network Utility Maximization (NUM) studies the problems of allocating traffic rates to network users in order to maximize the users' total utility subject to network resource constraints. In propose a new NUM framework, Learning-NUM, where the users' utility functions are unknown apriori and the utility function values of the traffic rates can be observed only after the corresponding traffic is delivered to the destination, which means that the utility feedback experiences \textit{queueing delay}. Without the presence of feedback delay, Design an algorithm based on the ideas of gradient estimation and Max-Weight scheduling. To handle the feedback delay, embed the algorithm in a parallel-instance paradigm to form a policy that achieves $\tilde{O}(T^{3/4})$-regret, i.e., the difference between the expected utility obtained by the best dynamic policy and policy is in $\tilde{O}(T^{3/4})$. Finally, to demonstrate the practical applicability of the Learning-NUM framework, apply it to three application scenarios including database query, job scheduling and video streaming. Further conduct simulations on the job scheduling application to evaluate the empirical performance of our policy ".

CHAPTER-3: SYSTEM DESIGN

3.1 System Structures

3.1 Block Diagram





Social Network : Where users can interact with each other on social media. Social media platforms may be Facebook, Twitter, Instagram and so on. Where users can post their daily life content through pics or videos.

Tweets of the user : here people can share their opinion on the post, those opinions can either be positive or negative.

User level Attributes : Whenever users tweet to a post, those tweets can be filtered by user level attributes that may be positive or negative.

After filtering the tweets that can be represented as :

- If the tweets are negative then it is represented as red in color.
- If the tweets are positive then it is represented as blue/voilet in color.

3.2 UML DIAGRAMS

UML stands for Unified Modeling Language. UML is a standardized general-purpose modeling language in the field of object-oriented software engineering. The standard is managed, and was created by, the Object Management Group. The goal is for UML to become a common language for creating models of object oriented computer software. In its current form UML is comprised of two major components: a Meta-model and a notation. In the future, some form of method or process may also be added to; or associated with, UML.

The Unified Modeling Language is a standard language for specifying, Visualization, Constructing and documenting the artifacts of software system, as well as for business modeling and other non-software systems.

The UML represents a collection of best engineering practices that have proven successful in the modeling of large and complex systems.

The UML is a very important part of developing objects oriented software and the software development process. The UML uses mostly graphical notations to express the design of software projects.

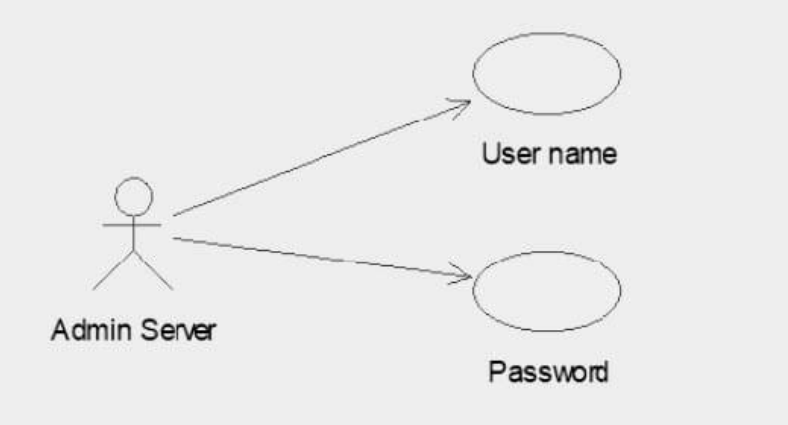
Goals:

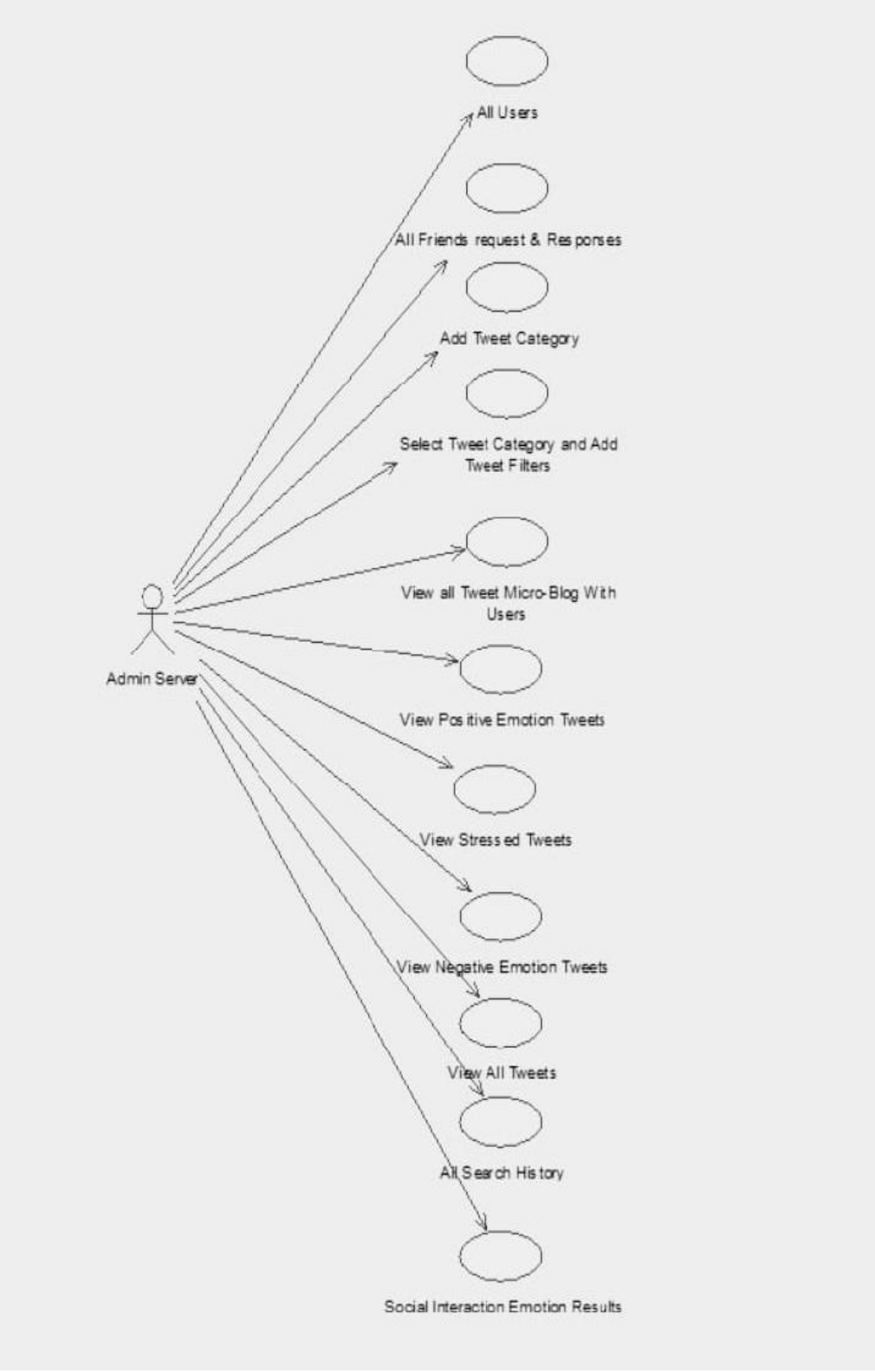
The Primary goals in the design of the UML are as follows:

1. Provide users a ready-to-use, expressive visual modeling Language so that they can develop and exchange meaningful models.
2. Provide extendibility and specialization mechanisms to extend the core concepts.
3. Be independent of particular programming languages and development process.
4. Provide a formal basis for understanding the modeling language.
5. Encourage the growth of OO tools market.
6. Support higher level development concepts such as collaborations, frameworks, patterns and components.
7. Integrate best practices.

3.2.1 USE CASE DIAGRAM:

A use case diagram in the Unified Modeling Language (UML) is a type of behavioral diagram defined by and created from a Use-case analysis. Its purpose is to present a graphical overview of the functionality provided by a system in terms of actors, their goals (represented as use cases), and any dependencies between those use cases. The main purpose of a use case diagram is to show what system functions are performed for which actor. Roles of the actors in the system can be depicted.





3.2.1:- USE CASE DIAGRAM

3.2.2 CLASS DIAGRAM:

In software engineering, a class diagram in the Unified Modeling Language (UML) is a type of static structure diagram that describes the structure of a system by showing the system's classes, their attributes, operations (or methods), and the relationships among the classes. It explains which class contains information.

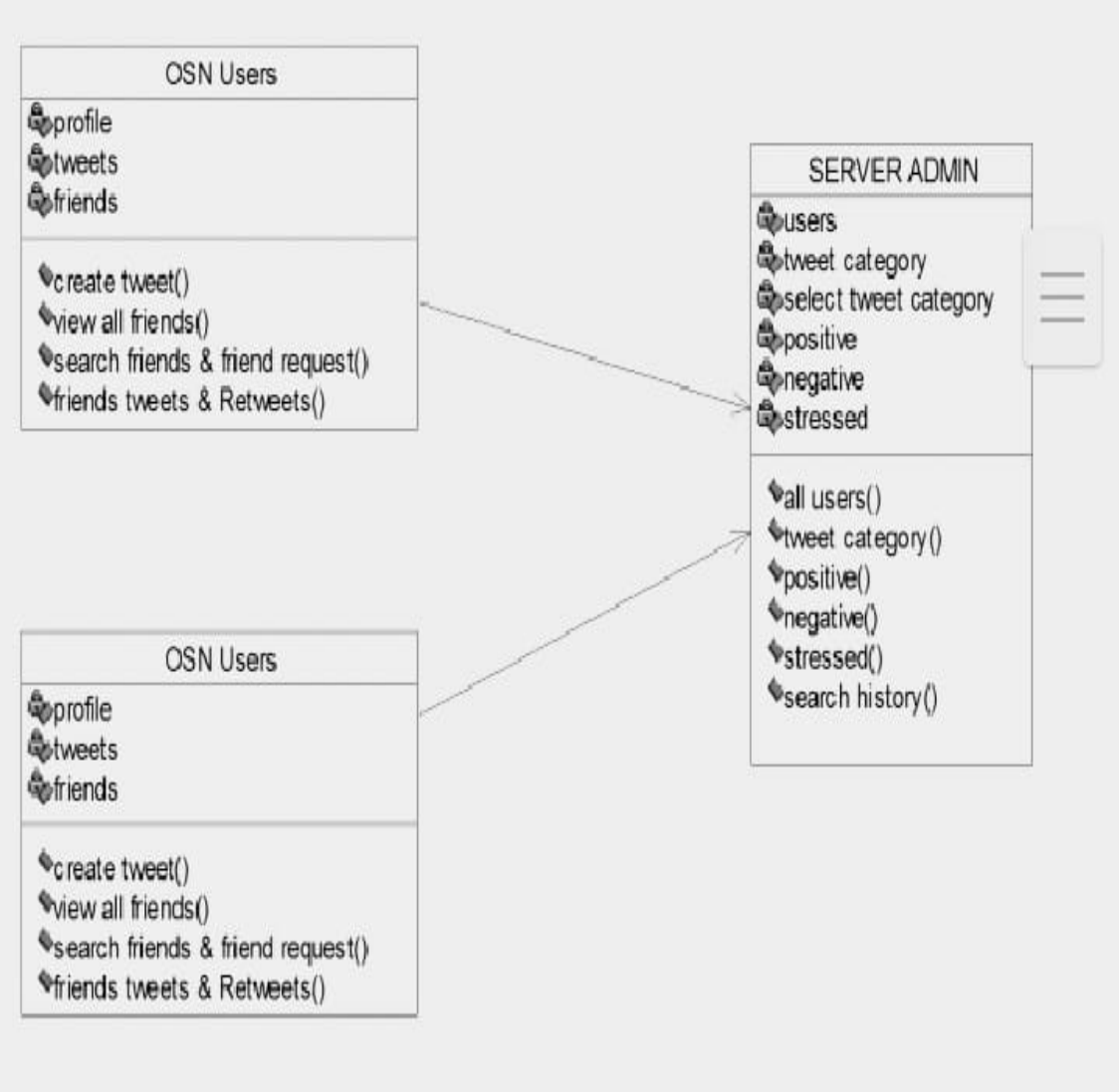


Fig 3.2.2 : CLASS DIAGRAM

3.2.3 SEQUENCE DIAGRAM:

A sequence diagram in Unified Modeling Language (UML) is a kind of inter-Action diagram that shows how processes operate with one another and in what order. It is a construct of a Message Sequence Chart. Sequence diagrams are sometimes called event diagrams, event scenarios, and timing diagrams.

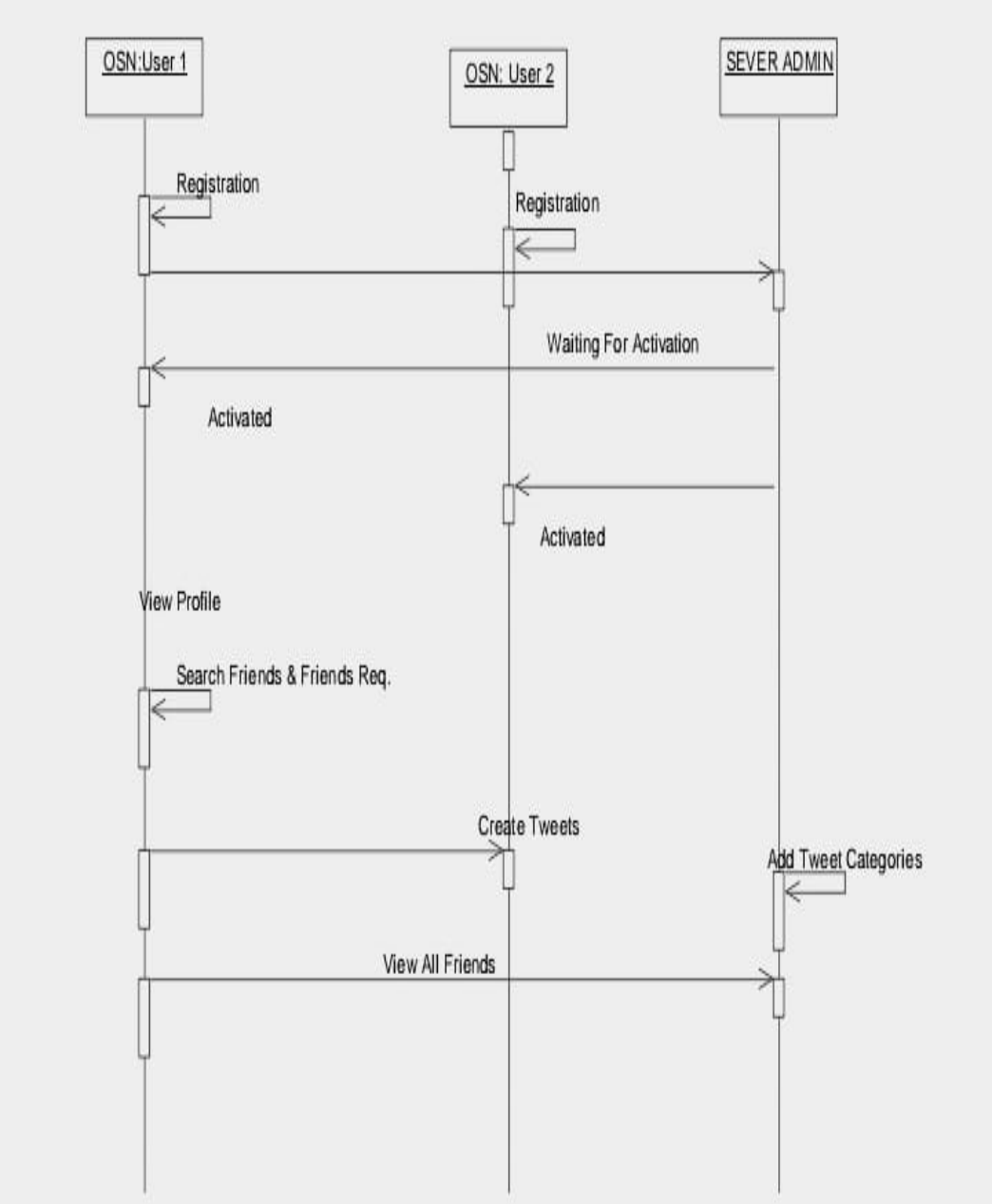


Fig 3.5 : SEQUENCE DIAGRAM

3.2.5 ACTIVITY DIAGRAM

Activity diagrams are graphical representations of workflows of stepwise activities and actions with support for choice, iteration and concurrency. In the Unified Modeling Language, activity diagrams can be used to describe the business and operational step-by-step workflows of components in a system.

An activity diagram shows the overall flow of control.

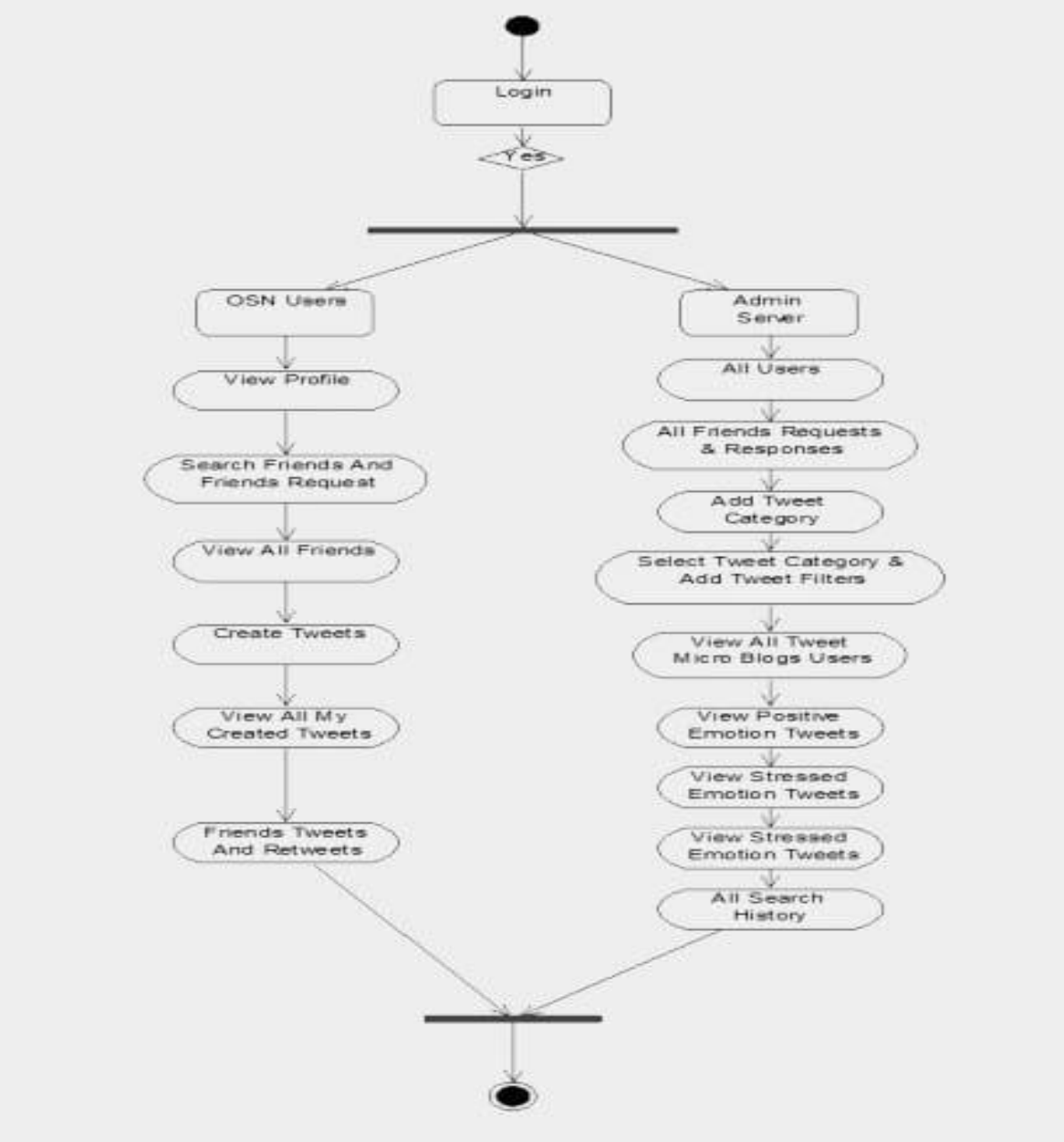


Fig 3.7 : ACTIVITY DIAGRAM

3.3 SYSTEM REQUIREMENTS:

3.3.1 SOFTWARE REQUIREMENTS:

Operating System	:	Windows 11
Technology	:	java JDK 1.7 , HTML
Database	:	MySql 5.5
Server	:	Tomcat 7.0
IDE	:	Ecllipse/Netbeans 7.2

3.3.2 HARDWARE REQUIREMENTS:

Hardware	:	Pentium IV
Speed	:	2.4 GHz
RAM	:	8GB
Hard Disk	:	256 GB

CHAPTER-4: INPUT AND OUTPUT DESIGN

4.1 Input Design

The input design is the link between the information system and the user. It comprises the developing specification and procedures for data preparation and those steps are necessary to put transaction data in to a usable form for processing can be achieved by inspecting the computer to read data from a written or printed document or it can occur by having people keying the data directly into the system. The design of input focuses on controlling the amount of input required, controlling the errors, avoiding delay, avoiding extra steps and keeping the process simple. The input is designed in such a way so that it provides security and ease of use with retaining the privacy.

Input Design considered the following things:

- What data should be given as input?
- How the data should be arranged or coded?
- The dialog to guide the operating personnel in providing input.
- Methods for preparing input validations and steps to follow when error occur.

OBJECTIVES

1.Input Design is the process of converting a user-oriented description of the input into a computer-based system. Design is important to avoid errors in the data input process and show the correct direction to the management for getting correct information from the computerized system.

2.It is achieved by creating user-friendly screens for the data entry to handle large volume of data. The goal of des igning input is to make data entry easier and to be free from errors. The data entry screen is designed in such a way that all the data manipulates can be performed. It also provides record viewing facilities.

When the data is entered it will check for its validity. Data can be entered with the help of screens. Appropriate messages are provided as when needed so that the

user will not maize of instant. Thus the objective of input design is to create an input layout that is easy to follow.

4.2 Output Design

A quality output is one, which meets the requirements of the end user and presents the information clearly. In any system results of processing are communicated to the users and to other system through outputs. In output design it is determined how the information is to be displaced for immediate need and also the hard copy output. It is the most important and direct source information to the user. Efficient and intelligent output design improves the system's relationship to help user decision-making.

1. Designing computer output should proceed in an organized, well thought out manner; the right output must be developed while ensuring that each output element is designed so that people will find the system can use easily and effectively. When analysis design computer output, they should Identify the specific output that is needed to meet the requirements.

2.Select methods for presenting information.

3.Create document, report, or other formats that contain information produced by the system.

The output form of an information system should accomplish one or more of the following objectives.

- Convey information about past activities, current status or projections of the
- Future.
- Signal important events, opportunities, problems, or warnings.
- Trigger an action.
- Confirm an action.

CHAPTER-5: SOFTWARE ENVIRONMENT

5.1. Client Server

Two prominent systems in existence are client server and file server systems. It is essential to distinguish between client servers and file server systems. Both provide shared network access to data but the comparison dens there! The file server simply provides a remote disk drive that can be accessed by LAN applications on a file by file basis. The client server offers full relational database services such as SQL-Access, Record modifying, Insert, Delete with full relational integrity backup/ restore performance for high volume of transactions, etc. the client server middleware provides a flexible interface between client and server, who does what, when and to whom.

Front end or User Interface Design

The entire user interface is planned to be developed in browser specific environment with a touch of Intranet - Based Architecture for achieving the Distributed Concept. The browser specific components are designed by using the HTML standards , and the dynamism of the designed by concentrating on the constructs of the Java Server Pages.

Features of the language used : Java language is chosen for developing the code.

5.1.1 JAVA

Initially the language was called as “oak” but it was renamed as “Java” in 1995. The primary motivation of this language was the need for a platform- independent (i.e., architecture neutral) language that could be used to create software to be embedded in various consumer electronic devices.

- Java is a programmer’s language.
- Java is cohesive and consistent.
- Except for those constraints imposed by the Internet environment, Java gives the programmer, full control.

Finally java is Internet programming where C was to system programming.

Importance of java to the internet

Java has had a profound effect on the Internet. This is because; Java expands the Universe of objects that can move about freely in Cyberspace. In a network, two categories of objects are transmitted between the Server and the Personal computer. They are : Passive information and Dynamic active programs. The Dynamic, Self-executing the programs cause serious problems in the areas of Security and probability. But, Java addresses those concerns and by doing so, has opened the door to an exciting new form of program called the Applet.

Java can be used to create two types of programs

Applications and Applets : An application is a program that runs on our Computer under the operating system of that computer. It is more or less like one creating using C or C++. Java's ability to create Applets makes it it important. An Applet is an application designed to be transmitted over the Internet and executed by a Java –compatible web browser. An applet is the actually a tiny Java program, dynamically downloading across the network, just like an image. But the difference is, it is an intelligent program, not just a media file. It can react to the user input and dynamically change.

Features of Java

Security

Every time you that you download a "normal" program, you are risking a viral infection. Prior to Java, most users did not download executable programs frequently, and those who did scanned them for viruses prior to execution. Most users still worried about the possibility of infecting their systems with a virus. In addition, another type of malicious program exists that must be guarded against. This type of program can gather private information, such as credit card numbers, bank account balances, and passwords. Java answers both these concerns by providing a "firewall" between a network application and your computer.

Portability

For programs to be dynamically downloaded to all the various types of platforms connected to the Internet, some means of generating portable executable code is needed The same mechanism that helps ensure security also helps create portability. Indeed, Java's solution to these two problems is both elegant and efficient.

The Byte code

The key that allows the Java to solve the security and portability problems is that the output of Java compiler is Byte code. Byte code is a highly optimized set of instructions designed to be executed by the Java run-time system, which is called the Java Virtual Machine (JVM). That is, in its standard form, the JVM is an interpreter for byte code.

Java, Virtual Machine (JVM)

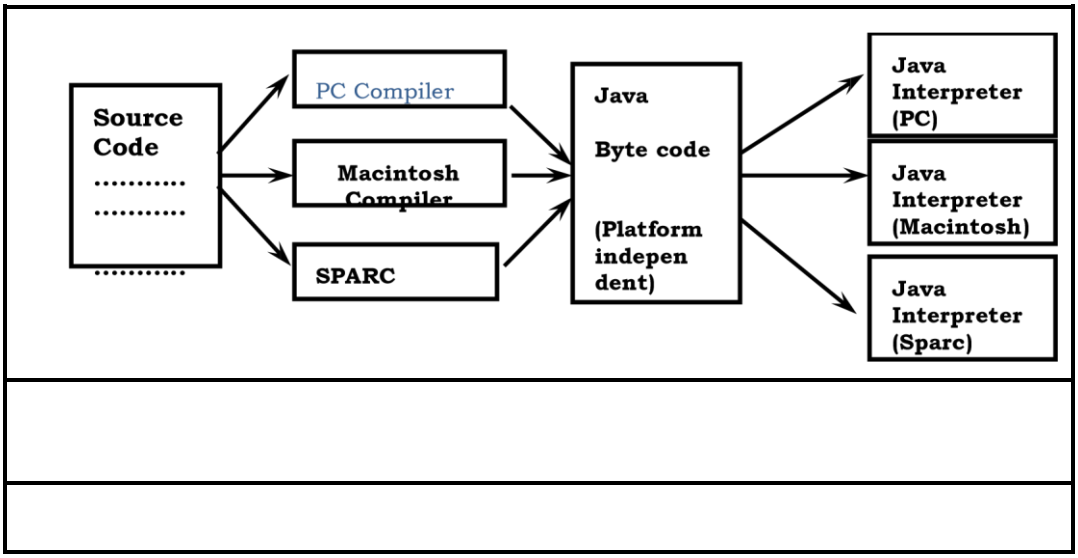
Beyond the language, there is the Java virtual machine. The Java virtual machine is an important element of the Java technology. The virtual machine can be embedded within a web browser or an operation system. Once a piece of Java code is loaded onto a machine, it is verified. Byte code verification takes place at the end of the compilation process to make sure that is all accurate and correct. So byte code verification is integral to the compiling and executing of Java code.

Java Architecture

Java architecture provides a portable, robust, high performing environment for development Java provides portability by compiling the byte codes for the Java Virtual Machine, which is then interpreted on each platform by the sruntime environment. Java is a dynamic system, able to load code when needed from a machine in the same room or across the planet.

Compilation of code

When you compile the code, the Java compiler creates machine code (called byte code) for a hypothetical machine called Java Virtual Machine (JVM).



JVM is supposed to execute the byte code. The JVM is created for overcoming the issue of portability. The code is written and compiled for one machine and interpreted on all machines. This machine is called Java Virtual Machine.

Compiling and interpreting Java Source Code

Compiling and interpreting Java Source Code

During run-time the Java interpreter tricks the byte code file into thinking that it is running on a Java Virtual Machine. In reality this could be a Intel Pentium Windows 95 or Sun SARC (station running Solaris or Apple) Macintosh running system and all could receive code from any computer through Internet and run the Applets.

Simple

Java was designed to be easy for the Professional programmer to learn and to use effectively. If you are an experienced C++ programmer, learning Java will be even easier. Because Java inherits the C/C++ syntax and many of the object-oriented features of C++. Most of the confusing concepts from C++ are either left out of Java or implemented in a cleaner, more approachable manner. In Java there are a small number of clearly defined ways to accomplish a given task.

Object-Oriented

Java was not designed to be source - code compatible with any other language. This allowed the Java team the freedom to design with a blank slate. One out – come of this was a clean usable, pragmatic approach to objects. The object model in Java is simple and easy to extend, while simple types, such as integers, are kept as high-performance non-objects.

Robust

The multi-platform environment of the Web places extraordinary demands on a program, because the program must execute reliably in a variety of systems. The ability to create robust programs was given a high priority in the design of Java. Java is strictly typed language; it checks your code at compile time and run time. Java virtually eliminates the problems of memory management and deallocation, which is completely automatic. In a wellwritten Java program, all run time errors can –and should –be managed by your program.

5.1.2 JAVASCRIPT

JavaScript is a script-based programming language that was developed by Netscape Communication Corporation. JavaScript was originally called Live Script and renamed as JavaScript to indicate its relationship with Java. JavaScript supports the development of both client and server components of Web-based applications. On the client side, it can be used to write programs that are executed by a Web browser within the context of a Web page. On the server side, it can be used to write Web server programs that can process information submitted by a Web browser and then updates the browser's display accordingly Even though JavaScript supports both client and server Web programming, prefer JavaScript at Client side programming since most of the browsers supports it. JavaScript is almost as easy to learn as HTML, and JavaScript statements can be included in HTML documents by enclosing the statements between a pair of scripting tags.

<SCRIPTS>..</SCRIPT>.

<SCRIPT LANGUAGE = "JavaScript">

JavaScript statements

</SCRIPT>

Here are a few things can do with JavaScript :

- Validate the contents of a form and make calculations.
- Add scrolling or changing messages to the Browser's status line.
- Animate images or rotate images that change when move the mouse over them.
- Detect the browser in use and display different content for different browsers.
- Detect installed plug-ins and notify the user if a plug-in is required.

Can do much more with JavaScript, including creating entire application.

JavaScript vs Java

JavaScript and Java are entirely different languages. A few of the most glaring differences are:

- Java applets are generally displayed in a box within the web document; JavaScript can affect any part of the Web document itself.
- While JavaScript is best suited to simple applications and adding interactive features to Web pages; Java can be used for incredibly complex applications.

There are many other differences but the important thing to remember is that JavaScript and Java are separate languages. They are both useful for different things; in fact they can be used together to combine their advantages.

Advantages:

- JavaScript can be used for Sever-side and Client-side scripting.
- It is more flexible than VBScript.
- JavaScript is the default scripting languages at Client-side since all the browsers supports it.

5.2 Hyper Text Markup Language

Hypertext Markup Language (HTML), the languages of the World Wide Web (WWW), allows users to produces Web pages that include text, graphics and pointer to other Web pages (Hyperlinks).HTML is not a programming language but it is an application of ISO Standard 8879 , SGML (Standard Generalized Markup

Language) , but specialized to hypertext and adapted to the Web. The idea behind Hypertext is that instead of reading text in rigid linear structure, can easily jump from one point to another point. Can navigate through the information based on our interest and preference. HTML can be used to display any type of document on the host computer, which can be geographically at a different location. It is a versatile language and can be used on any platform or desktop.

HTML provides tags (special codes) to make the document look attractive. HTML tags are not case-sensitive. Using graphics, fonts, different sizes, color, etc., can enhance the presentation of the document. Anything that is not a tag is part of the document itself.

Basic HTML Tags :

<!-- -->	Specifies comments
<A>…….</A>	Creates hypertext links
<B>…….</B>	Formats text as bold
<BIG>…….</BIG>	Formats text in large font.
<BODY>…</BODY>	Contains all tags and text in the HTML document
<CENTER>...</CENTER>	Creates text
<DD>…</DD>	Definition of a term
<DL>...</DL>	Creates definition list
<FONT>…</FONT>	Formats text with a particular font
<FORM>...</FORM>	Encloses a fill-out form
<FRAME>...</FRAME>	Defines a particular frame in a set of frames
<H#>…</H#>	Creates headings of different levels
<HEAD>...</HEAD>	Contains tags that specify information about a document
<HR>...</HR>	Creates a horizontal rule
<HTML>…</HTML>	Contains all other HTML tags
<META>...</META>	Provides meta-information about a document
<SCRIPT>…</SCRIPT>	Contains client-side or server-side script
<TABLE>…</TABLE>	Creates a table
<TD>…</TD>	Indicates table data in a table

<TR>…</TR> Designates a table row

<TH>…</TH> Creates a heading in a table

ADVANTAGES

- A HTML document is small and hence easy to send over the net.
  It is small because it does not include formatted information.
- HTML is platform independent.
- HTML tags are not case-sensitive.

5.3 Java Database Connectivity

What Is JDBC?

JDBC is a Java API for executing SQL statements. (As a point of interest, JDBC is a trademarked name and is not an acronym; nevertheless, JDBC is often thought of as standing for Java Database Connectivity. It consists of a set of classes and interfaces written in the Java programming language. JDBC provides a standard API for tool/database developers and makes it possible to write database applications using a pure Java API.

Using JDBC, it is easy to send SQL statements to virtually any relational database. On can writ e a single program using the JDBC API, and the program will be able to send SQL statements to the appropriate database.

What Does JDBC Do?

Simply put, JDBC makes it possible to do three things:

- Establish a connection with a database
- Send SQL statements Process the results.

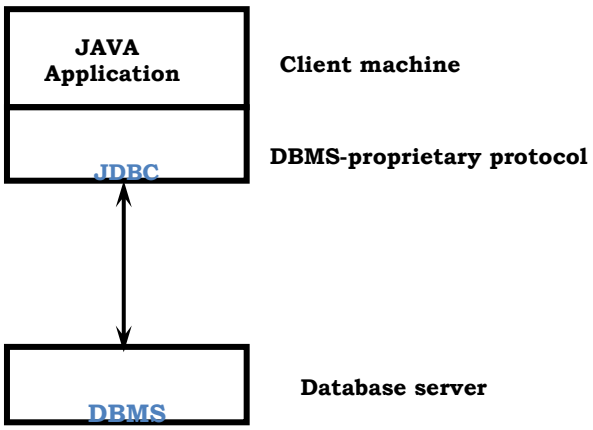
JDBC versus ODBC and other APIs

Microsoft's ODBC (Open Database Connectivity) API is that probably the most widely used programming interface for accessing relational databases. It offers the ability to connect to almost all databases on almost all platforms. So why not just use ODBC from Java ? The answer is that you can use ODBC from Java, but this is

best done with the help of JDBC in the form of the JDBC-ODBC Bridge, which will cover shortly .The question now becomes "Why do you need JDBC?" There are several answers to this question:

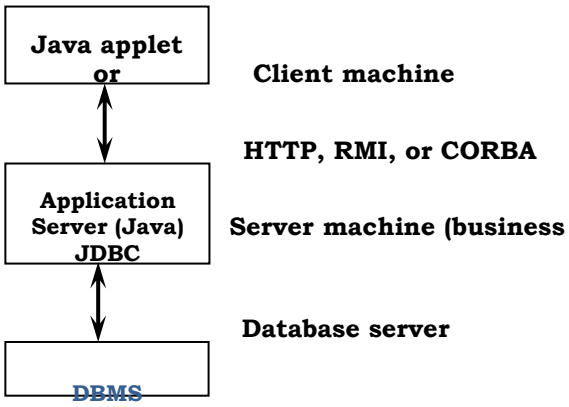
1. ODBC is not appropriate for direct use from Java because it uses a C interface. Calls from Java to native C code have a number of drawbacks in the security, implementation, robustness, and automatic portability of applications.
2. A literal translation of the ODBC C API into a Java API would not be desirable. For example, Java has no pointers, and ODBC makes copious use of them, including the notoriously error-prone generic pointer "void *". You can think of JDBC as ODBC translated into an object-oriented interface that is natural for Java programmers.
3. ODBC is hard to learn. It mixes simple and advanced features together, and it has complex options even for simple queries. JDBC, on the other hand, was designed to keep simple things simple while allowing more advanced capabilities where required.

Two-tier and Three-tier Models : The JDBC API supports both two-tier and three-tier models for database access. In the two - tier model, a Java



applet or application talks directly to the database. This requires a JDBC driver that can communicate with the particular database management system being accessed. A user's SQL statements are delivered to the database , and the results of those statements are sent back to the user. The database may be located on another machine to which the user is connected via a network. This is referred to as a client/server configuration, with the user's machine as the client, and the machine housing the database as the server. The network can be an Intranet, which, for example, connects employees within a corporation, or it can be the Internet.

In the three-tier model, commands are sent to a "middle tier" of services, which then send SQL statements to the database. The database processes the SQL statements and sends the results back to the middle tier, which then sends them to the user. MIS directors find the three-tier model very attractive



DBMS-proprietary

Until now the middle tier has typically been written in languages such as C Or C++, which offer fast performance. However, with the introduction of optimizing compilers that translate Java byte code into efficient machine- specific code , it is becoming practical to implement the middle tier in Java. This is a big plus, making it possible to take advantage of Java's robustness, multithreading, and security features. JDBC is important to allow database access from a Java middle tier.

JDBC Driver Types

The JDBC drivers that are aware of at this time fit into one of four categories:

- JDBC-ODBC bridge plus ODBC driver
- Native-API partly-Java driver
- JDBC-Net pure Java driver
- Native-protocol pure Java driver

JDBC-ODBC Bridge

If possible, use a Pure Java JDBC driver instead of the Bridge and an ODBC driver. This completely eliminates the client configuration required by ODBC. It also eliminates the potential that the Java VM could be corrupted by an error in the native

code brought in by the Bridge (that is, the Bridge native library, the ODBC driver manager library, the ODBC driver library, and the database client library).

5.4 Java Server Pages (JSP)

Java server Pages is a simple, yet powerful technology for creating and maintaining dynamic-content web pages. Based on the Java programming language, Java Server Pages offers proven portability, open standards, and a mature re-usable component model .The Java Server Pages architecture enables the separation of content generation from content presentation. This separation not eases maintenance headaches, it also allows web team members to focus on their areas of expertise. Now, web page designer can concentrate on layout, and web application designers on programming, with minimal concern about impacting each other's work.

JDBC connectivity

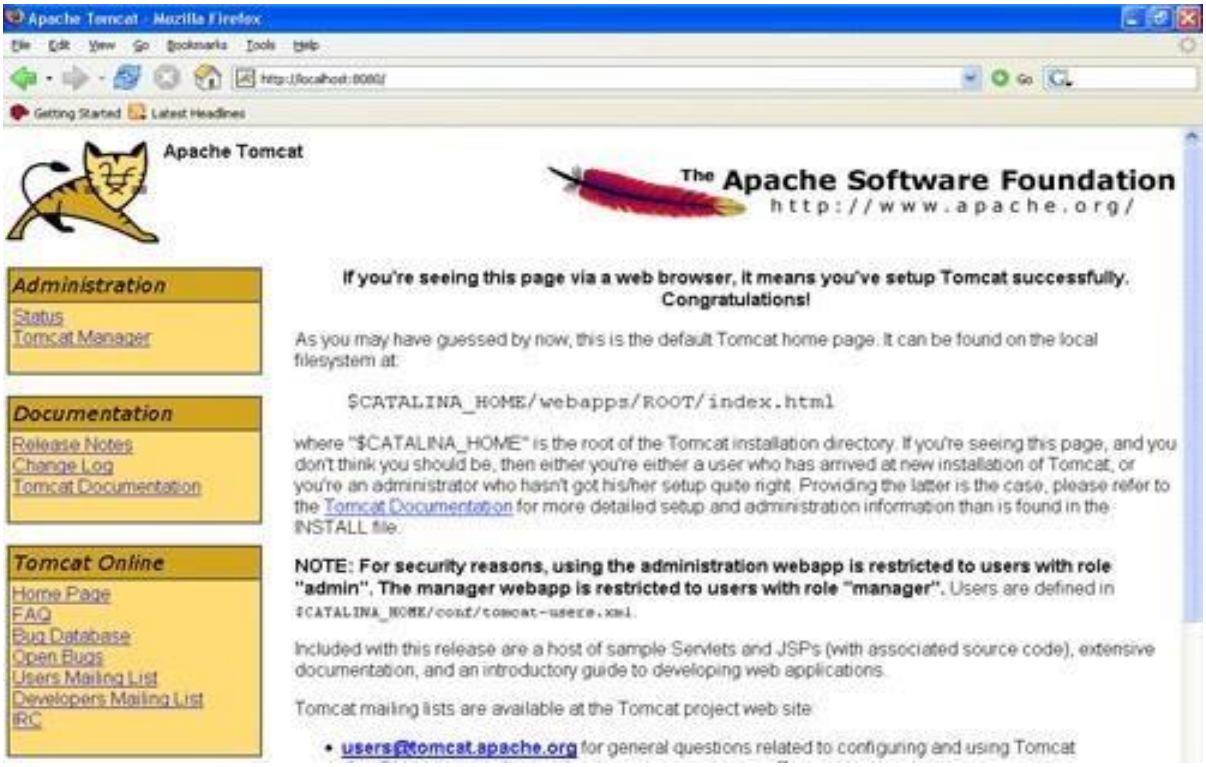
The JDBC provides database-independent connectivity between the J2EE platform and a wide range of tabular data sources. JDBC technology allows an Application Component Provider to:

- Perform connection and authentication to a database server
- Manager transactions
- Move SQL statements to a database engine for preprocessing and execution
- Execute stored procedures
- Inspect and modify the results from Select statements.

5.5 Tomcat 6.0 web server

Tomcat is an open source web server developed by Apache Group. Apache Tomcat is the servlet container that is used in the official Reference Implementation for the Java Servlet and Java Server Pages technologies. The Java Servlet and Java Server Pages specifications are developed by Sun under the Java Community Process. Web

Servers like Apache Tomcat support only web components while an application server supports web components as well as business components (BEAs Web logic, is one of the popular application server).To develop a web application with jsp/servlet install any web server like J Run, Tomcat etc to run your application.


Apache Tomcat - Mozilla Firefox
File Edit View Go Bookmarks Tools Help
http://localhost:8080/
Getting Started Latest Headlines
Apache Tomcat
The Apache Software Foundation
http://www.apache.org/
Administration
Status
Tomcat Manager
Documentation
Release Notes
Change Log
Tomcat Documentation
Tomcat Online
Home Page
FAQ
Bug Database
Open Bugs
Users Mailing List
Developers Mailing List
IRC
If you're seeing this page via a web browser, it means you've setup Tomcat successfully. Congratulations!
As you may have guessed by now, this is the default Tomcat home page. It can be found on the local filesystem at:
$CATALINA_HOME/webapps/ROOT/index.html
where "$CATALINA_HOME" is the root of the Tomcat installation directory. If you're seeing this page, and you don't think you should be, then either you're either a user who has arrived at new installation of Tomcat, or you're an administrator who hasn't got his/her setup quite right. Providing the latter is the case, please refer to the Tomcat Documentation for more detailed setup and administration information than is found in the INSTALL file.
NOTE: For security reasons, using the administration webapp is restricted to users with role "admin". The manager webapp is restricted to users with role "manager". Users are defined in $CATALINA_HOME/conf/tomcat-users.xml.
Included with this release are a host of sample Servlets and JSPs (with associated source code), extensive documentation, and an introductory guide to developing web applications.
Tomcat mailing lists are available at the Tomcat project web site:
users@tomcat.apache.org for general questions related to configuring and using Tomcat

CHAPTER-6: SYSTEM STUDY

PRELIMINARY INVESTIGATION

The first and foremost strategy for development of a project starts from the thought of designing a mail enabled platform for a small firm in which it is easy and convenient of sending and receiving messages, there is a search engine, address book and also including some entertaining games. When it is approved by the organization and our project guide the first activity, ie. preliminary investigation begins. The activity has three parts:

- **Request Clarification**
- **Feasibility Study**
- **Request Approval**

6.1 REQUEST CLARIFICATION

After the approval of the request to the organization and project guide, with an investigation being considered, the project request must be examined to determine precisely what the system requires.

Here our project is basically meant for users within the company whose systems can be interconnected by the Local Area Network(LAN). In today's busy schedule man need everything should be provided in a readymade manner. So taking into consideration of the vastly use of the net in day to day life, the corresponding development of the portal came into existence.

6.2 FEASIBILITY STUDY

An important outcome of preliminary investigation is the determination that the system request is feasible. This is possible only if it is feasible within limited resource and time. The different feasibilities that have to be analyzed are

1.Operational Feasibility

2.Economic Feasibility

3.Technical Feasibility

6.2.1 Operational Feasibility

Operational Feasibility deals with the study of prospects of the system to be developed. System operationally eliminates all the tensions of the Admin and helps him in effectively tracking the project progress. Kind of automation will surely reduce the time and energy, which previously consumed in manual work. Based on the study, the system is proved to be operationally feasible.

6.2.2 Economic Feasibility

Economic Feasibility or Cost-benefit is an assessment of the economic justification for a computer based project. As hardware was installed from the beginning & for lots of purposes thus the cost on project of hardware is low. Since the system is a network based, any number of employees connected to the LAN within that organization can use tool from at anytime. The Virtual Private Network is to be developed using the existing resources of the organization. So the project is economically feasible.

6.2.3 Technical Feasibility

According to Roger S. Pressman, Technical feasibility is the assessment of The technical resources of the organization. The organization needs IBM compatible machines with a graphical web browser connected to the Internet and Intranet. The system is developed for platform Independent environment. Java Server Pages, JavaScript, HTML, SQL server and WebLogic Server are used to develop the system. The technical feasibility has been carried out. The system is technically feasible for development and can be developed with the existing facility.

6.3 REQUEST APPROVAL

Not all request projects are desirable or feasible. Some organization receives so many project requests from client users that only few of them are pursued. However, those projects that are both feasible and desirable should be put into schedule. After a project request is approved, it cost, priority, completion time and personnel requirement is estimated and used to determine where to add it to any project list. Truly speaking, the approval of those above factors, development works can be launched.

CHAPTER-7: SYSTEM TESTING

7.1 TYPES OF TESTS

7.1.1 Unit testing

Unit testing involves the design of test cases that validate that the internal program logic is functioning properly, and that program inputs produce valid outputs. All decision branches and internal code flow should be validated. It is the testing of individual software units of the application .it is done after the completion of an individual unit before integration. This is a structural testing, that relies on knowledge of its construction and is invasive. Unit tests perform basic tests at component level and test a specific business process, application, and/or system configuration. Unit tests ensure that each unique path of a business process performs accurately to the documented specifications and contains clearly defined inputs and expected results.

7.1.2 Integration testing

Integration tests are designed to test integrated software components to determine if they actually run as one program. Testing is event driven and is more concerned with the basic outcome of screens or fields. Integration tests demonstrate that although the components were individually satisfaction, as shown by successfully unit testing, the combination of components is correct and consistent. Integration testing is specifically aimed at exposing the problems that arise from the combination of components.

7.1.3 Functional testing

Functional tests provide systematic demonstrations that functions tested are available as specified by the business and technical requirements, system documentation, and user manuals.

Functional testing is centered on the following items:

Valid Input : identified classes of valid input must be accepted.
Invalid Input : identified classes of invalid input must be rejected.

Functions : identified functions must be exercised.

Output : identified classes of application outputs must be exercised.

Systems/Procedures interfacing systems or procedures must be invoked. Organization and preparation of functional tests is focused on requirements, key functions, or special test cases. In addition, systematic coverage pertaining to identify Business process flows; data fields, predefined processes, and successive processes must be considered for testing. Before functional testing is complete, additional tests are identified and the effective value of current tests is determined.

7.1.4 System Test

System testing ensures that the entire integrated software system meets requirements. It tests a configuration to ensure known and predictable results. An example of system testing is the configuration oriented system integration test. System testing is based on process descriptions and flows, emphasizing pre-driven process links and integration points.

7.1.5 Acceptance Testing

User Acceptance Testing is a critical phase of any project and requires significant participation by the end user. It also ensures that the system meets the functional requirements.

Test Results: All the test cases mentioned above passed successfully. No defects encountered.

CHAPTER-8: RESULTS

Home Page

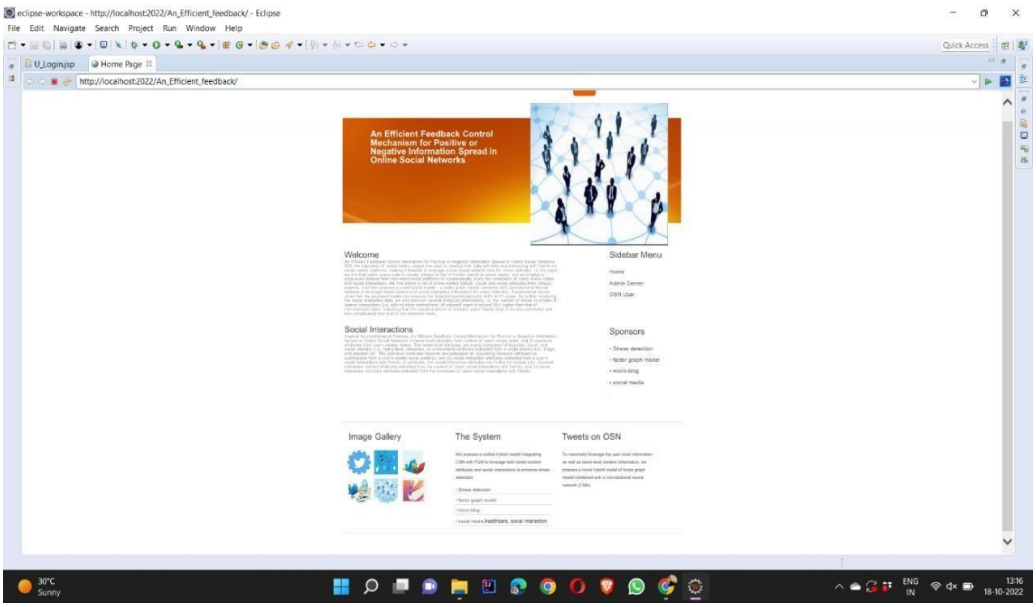


Fig 8.1 : Screenshot of result(1)

Admin Server

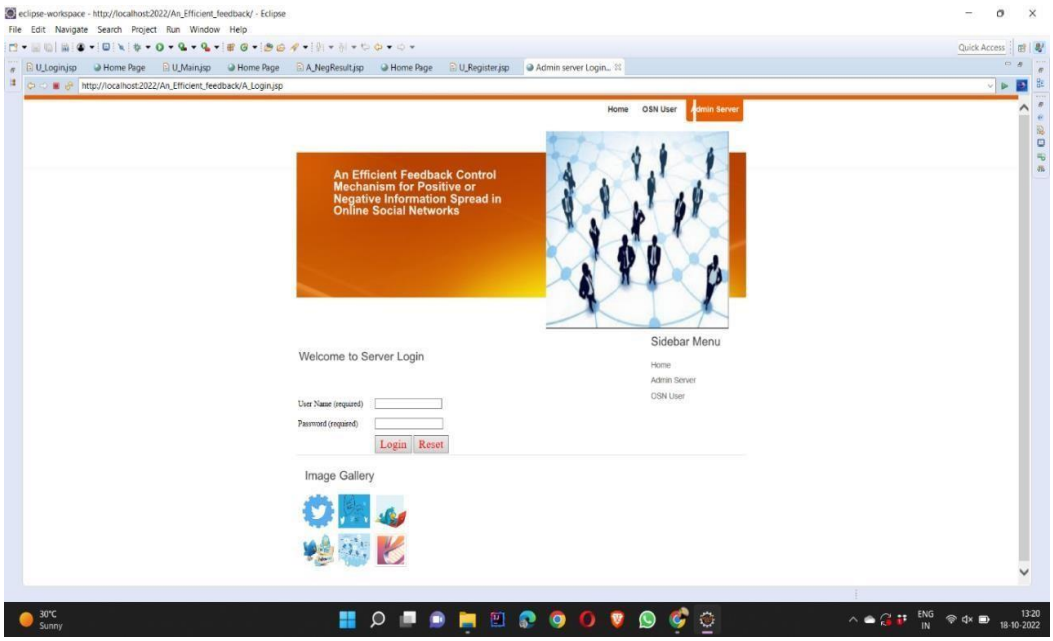


Fig 8.2 : Screenshot of result(2)

OSN User Login Page

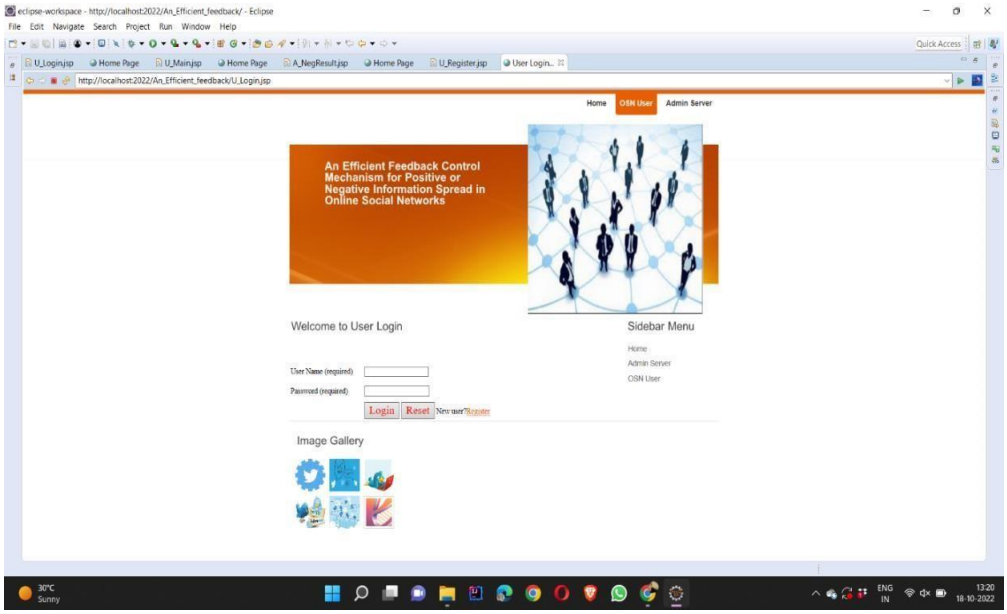


Fig 8.3 : Screenshot of result(3)

Registration page

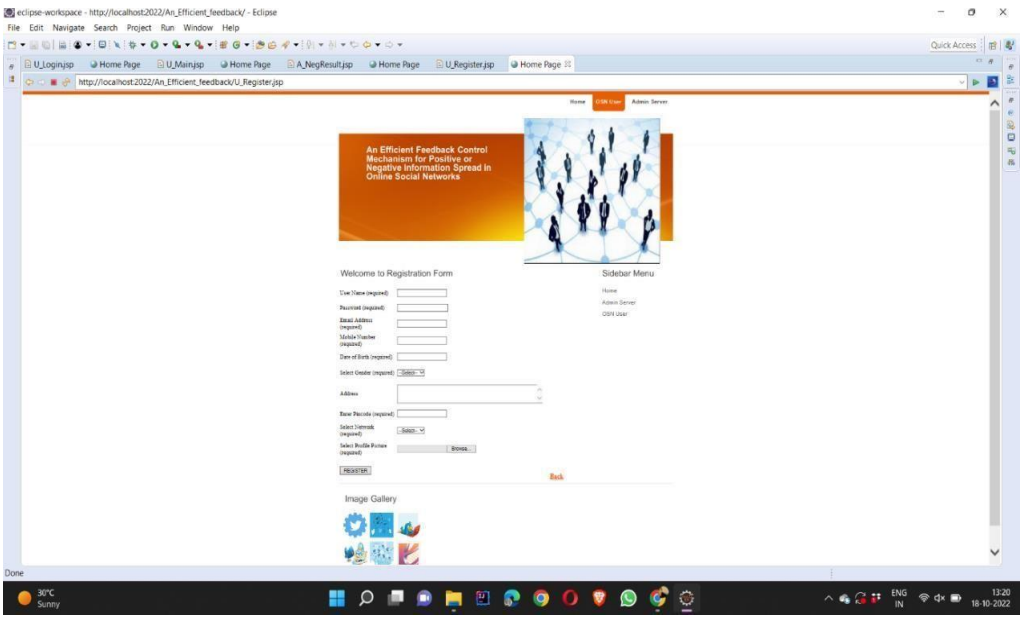


Fig 8.4 : Screenshot of result(4)

Server Menu

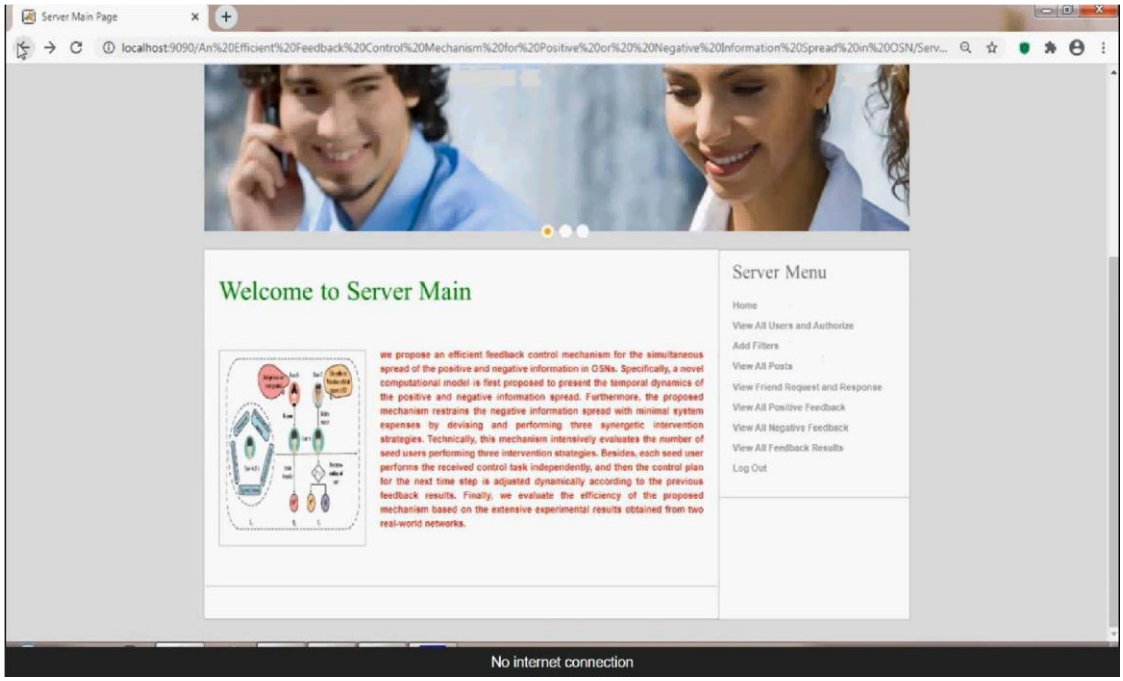


Fig 8.5 : Screenshot of result(5)

Authorized users by Admin

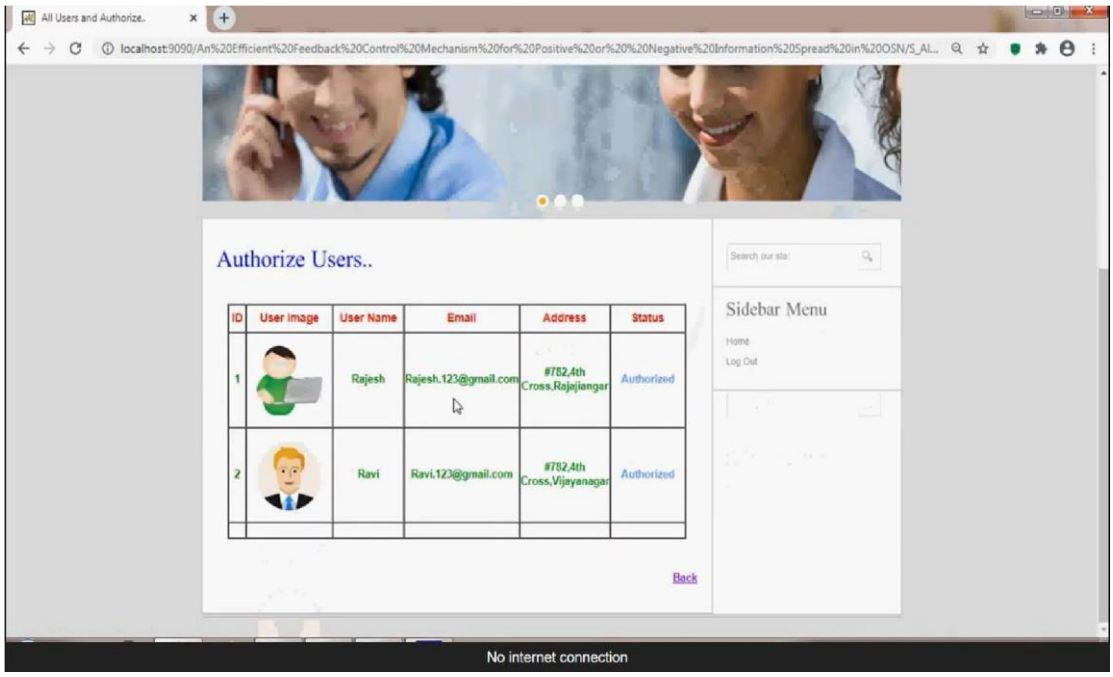


Fig 8.6 : Screenshot of result(6)

Filter Words

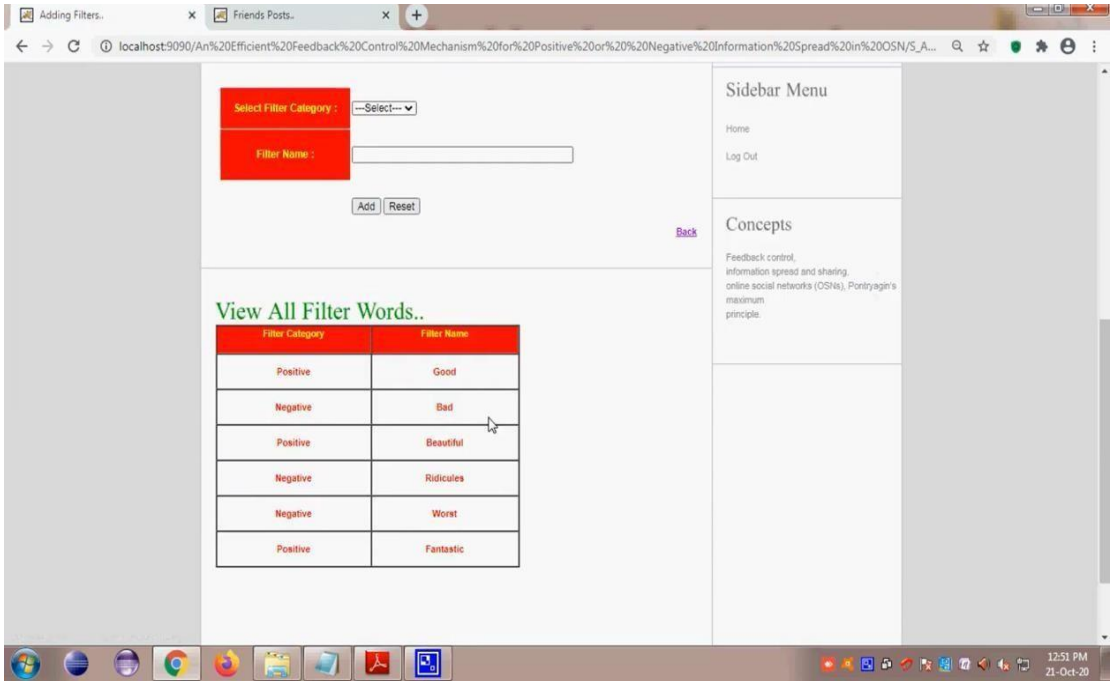


Fig 8.7 : Screenshot of result(7)

All Positive Feedback

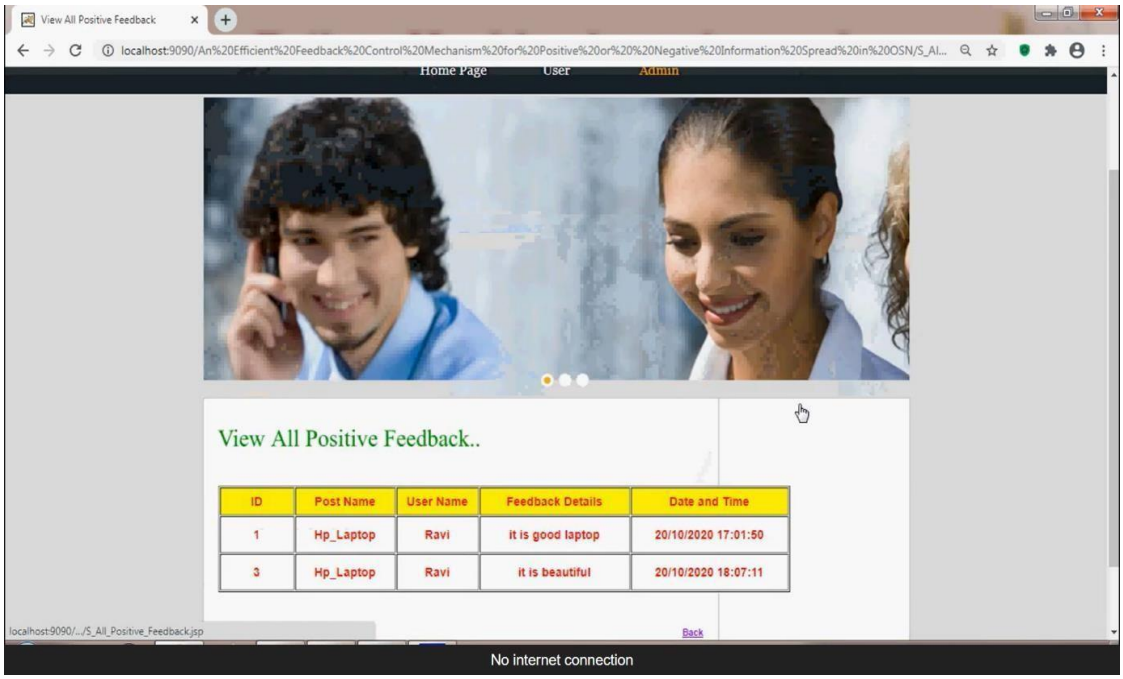


Fig 8.8 : Screenshot of result(8)

All Negative Feedback

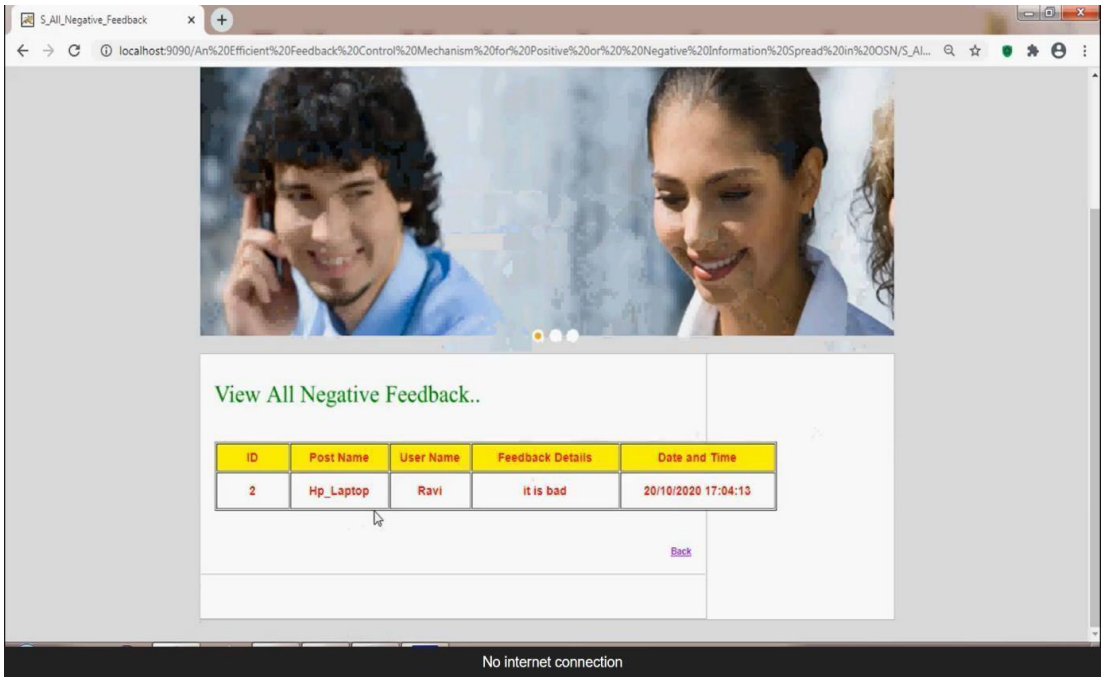


Fig 8.9 : Screenshot of result(9)

All Feedback on Posts

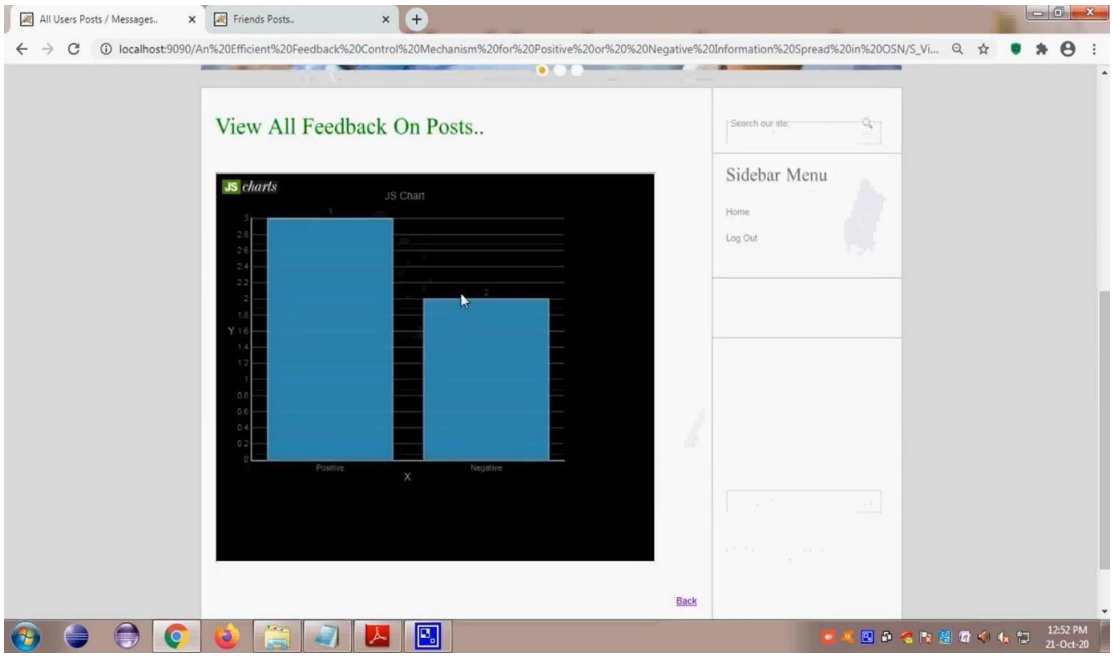


Fig 8.10 : Screenshot of result(10)

CHAPTER-9: CONCLUSION & FUTURE ENHANCEMENT

Conclusion

The problem of the coupling spread of the positive and negative information in OSNs. First, have established a coupling spread model of the positive and negative information to describe the dynamic coupling spread process. In addition, have proposed three synergetic control strategies to control the coupling spread process of positive and negative information. Afterward, have devised an NFCM to perform three synergetic control strategies with minimal system expenses. The experimental results demonstrate that proposed NFCM can effectively decrease the spread of negative information. Future directions include the investigation of the network topology and node property on the spread process of positive and negative information. Then, intended to employ the idea of crowd sourcing to design a distributed control algorithm to intervene in the coupling spread of the positive and negative information.

Future Enhancement

In signed social networks, there exist positive or negative relationships between individuals. In particular, negative links play a more critical role than positive ones, since they can reverse the influence. How to take advantage of different relations to effectively select influential nodes is a key issue in influence maximization for signed networks. Work, model problem as positive influence maximization in signed networks in the IC model. To avoid the process of simulating use the method.

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