ONLINE TRADING ENGINE

PROJECT WORK DONE AT
COCHIN STOCK EXCHANGE, COCHIN.

PROJECT REPORT

SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE AWARD OF THE DEGREE OF

MASTER OF COMPUTER APPLICATIONS

OF BAHARATHIAR UNIVERSITY, COIMBATORE.

SUBMITTED BY

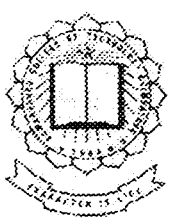
ANISH M.A
Reg. No: 9838M0498

Internal Guide

Mr.M.RAJU, M.C.A, B.Ed
Lecturer, Dept. of Comp.Science
Kumaraguru College of Technology, Coimbatore

External Guide

Mr.ANTONY K.J , M.C.A
Cochin Stock Exchange
Cochin



Department of Computer Science and Engineering
KUMARAGURU COLLEGE OF TECHNOLOGY
Coimbatore – 641 006
MAY 2001

CERTIFICATE

This is to certify that the project work entitled

ONLINE TRADING ENGINE

Submitted to the

Department of Computer Science and Engineering

Kumaraguru College of Technology

in partial fulfillment of the requirements for the award of the degree of Master of Computer applications is a record of original work done by **Mr. ANISH M.A, Reg. No. 9838M0498** during his period of study in the Department of Computer Science and Engineering, Kumaraguru College of Technology, Coimbatore under my supervision and this project work has not formed the basis of award of any Degree/Diploma Associateship/Fellowship or similar title to any candidate of any University.

Professor and Head

Staff-in-charge

Submitted to University Examination held on 11/5/01

Internal Examiner

External Examiner

COCHIN STOCK EXCHANGE LTD.

36/1565, 4TH FLOOR, MES BUILDINGS, JUDGES AVENUE
KALOOR, COCHIN - 682 017

PHONE : 401898, 401712
FAX : 0484-400330
E-mail : netin cse@md3.vsnl.net.i

Ref: SE/SYS/14/2001

March 31, 2001

WHOMSOEVER IT MAY CONCERN

This is to certify that **Mr. ANISH M.A.,** Final year **M.C.A** of Kumaraguru College of Technology, Coimbatore, Tamilnadu, has undergone Project work on **ONLINE TRADING ENGINE** developed for **COCHIN STOCK EXCHANGE LTD, COCHIN** from December ,2000 to April, 2001.This project was carried out successfully under my guidance and supervision.

His punctuality, behavior, conduct and progress in training were **VERY GOOD** as rated by the department.

Due to confidentiality of this concern , the student is not permitted to take the source code outside the organization.

Vimala

(VIMALAMMA KURIAKOSE)
Project Manager

COCHIN STOCK EXCHANGE LTD.
MES BUILDING
4th FLOOR
JUDGES AVENUE
KALOOR
COCHIN - 682 017

DECLARATION

I hereby declare that the project entitled **'ONLINE TRADING ENGINE'** for Cochin Stock Exchange-Cochin, submitted to **Kumaraguru college of technology coimbatore** affiliated to **Bharathiar University** as the project work of **Master of Computer Applications Degree**, is a record of original work done by me under the supervision and guidance of **Mr.ANTONY K.J,M.C.A Programmer,Cochin Stock Exchange,Cochin** and **Mr.M.RAJU,M.C.A,B.Ed Lecturer, Kumaraguru College of Technology, Coimbatore** and this project work has not found the basis for the award of any Degree/Diploma/ Associateship/Fellowship or similar title to any candidate of any university.

Signature of candidate

(ANISH M.A)

Place: Coimbatore

Date: ೨೦/೪/೨೦೦೧ .

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I thank God Almighty for all his blessings

With great pleasure, I sincerely thank a number of people who have provided understanding and assistance in this effort.

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With Profound gratitude, I sincerely thank **Mrs. Vimalamma Kuriakose** (general manager-systems) of Cochin Stock Exchange (CSE) and **Mr. Antony.k.j** (project leader, CSE) for allowing me to do the project work at this prestigious organization. My sincere gratitude and thanks to **Ms. Haizal** (programmer, CSE) for his constant help and valuable guidance through out the project work

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ANISH M.A

SYNOPSIS

Cochin Stock Exchange is one of the best Stock Exchanges in India. Now, CSE's aim is to provide facility for **Internet trading**, an inevitable development of the exchange. For that, they need to develop a trading interface, which should satisfy the interest and security of the Internet users.

Now, CSE has an Intranet with its offices and online Intranet trading facility also. The implementation of the developed system provides an **online and flash news facility**. So that any trader can get in touch with the **current share value** and he/she is able to take decision to sell/buy his/her shares. With the **flash news facility** he/she gets in touch with the **CSE's current trading schedule**. The broker can get into his page through the **login option** in the system. He/she will get share's closing and opening **index value** through the search facility. The user can view the pending details through net. He /She can modify the pending details with proper options.

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1. INTRODUCTION

1.1 PROJECT OVERVIEW

Cochin Stock Exchange is the first Stock Exchange in kerala which implemented the trading through online. At present it is in an Intranet. Now CSE (Cochin Stock Exchange) needs to develop a website, which provides the online index of the shares. The broker should be able to acess the trade engine anywhere in the world.

The website of the CSE provides all the above mentioned functionalities. This is a web-based application and will be hosted in the Internet. The software facilities online updation of the share values automatically. It is also help the brokers, sub brokers or internet users to search the particular value of share using the company name or scripcode of the share or with the code number. The users are able to view the flash news regarding CSE or trading.

FEATURES OF NEW SYSTEM

- The system provides online index.
- The CSE can broadcast flash news and thereby CSE can have a proper communication with its users about its activities.
- The user can search the details of a share.
- The broker can get into the trading engine.
- System will provide necessary security for the brokers.
- The current rate of any scrip can view.

1.2 ORGANIZATION PROFILE.

CSE (Cochin Stock Exchange) is the first stock exchange in Kerala recognized by SEBI (Securities and Exchange Board of India). CSE started its operations in the year 1978 with 14 members and now it has 507 members. CSE has the credit of being the first Stock Exchange in India, which has computerized its entire operations in 1987 and started the on-line trading system. Today CSE is equipped with the most modern breed of computers and programs to do on-line trading known as COLT (CSE on-line Trading) which is going to linked to the Internet for Web based trading.

A stock exchange is a place where the legal transactions of shares takes place. In India there are altogether twenty-three stock exchanges. Cochin Stock Exchange Ltd is one among them. It is a public limited company, which provides shares to the public. Cochin Stock Exchange having a board of thirteen members in CSE for the smooth functioning. One among them will be the Executive Director. Six of them are elected members, six from retired financial officers, educational officers etc. from the public. These members help in the transactions of stock exchange and they have their corresponding commissions. The brokers, in order to promote transactions provide sub-brokers and authorized system assistants.

Stock market provides a market place for the purchase and sale of securities evincing the ownership of business property of a business debt. The origin of stock market therefore, goes back to the time when promises to pay were first

issued and made transferable from one person to another. The stock exchanges operate under the rules by laws and regulations approved by the govt and they form a an organized capital market for securities issued by the central and state govt, public bodies and joint stock companies.

OVERALL GROWTH

Cochin Stock Exchange Ltd was incorporated in the year 1978 with 14 members over the years. CSE has got the highest number of lady members and professionals in India. CSE is the fourth largest stock exchange in india. It is the first stock exchange to computerized stock trading system and to implement online trade capture system. CSE has made phenomenal growth in daily trade volume also. Trading volume was 10 lakhs of rupees in the early eighties and during 1997, it has reached Rs 10 crores, even at the bottam time. CSE is the one of the most spacious tarding floors in india. CSE became the premier stock exchane in India in computerizing the entire tading operations.

CSE probes all ingradients of a perfect cash namely fast payoff, guranteed delivery, exchange managed clearing system and the best delivery system. The advaced concepts like marketing to the market, delivery versus payment, advanced cash margin, member or investor access system etc, are available only at the CSE Ltd.

ONLINE ENVIRONMENT

By the April 1990, for the first time in India, an enhanced online trade capturing system (OLTP) was introduced in Cochin Stock Exchange. The entry procedure runs as a parallel activity to tarding. It starts and ends with the tarding session and various slip. Monitoring includes advance margins of the buyer or the seller, status of the scrip, scrip rate avriation. Accumulated position and total volume of each member on various scrips are also restricted. The transaction gets in case the member or the scrip fails to satisfy any of the above parameters.

2. SYSTEM STUDY AND ANALYSIS

2.1 EXISTING SYSTEM

Cochin Stock Exchange is the first stock exchange in kerala which implemented the trading through online. At present it is in an Intranet. Now CSE needs to develop a website, which provides the online index of the shares. The broker should be able to access the trade engine anywhere in the world.

SYSTEM STUDY : A system is a set of components that interact each other to bring out a common objective.In the system analysis phase of a project the existing system is thoroughly evaluated. At this time all the drawbacks of the existing system is brought to light and suggestions are made to improve the system.

In Cochin Stock Exchange, the analysis carried out on the current system is...

IDENTIFY THE DRAWBACKS OF THE CURRENT SYSTEM.

- Identify the need for change
- Carry out feasibility study
- Identify the system requirements

NEED FOR THE CHANGE

A step by step analysis carries out the following facts.

- The current site is nothing but a static one
- As a static site it has got some limitation
- It doesn't contain dynamic utilities like online index, flash news, login facility etc
- For an organization like stock exchange all these things are a must to enter the new era of internet trading

2.2 Proposed system

The proposed system is designed to overcome the problems in the old system. Some of the features added are as follows.

- The new system(site) contains a lot of dynamic properties
- It is designed to be very friendly to the user using it.
- The user interfaces provides smooth navigation through out.
- The system is very flexible for enhancements.
- The administrators are provided with options to control the system

FEASIBILITY STUDY

After the initial evaluation, the feasibility study is conducted. It is conducted to check whether the proposed system is feasible or not. There are three levels of feasibility.

TECHNICAL FEASIBILITY

Technical feasibility means how much the current available technical resources can be enhanced in order to support the proposed system. In CSE the new system is easily maintained as the operating system windows NT, the jdk1.3 kit, the jsdk2.0 kit, the Java webserver2.0 kit and the IE browser were available and all these stuff are available free of cost. So there is no need of technical enhancement is needed there.

FINANCIAL FEASIBILITY

A new software product must be financially feasible. As no new resources are needed the software is financially feasible. Later to maintain the software also no cost is needed. To host the site to the net there will be some expense but it is affordable for CSE.

OPERATIONAL FEASIBILITY

The operation of this software is very simple. By starting any Internet browser and giving the pages address it will be displayed in the screen. Once entered in the site it's very user friendly to navigate through.

2.3 REQUIREMENTS OF NEW SYSTEM

FUNCTIONAL REQUIREMENTS.

To satisfy the functional requirements the user should have a registered user. The user should have a login name and password.

INTRODUCTION.

Every broker in the CSE should have a login name and password. After the validation he can trade through CSE and will be getting a report about his trading. At the end of every trading ~~cycle~~ a ~~trade summary of all~~ ~~transa~~ctions and report on the net positions called 'final allocation' is also ~~provided to~~ all traders. The valid user can enter their trading details in the fast entry section. If the broker need any kind of protection means he can put the orders in the stop loss section. If any one needs batch trade he can put the orders in batch entry section. All these facilities will be available after validation. The Broker can view the online index value. Broker can view the closing rate of the company for the last trade. Each broker should have a login name and password. The members can view if there are any flash news. In addition to this Broker's can see the company details by inputting the scrip code, scrip name, and scrip number. Apart from the trading facility users can view the history and functioning of CSE.

LIST OF INPUTS.

1 username

2 password

3 scrip code

4 scrip name

5 scrip number

6 flash news

7 order type

8 flag(b/s)

9 quantity

10 price

11 retention

12 trader code

13 protection

14 order-number

15 client-id

INFORMATION PROCESSING REQUIRED.

For the information processing the following steps are needed

- Enter the login name
- Enter the password.
- After validation, user should have 4 options, they are

  Fast entry

  Stop loss

  Batch entry

  Pending.

- If the user wants to buy or sell any shares he/she can put the order details in fast entry screen. Any broker needs any protection order should be in stop loss. If any user needs trading in batches the order should be in batch entry.

- If prices of both buy and sell orders are equals then trading will occur.
- The trading for a settlement cycle starts on every Monday and ends on Fridays.
- Broker can view their pending details using pending in the main option.
- Broker can view the company details by entering scrip code, scrip name, scrip number.

PERFORMENCE REQUIREMENTS.

SECURITY.

The online trading engine is highly secure. Only valid users can enter for trading. Others can view the other details like history, functioning, company details from this site. A simulated system crash is carried out to check whether how the system responds in such situations. Again invalid data and input is given to detect the error detection capabilities.

AVAILABILITY.

All the requirements needed for the proper functioning of the system is available.

CAPACITY

The purpose of this is to check the system provides a fairly well response time for a large amount of data over a short period of time. It is also checked and verified.

RESPONSE TIME.

The system must have a response time that must be acceptable to the user. When a particular request is given the user expects the response in a time period and a good system should satisfy the need. In the system developed here the response time is fairly well. The execution speed can be enhanced Java's most praised utility called multithreading.

2.4 User Characteristics

There are basically three types of users identified

- System administrator.
- Registered members in CSE as a broker
- Users of the internet.

The system administrator is also an end user who is assigned the added responsibility maintaining the integrity of the database and sending news. He /She should be proficient in database and its administration related activities. The brokers are the registered members an the valid users of the system. They are allowed to sell and buy the shares through the Internet. They can also update the stoploss screen according to their wish.

The end user can get the information about CSE and its activities. They can view the values of shares and search for the closing index and opening index of a particular share if they know the name of the company or scrip code or code number of the share.

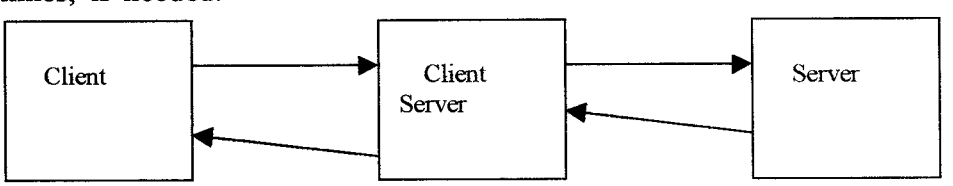
3. PROGRAMMING ENVIRONMENT

CLIENT-SERVER ARCHITECTURE

A client/server network consists of a group of user-oriented PCs (called clients) that issue requests to a server. The client PC is responsible for issuing requests for services to be rendered. The server's function on the network is to service these requests. Servers generally are high performance systems that are optimized to provide network services to other PCs. The server machine often has a faster CPU, more memory, and more disk space than a typical client machine. Some examples of client/server-based networks are Novell NetWare, Windows NT server etc. Some common server types include file servers, mail servers, fax servers, and application servers. In a client/server network , the server machine often are not even set to do the tasks that a client machine do.

THE BASIC FEATURES OF CLIENT/SERVER MODEL

Clients and servers are functional modules with well-defined interfaces (I.e., they hide internal information). The functions performed by a client and a server can be implemented by a set of software modules, hardware components, or a combination thereof. Clients and /servers may run on dedicated machines, if needed.



1. Each client/server relationship is established between two functional modules when one module (client) initiates a service request and the other (server) chooses to respond to the service request. Examples of service requests are "retrieve customer name", "produce net income in last year", etc. For a given service request, clients are servers do not reverse roles (i.e., a client stays a client and a server stays a server). However, a server for device Request R1 may become a client for Service Request R2 when it issues requests to another server. For example, a client may issue an Service Request that may generate other Service Requests.

2. Information's exchange between clients and servers is strictly through messages (i.e., no information is exchanged through global variables). The service request and additional information is placed into a message that sent to the server. The server's response is similarly another message that is sent back to the client. This is an extremely crucial feature of C/S model.

The following additional features, although not required, are typical of a client/server model

1. Clients and servers typically reside on separate machines connected through a network. Conceptually, clients and servers may run on the same machine or on separate machines. In a *distributed client/server systems* clients and servers reside on separate machines. The implication of the last two features is that C/S service

requests are real time messages that are exchanged through network services. This feature increases the appeal of the C/S model (i.e., flexibility, scalability) but introduces several technical issues such as portability, interoperability, security, and performance.

2. Browsers and web servers use the client/server architecture with the Hypertext Transfer Protocol (HTTP). The client process (browser) requests a document from the server with a simple mouse click or keystroke, and the server returns the document for display by the browser. Behind the scenes, a client/server returns the document for display by the browser.

Internet and Intranet applications mostly follow three-tier server model. The browser (client) is responsible for handling the presentation logic that is defined by HTML documents and this may include script logic and software components. The Web Server is located on the middle tier and is used to distribute client logic and integrate client sessions using CGI/ISPI extensions. Transaction processing Monitors (TPM) can be used to assist the various tasks of handling large complex database applications.The database occupies the top tie the data store

3.1 HARDWARE CONFIGURATION

The hardware and peripheral configurations used for the project are listed below.

SERVER CONFIGURATION

PROCESSOR : Intel Pentium

RAM :128 MB

HDD :10 GB

CD-DRIVE :24 x

FDD :1.44MB

Monitor :Siemens

CLIENT

PROCESSOR : Intel Pentium

RAM :32 MB

HDD : 1 GB

FDD :1.44MB

MONITOR :Siemens

ORACLE SERVER

PROCESSOR : Intel Pentium III

RAM :256 MB

SCSI HDD :9.6 GB(4.3*2)

CD-drive :40 x

FDD :1.44MB

CACHE :512KB

MONITOR :Siemens

3.2 SOFTWARE CONFIGURATION

Server:

OPERATING SYSTEM : Windows NT 4.0

WEB SERVER :Java Web Server 2.0

DATABASE : Oracle 8

PROGRAMMING LANGUAGE : Java Servlets

CLIENT

OPERATING SYSTEM : Windows NT 4.0

PROGRAMMING LANGUAGE : Hyper Text markup Language

SCRIPTING LANGUAGE : Java Script

OVERVIEW OF SOFTWARE

HTML

HTML stands for Hyper Text Markup Language. Hypertext is ordinary text that has been dressed up with extra features, such as formatting, images, ultimedia, and links to other documents. Markup is the process of taking ordinary text and adding extra symbols. HTML has its own syntax, slang, and rules for proper communication. Markup languages are a special type of computer language because

they are solely concerned with classifying the parts of a document according to their functions.

The main goal of HTML is to be a universal language for classifying the function of different sections of a document. It is used to define the different part of your document is a title, which part of your document is an address, and so forth. HTML is neither a page–layout language nor a printing language. The only thing HTML does is classifying parts of your document to be displayed on many different kind of platform.

ADVANTAGES OF HTML

- Flexibility.
- Platform independence.
- Deeper understanding about a page.
- Troubleshooting is easy.
- Easy to learn

DYNAMIC HTML

The World Wide Web ignited a computer revolution by enabling anyone to publish HTML documents. Until recently, the information in these documents was mostly static, requiring the server to respond to user interactions. With the introduction of Dynamic HTML, the web paradigm has shifted away from requiring server interactions to crating interactive Web sites and Web applications

because Dynamic HTML allows HTML documents to interact with the user and change completely on the client. Dynamic HTML is built on an object model that extends the traditional static HTML document.

JAVASCRIPT

JavaScript is an interpreted, object-based scripting language. Although it has fewer capabilities than full-fledged object-oriented languages like C++ and Java. JavaScript is more than sufficiently powerful front end purposes. JavaScript is not cut-down version of any other language (it is not only distantly and indirectly related to Java, for example), and it is not a simplification of anything. It is, however, limited. One cannot write standalone applications in it, for example, it has little capability for reading or writing files. Moreover, JavaScript scripts can run only in the presence of an interpreter, either in Web server or in a Web browser.

JavaScript is a loosely typed language. That means that one does not have to declare the data types of variables explicitly. Moreover, in many case JavaScript performs conversions automatically when they are needed. The features of JavaScript are:

- **Designed for Simple, Small Programs**

JavaScript is scripting language, it is well suited to implementing simple, small programs. For instance JavaScript ideally suited to developing a unit conversion calculator between miles and kilometers or pounds and kilograms. These tasks can

be easily written and performed at acceptable speeds with JavaScript and would be easily integrated into a web page.

- **Performs Repetitive Tasks**

Just as JavaScript is suited to producing small programs, it is especially well designed for repetitive event-invoked tasks. For example, JavaScript is ideal for calculating the content of one field in a form based on changes to the data in another field. Each time the data changes, the JavaScript program to handle the event is invoked, and the new data for the other field is calculated and displayed.

- **Designed for Programming User Events**

Because of the way in which JavaScript is integrated into the browser and can interact directly with HTML pages, JavaScript makes it possible to program responses to user events such as mouse clicks and data entry in forms. This adds interactivity to web pages, makes forms dynamic, and can decrease the bandwidth requirements and server incurred by using forms and CGI programming.

- **Easy Debugging and Testing**

Like other scripting languages, JavaScript eases development and troubles hooting because it is not compiled. It is easy test program code, look at the result, make changes, and test it again without the overhead and delay of compiling

- **The Java Clue**

When Netscape announce JavaScript, it referred to the language as the tool to "glue Java applets into Web pages". JavaScrip t rigger events in Java applets, and Java applets can tell JavaScript methods and functions.

JAVA APPLETS

Java is a revolutionary programming language that was introduced by Sun Microsystems in June 1995. Since then, Java become the language of choice for developing both Internet and intranet applications. We can use Java to write applets, window and console applications, beans, servlets and distributed objects.

An applet is a Java program that is executed in the context of a web page. It is loaded and executed by any Java-capable web browser that displays a web page referencing the applet. Applets area referenced I web pages using the HyperText Markup Language (HTML)<APPLET>tag. Applets consist of compiled Java code that is stored on a Web server, along with the web pages from which they are referenced. Applets are used to create fancy web page widgets such as animated advertisements, to implement complex web based applications such as database front-ends, and a wide range of games. Creating sub classes of the Applet class of the Java Applet package develops Applets. Special methods are created that supports applet initialization, the starting and stopping of an applet, and applet termination. GUI controls are also provided in the applets and methods are included for handling GUI events .

JAVA SERVLETS

Servlets are the sever-side analogue of applets. They are written to the Servlet API and are installed on a Web Server. Servlets are generic extensions to Java-enabled servers. Their most common use is to extend web servers providing a very secure, portable, and easy -to -use replacement for CGI. A Servlet is dynamically loaded module that services requests from a Web Server. It runs entirely inside the JVM. Because the Servlet is running on the server -side, it does not depend on browser compatibility. They can he used for any web-related applications.

Server programs run behind the scenes to provide vital data and services for our user applications. Examples of server programs are Web servers, mail servers, file servers, database servers, and so on. In addition to these large server programs, there is a need for small-customized server programs that perform specialized tasks. For example, the Common Gateway Interface (CGI) programs are executed by web servers to perform web searches, process form data, and provides dynamic feedback to web users. CGI programs are designed to be small, fast, and efficient and are written to support specialized web applications.

Recognizing the need for this type of server programming, Java Soft has developed the Java Server Toolkit and the Servlet API. The Java Server Toolkit is as client -server framework for building Internet and Intranet servers. It implements the functions that are common to many servers, such as

listening for client connections made by clients over these connections. The Servlet API is used to develop custom serve-side programs for the processing of client request. It can he used as a Java API for writing CGI programs, and is supported by all major web server products. However, the Servlet API extends beyond CGI programming. It is envisioned that servers of all types will support the use of Servlets for servicing client requests.

THE JAVA SERVLET ARCHTECTURE

Two packages make up the Servlet architecture: the javax.servlet and javax.servlet.http. The javax.servlet package contains the generic interfaces and classes that are implemented and extended by all Servlets. The java.servlet.http package contains the classes that are extended when creating HTTP-specific Servlets. An example of this would be a simple Servlet that responds using HTML.At the heart of this architecture is the interface javax.servlet.Servlet. It provides the framework for all Servlets. The Servlet interface defines five methods. The three most important are

- The init () method that initializes a Servlet
- The service () method that receives and responds to client requests
- The destroy () method that performs a clean up

How Does Java Web Server Work?

Because Java Web Server is built using the Java Server Framework, it follows its basic execution paradigm. An acceptor listens for incoming connection requests on the TCP ports managed by the server. It hands off accepted connections to connection handlers. The connection handlers receive HTTP requests from Web Server clients and load and invoke Servlets to process the HTTP requests.

What is unique about Java Server Toolkit, in general, and Java Web Server, in particular, is the use of Servlets. Servlets are extensions that are written in Java and are associated with particular URLs. When a request for the URL of a Servlet is received from a Web browser; Java Web Server invokes the Servlet to process the request. Java Web Server provides the Servlet with all the information it needs to process the request. It also provides a mechanism for the Servlet to send response information back to the Web browser. The Servlet API is used to develop Servlets. Java can preload Servlets a Web server loaded on-the-fly, as they are needed.

Writing Servlets

Servlets are server-side analogue of applets. They are written to the Servlet API and are installed on the Web server. Besides Java Web Server, a number of Web Servers supports Servlets, and the Servlet API. the following list identifies some of these web servers: Apache 1.1.3, Netscape Fast Track 2.0, Enterprise 2.0,

Enterprise 3.0, Microsoft IIS 2.0.IIS 3.0, Weblogic Tengah, Lotus Domino Go Web server, IBM Internet connection Server

Servlets are loaded in the Servlets directory of the Web Server and can be invoked by the following URL:

http://your.host.com: port/servlet/ServletName.class [arguments]

The name of our Web server host and port are substituted for *your.host.com: port*, *and* the class name of our Servlet is substituted for ServletName.class. The optional *arguments* are a standard URL –encoded query string. Most likely, the Servlets will be similar to CGI programs in the services they provide. The advantages of Servlets over CGI programs are that there is minimal server overhead in invoking them, they are provided with direct access to server resources, and they are written in java.

The Servlet API

The Servlet API is a standard extension API, meaning that it is not part of the core Java Platform. The Servlet API packages include the Javax.servlet package and the javax.servlet.http package.

The javax.servlet Package

The javax.servlet package defines the following six interfaces and three classes

javax.servlet interfaces

Servlet - The Servlet interface must be implemented by all Servlets. The init () and destroy () methods are invoked by the server to start and stop a Servlet. The getServletConfig () method and getServletInfo () method are overridden to return information about a Servlet. The service () method is invoked by the server so that a Servlet can perform its service .It has two parameters one of the ServletRequest interface and one of the ServletResponse interface.

ServletRequest- the ServletRequest interface encapsulates a client request for s service. It defines a number of methods for obtaining information about the server, requester and request. The getInputStream () method returns an object of the ServletInputStream class that may be used to read request information sent by the client .

ServletResponse- the ServletResponse interface is used by a Servlet to respond to a request by sending information back to the requester. The getOutputStream () method returns a PrintWriter object that is used for client communication. The setContentType () method sets the MIME type of the length of the response in bytes. The getCahracterEncoding () method returns the MIME type associated with the response.

ServletConfig- the ServletConfig interface is used by the server to pass configuration information to Servlet. Its methods are used by the Servlet to retrieve this information.

ServletContext- this interface defines the environment in which an applet is executed .It provides methods that are used by applets to access environment information.

SingleThreadModel- this interface is used to identify Servlets that must be thread-safe. If a Servlet implements this interface, the Web server will not concurrently execute the service () method for more than one instance of the Servlet.

javax.servlet classes

GenericServlet-The GenericServlet class is a convenience class that implements the Servlet interface. We can subclass to define our own Servlets.

ServletInputStream-This class is used to access information supplied by a web client. An object of this class is returned by the getInputStream () method of the ServletRequest interface.

ServletOutputStream-This class is used to send response information to a web client. An object of this class is returned by the getOutputStream () method of the ServletResponse interface.

The javax.servlet.http Package

The javax.servlet.http package is used to define HTTP-specific servlets. It defines the following interfaces and classes:

Javax.servlet.http.interfaces

HttpServletRequest- this interface extends the ServletRequest interface and adds methods for accessing the details of an HTTP request.

HttpServletResponse- this interface extends the ServletResponse interface and adds constants and methods for returning HTTP-specific responses.

HTTPSession- this interface is implemented by Servlets to enable them to support browser –server sessions that span multiple HTTP request-response pairs. Since H TTP is a stateless protocol, Session State is maintained externally using client-side cookies or URL rewriting. This interface provides methods for reading and writing state values and managing sessions.

HttpSessionBindingListener- this event listening interface is implemented by classes whose objects are associated with HTTP sessions. The value Bound () method is used to notify an object that is bound to an HTTP session, and the value Unbound () method is used to notify an object that is unbound from an HTTP session.

HttpSessionContext- this interface is used to represent a collection of HttpSession objects that are associated with session Ids. The getIds () method returns the HttpSession object associated with a particular session ID. Session Ids are implemented as String objects.

Javax.servlet.http classes

Cookie- This class represents an HTTP cookie. Cookies are used to maintain Session State over multiple HTTP requests. They are named data values that are created on the Web Server and stored on individual browser clients. The Cookie class provides the method for getting and setting cookie values and attribute.

HttpServlet- the HtttpServlet class extends the GenericServlet class to use the HttpSessionServletRequest and HttpServletResponse interfaces.

HttpSessionBindingEvent- this class implements the event that is generated when an object is bound to or unbound from an HTTP session.

HttpUtils- this class provides the parseQueryString () method for parsing a query string contained in an HTTP request.

Overview of JDBC

Advanced web applications often interface with database management systems. These database systems serve as repositories for large amounts of information that is collected and used by the application. The Java Database connectivity (JDBC) is a pure Java API used to execute SQL statement. It provides a set of classes and interfaces that can be used by developers to write database applications. JDBC can be used from within the Java programs to access almost every SQL database on the planet Microsoft Access, Oracle, Sybase, DB2 etc

Basic JDBC interaction, can be broken into four steps

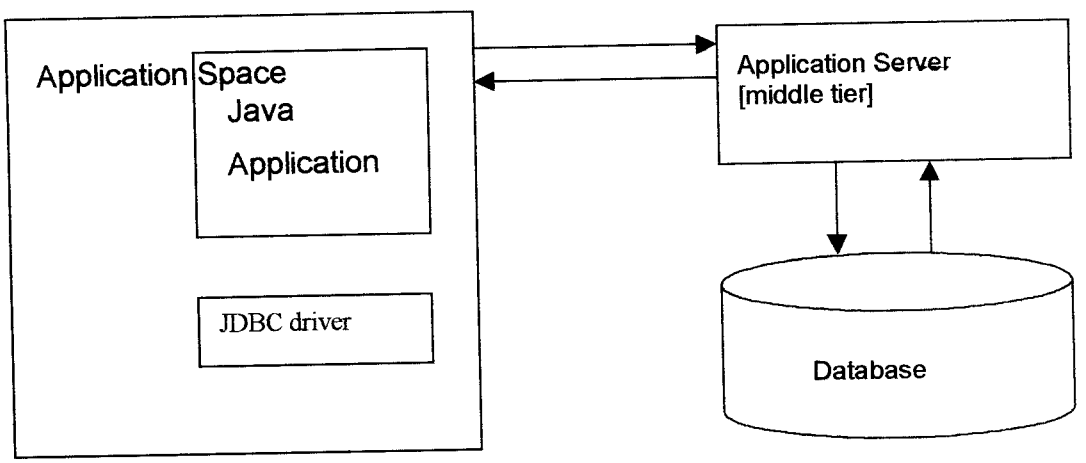
- Open a connection to the database
- Execute a SQL statement
- Process the results
- Close the connection to the database

JDBC drivers are used by Java applications to communicate with database servers. JDBC drivers do not directly communicate with database products. Many JDBC drivers communicate with database using ODBC (Open Database Connectivity), which is a common standard established by Microsoft for communicating with databases. ODBC drivers provide a common application-programming interface to database clients.

Two and Three Tier Database Access Models

The JDBC provides support for two and three-tier database access models. In a two–tier database access model the Java application talks directly to the database. The results of these commands are then sent from the database directly back to the application. In a three–tier database access model, the JDBC driver sends ommands to a middle tier, which in turn sends commands to the middle tier,

which communicates them back to the application. Figure below shows the three-tier model.



The four components of the JDBC system are given below

Data Source: - Usually SQL compliant databases, through drivers have become available for certain popular data sources as well.

Drivers: - provides an interface between a data source and an application program

A Driver manager: - selects an appropriate driver to handle each data source.

Application Program: - sends data to, and receive data from a data source via driver.

Establishing a connection to a database is a two–step process. First we have to load the JDBC driver, and then make a connection. Loading the driver involves just one line of code. Here we want to use the JDBC-ODBC Bridge driver. The following code will load it:

Class.forName("sun.jdbc.odbc.JdbcOdbcDriver");

To make a connection, make a call to the static method Driver Manager.getConnection(), which returns a call to the database. Its method signature is listed as follows:

public static synchronized Connection getConnection(String url, String user, String *password*) throws SQLException

The first parameter is the URL that points to the data source where the DataSourceName is the name of the ODBC datasource, which is set up. The next two parameters are the username and the password associated with the database login.

Here the DataSourceName is bank. Empty strings are used for both user name and password. The code used to open a connection to the database is

Con = DriverManager.getConnection("jdbc:odbc:bank", "","");

The Connection object returned from the Driver Manager is an open connection to the database. It will be used to create JDBC statements that pass SQL statements to the database.

Creating a JDBC Statement Object

To execute any SQL command using a JDBC connection, we must first create a Statement object. To create a Statement, we must call the Connection create Statement() method. It returns a JDBC statement that you will use to send SQL statement to the database .The following code shows how to create a statement

Statement statement = con.createStatement();

Working With ResultSets

When a database query is executed, the results of the query are returned as a table of data organized according to rows and columns. The ResultSet interface is used to provide access to this tabular data, one row at a time.

A ResultSet object maintains a pointer to a row within the tabular results. This pointer is called a cursor. When a ResultSet object is returned from a query, the cursor initially points immediately before the first row of the table. The next() method of the ResultSet class is used to move the cursor to the next row of the table. The next() method returns a Boolean value that is true if the next row is returned and false if the end of the table is reached. The next() method is used to successively step through the row of the tabular results.

Executing SQL Statement

SQL statement can be used to add information to database, update or delete existing database information, or retrieve information from a database. The

purpose of the java.sql package is to allow you to execute SQL statements from Java.

The Statement Interface

The Statement interface defines methods that are used to interact with databases via the execution of SQL statements.

The executeQuery() method executes an SQL statement that can queries a database and returns the integer value of the row count associated with the SQL statement, or Zero if the statement did not return a result. The execute() method executes an SQL statement that is written as a String object. It returns a Boolean value indicating whether a ResultSet object was produced as the result of the s statement's execution. The getResultSet() and getMoreResults() methods are used to retrieve the ResultSet objects.

Oracle8

Oracle8 is a Relational Database Management System (RDBMS). Oracle8 database that offers capabilities of both relational and object-oriented database systems. Oracle8 supports very large database that could contain hundreds of terabytes of information. It also provides access to many concurrent users to the order of

thousands or ten thousand users. Managing large amounts of data could present administrative and performance challenges. Oracle8's data partitioning features help to minimize the problem.

Oracle8 now offers most of the features that most operating systems had for years:

- Account disablement after a specified number of failed attempts.
- Password expiration and forced password changes.
- Password history maintenance to prevent users from using previous passwords.
- Complex password enforcement that forces users to choose passwords which cannot easily be guessed by potential intruders.

Oracle 8 Server and the Internet

The combination of Oracle8 and Java Web Server2.0 provides the frame work to connect the rational database to the intranet/internet while using web browsers to display data. This has several advantages like integrating NT operating system with allot the NT inter/intranet capabilities and the Oracle8 server database. By using JDBC-ODBC bridge , the Oracle8 server and Java Web server can communicate and developers have the functionality to deliver interactive, online database content to the masses via an internet web site.

4. SYSTEN DESIGN AND DEVELOPMENT

4.1 INPUT DESIGN

Input design is the most integral part and in a web based application and this is accomplished with the help of User Input forms. The input data have to be validated, edited, organized, and accepted by the system before being processed to produce the outputs.

The main objective in input design are the following

- Produce cost effective method of input
- Achieve high level accuracy
- Ensure that the input is acceptable and understood by the user staff

The Home Page

Home page consists of certain set of applications and each one are very easy to use. The options available are user login, scrip search, new user sign up, online index, flash news facility etc...

User Login

The user login field is to login for a registered user, i.e. a stockbroker. Then the password also must be entered. If both the user name and password are valid you are entered into a new screen. Once successfully entered certain set of options are available for the user. If the administrator login he/she gets another screen with

some more options available. Both client side and server side validations are done here in the site. Whatever happens user gets a right response in the instance time.

Scrip Search

A scrip is any company which is listed in the stock exchange listing. The user can search for particular scrip's details in the database table. The interface for that is provided in the front page. There a user can search for a particular scrip details using three ways they are using the scrip code, the scrip name and using the universal code number. Once successfully entered particular scrip's details are displayed in new page.

New User Sign Up

For a new user to sign up, some forms are provided. The validity of the form and it's contents are then checked later and if all the fields are entered correctly your details are updated to the table and you are added as a new user.

Online Index

The most important functionality of the site. Each time the current index value of the scrip's are selected from the table and displayed in the home page. Each particular scrip's code and the last traded prices are displayed in the form of a

scrolling text. When each new trading take place it is updated in the database and each refreshes brings them to the front page.

Flash News

This is a facility to display any flash news regarding the stock exchange or some general matters. It's the privilege of the administrator to change the flash news when needed. A normal user does not get the right to change the news. But everyone can notice the news in the home page of the site .

The Fast Entry Screen

This is the screen provided for the valid member to place an immediate order. The screen contains the sufficient fields needed for a single order. The screen is divided into two. One part is the fast entry screen and the other part is the help display from the table. The fast entry screen also contains a pull down help menu so that the user can immediately choose a scrip code without typing it.

The Batch Entry Screen

This is somewhat similar too the fast entry screen. This also helps to place orders but the difference is that here orders can be placed as a batch. I.e. when an order is placed and submitted it is added to a batch screen, similarly as much orders user wishes to place can be typed. Finally all the orders are placed in a single

option that is submitted by the user, the system displays the output. The output that is obtained for each query submitted should be tested before confirming the result.

Types of outputs are

- Online index value
- Closing rates of various companies
- Scrip details.
- Tarding facility.

4.3 DATABASE DESIGN

A database is a collection of stored data organized in such a way that all the user data requirements are satisfied by the data base. In order to design database and the tables used in the system, Oracle provides extra optional facilities which aid and control each user's access to use the database for adding, modifying and retrieving data and facilitate data independence, integrity and security.

1.Data Integration

In a database, information from several files is coordinated, acessed and operated upon as though it is in a single file. Logically, the information is centralized, Physically the data may be located on different devices and in widely scattered geographical locations, connected through data

communication facilities. In order to achieve the objectives of data centralization, links between data must be maintained. It must be possible to acess data records using a wide variety of search keys.

2.Data Integrity

This ensures the correctness and completeness of the data in the database. When the contents of the database are modified the integrity of the database is lost. To maintain the consistency of data, integrity constraints are imposed. They restrict and violate the data values that are inserted or updated in the database. Some of the integrity constraints are

Domain constraints	-Specifies NULL or NOT NULL.
Validity Integrity	-Checks for Data Type and Range.
Entity Integrity	-Uniqueness and Primary key
Referential Integrity	-Foriegn key relations

3. Data Independence

Data Independence is the insulation of application programs from changing aspects of physical data organization. This objective seeks to allow changes in the content and organization of physical data without reprogramming of applications and to allow modifications to application programs without reorganizing the physical data.

The various tables used are given below

Table#1

Table Name: BUY_TRAN

Purpose: Lists the details of the scrip to be bought.

Name	Null?	Type
BT_SCRIPID	NOT NULL	NUMBER(5)
ORDERID	NOT NULL	NUMBER(5)
BT_TRADERCD	NOT NULL	VARCHAR2(5)
BT_DTTYPE	NOT NULL	DATE
BT_TOTALQTY	NOT NULL	NUMBER(5)
BT_PENDQTY	NOT NULL	NUMBER(5)
BT_PRICE	NOT NULL	NUMBER(10,2)

Table#2

Table Name: SELL_TRAN

Purpose: List the details of the scrip to be sold.

Name	Null?	Type
ST_SCRIPID	NOT NULL	NUMBER(5)
ORDERID	NOT NULL	NUMBER(5)
ST_TRADERCD	NOT NULL	VARCHAR2(5)
ST_DTTYPE	NOT NULL	DATE
ST_TOTALQTY	NOT NULL	NUMBER(5)
ST_PENDQTY	NOT NULL	NUMBER(5)
ST_PRICE	NOT NULL	NUMBER(10,2)

Table#3

Table Name: TRADE_TRAN

Purpose: Lists the details of the scrip after trading.

Name	Null?	Type
TT_SCRIPID	NOT NULL	NUMBER(5)
ORDERID	NOT NULL	NUMBER(5)
TT_TRADEID		NUMBER(5)

TT_DTTIME	NOT NULL	DATE
TT_QTY	NOT NULL	NUMBER(5)
TT_PRICE	NOT NULL	NUMBER(10,2)
TT_BTRADERCD	NOT NULL	NUMBER(5)
TT_STRADERCD	NOT NULL	NUMBER(5)
TT_TRADETYPE	NOT NULL	CHAR(1)

Table#4

Table Name: USER_MAST

Purpose: This table stores the user name and passwords of the users.

Name	Null?	Type
UM_NAME	NOT NULL	VARCHAR2(30)
UM_PASSWD		VARCHAR2(30)
UM_LEVEL	NOT NULL	VARCHAR2(5)
UM_CODE	NOT NULL	NUMBER(10)

Table#5

Table Name: CSE_BROKER

Purpose: Stores the details of the valid broker.

Name	Null?	Type
CB_TRADE_CODE	NOT NULL	NUMBER(8)
CB_TRADE_NAME	NOT NULL	VARCHAR2(20)
CB_MEM_NAME	NOT NULL	VARCHAR2(30)
CB_OFF_ADDR	NOT NULL	VARCHAR2(100)
CB_OFF_PHONE1		NUMBER(14)
CB_OFF_PHONE2		NUMBER(14)
CB_OFF_PHONE3		VARCHAR2(14)
CB_OFF_PHONE4		VARCHAR2(14)
CB_RES_ADDR	NOT NULL	VARCHAR2(100)
CB_RES_PHONE1		VARCHAR2(14)
CB_RES_PHONE2		VARCHAR2(14)
CB_RES_PHONE3		VARCHAR2(14)
CB_RES_PHONE4		VARCHAR2(14)
CB_TELEX		VARCHAR2(20)
CB_FAX		VARCHAR2(14)
CB_EMAIL	NOT NULL	VARCHAR2(25)
CB_PHOTO		BINARY FILE LOB

Table#6

Table Name: CSE_JOURNALPUB

Purpose: Stores the data used for ordering stock journal.

Name	Null?	Type
PB_NAME	NOT NULL	CHAR(25)
PB_COMPANY		VARCHAR2(30)
PB_STRADDR		VARCHAR2(40)
PB_CITY	NOT NULL	CHAR(20)
PB_STATE	NOT NULL	CHAR(20)
PB_ZIP	NOT NULL	NUMBER(15)
PB_EMAIL	NOT NULL	VARCHAR2(30)
PB_CHEQUE	NOT NULL	NUMBER(15)
PB_BANK	NOT NULL	CHAR(25)
PB_DATE	NOT NULL	DATE

Table#7

Table Name:CSE_NEWCONTACTUS

Purpose: Stores the data needed for contacting the brokers.

Name	Null?	Type
CONT_NAME	NOT NULL	CHAR(30)
CONT_ORGANIZATION	NOT NULL	VARCHAR2(30)
CONT_STREET	NOT NULL	VARCHAR2(40)
CONT_CITY	NOT NULL	CHAR(30)
CONT_STATE	NOT NULL	CHAR(30)
CONT_POST	NOT NULL	NUMBER(15)
CONT_COUNTRY	NOT NULL	CHAR(20)
CONT_TELEPHONE	NOT NULL	NUMBER(20)
CONT_FAX	NOT NULL	NUMBER(25)
CONT_EMAIL	NOT NULL	VARCHAR2(30)
CONT_PROFESSION	NOT NULL	CHAR(30)
CONT_DESC	NOT NULL	VARCHAR2(300)

Table#8

Table Name: INDEXCALC

Purpose: Lists the details of the top twenty-five scrips.

Name	Null?	Type
IC_RMD	NOT NULL	DATE
IC_S_CD	NOT NULL	VARCHAR2(5)
IC_NO_TRADES	NOT NULL	NUMBER(5)
IC_TOT_RT	NOT NULL	NUMBER(13,2)
IC_CL_RT	NOT NULL	NUMBER(13,2)
IC_NO_SHARES_ISSUED		NUMBER(15)
IC_INDEX	NOT NULL	NUMBER(10,2)

Table#9

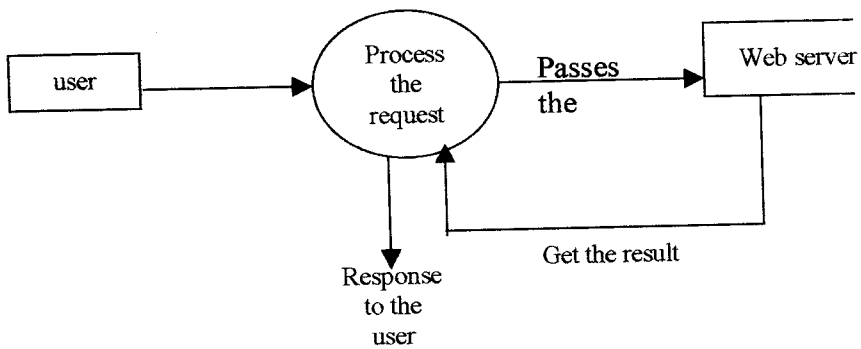
Table Name: SCRIP_MAST

Purpose: Stores the details of the scrip .

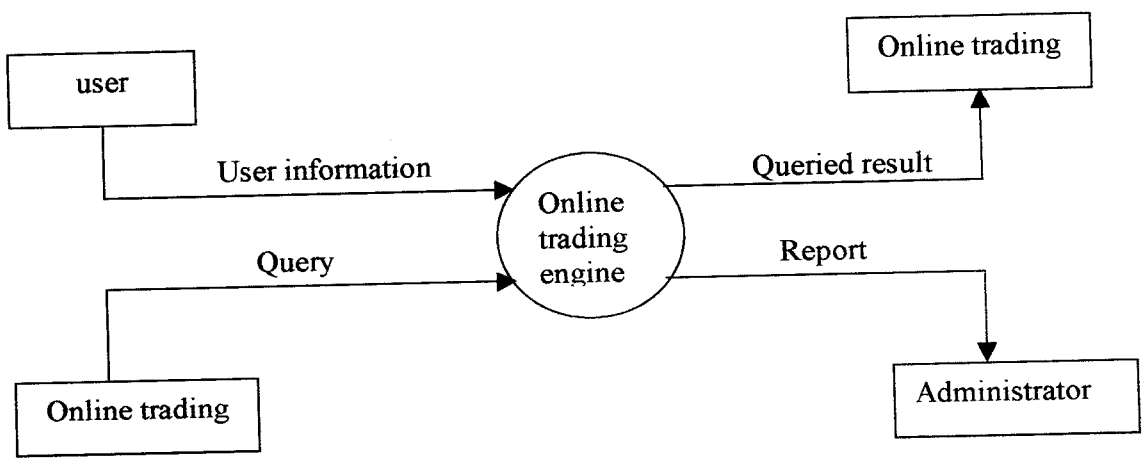
Name	Null?	Type
SM_SCRIPID	NOT NULL	NUMBER(5)
SM_SCRIPNAME	NOT NULL	VARCHAR2(30)
SM_SCRIPCD	NOT NULL	VARCHAR2(7)
SM_MKTLOT	NOT NULL	NUMBER(3)

4.4 PROCESS DESIGN

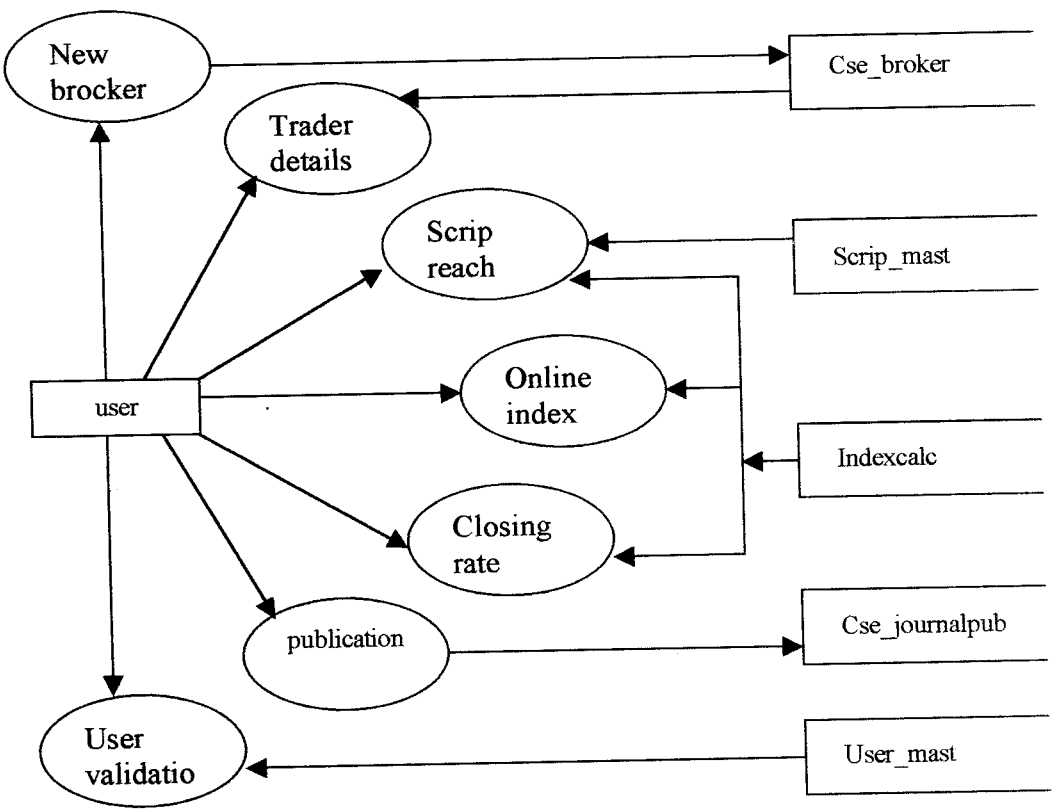
A data flow diagram is a graphical technique that depicts information flow and transforms that are applied as data move from input to output.The DFD is also known as a dataflow graph or bubble chart.



Context level



Level 1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Trader details
Scrip reach
Online index
Closing rate
publication
User validatio
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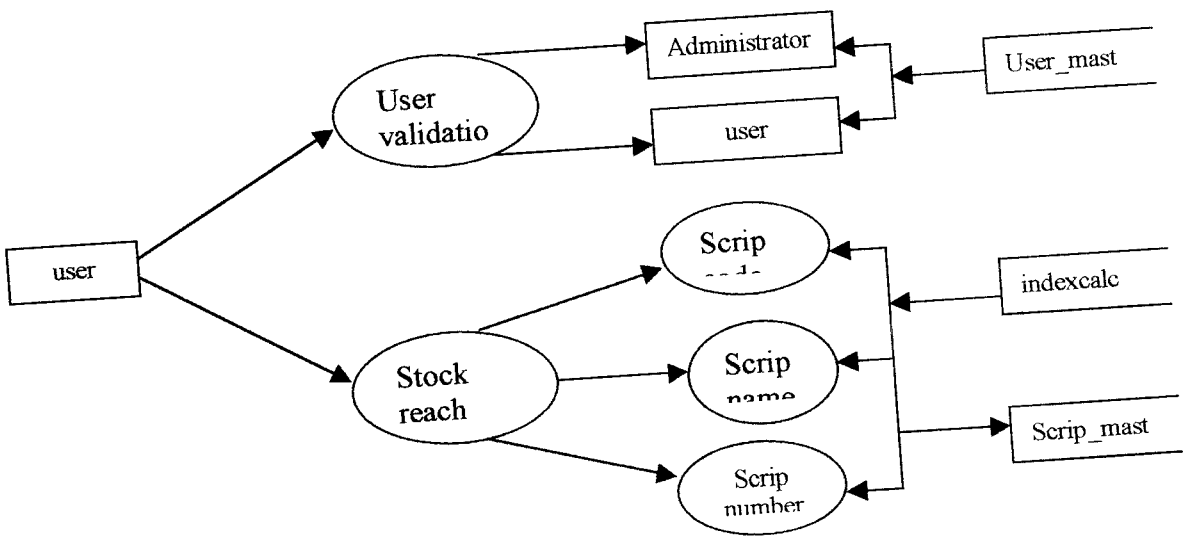
Cse_broker
Scrip_mast
Indexcalc
Cse_journalpub
User_mast

Level 2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Scrip
Scrip
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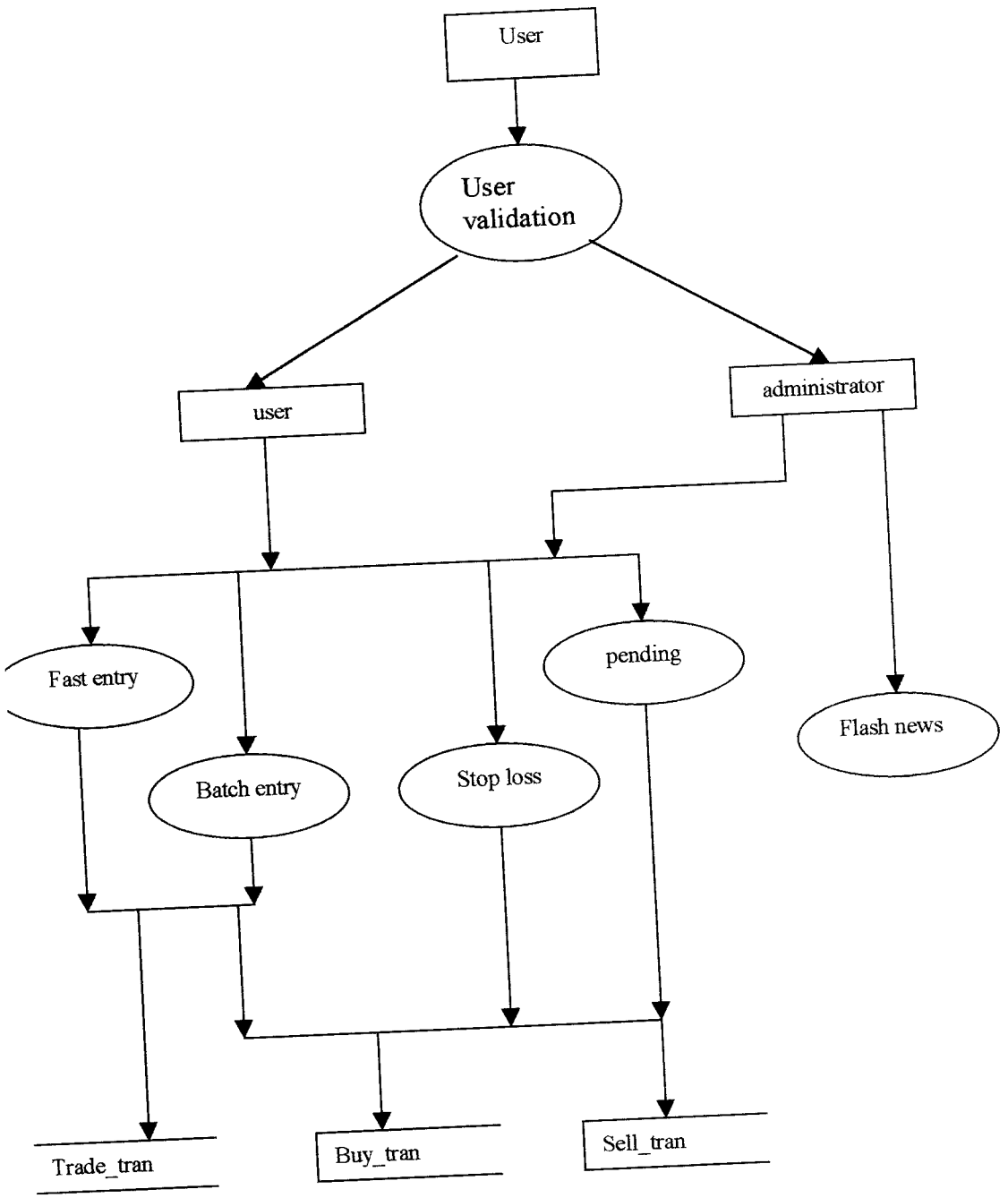
indexcalc
Scrip_mast

Level 3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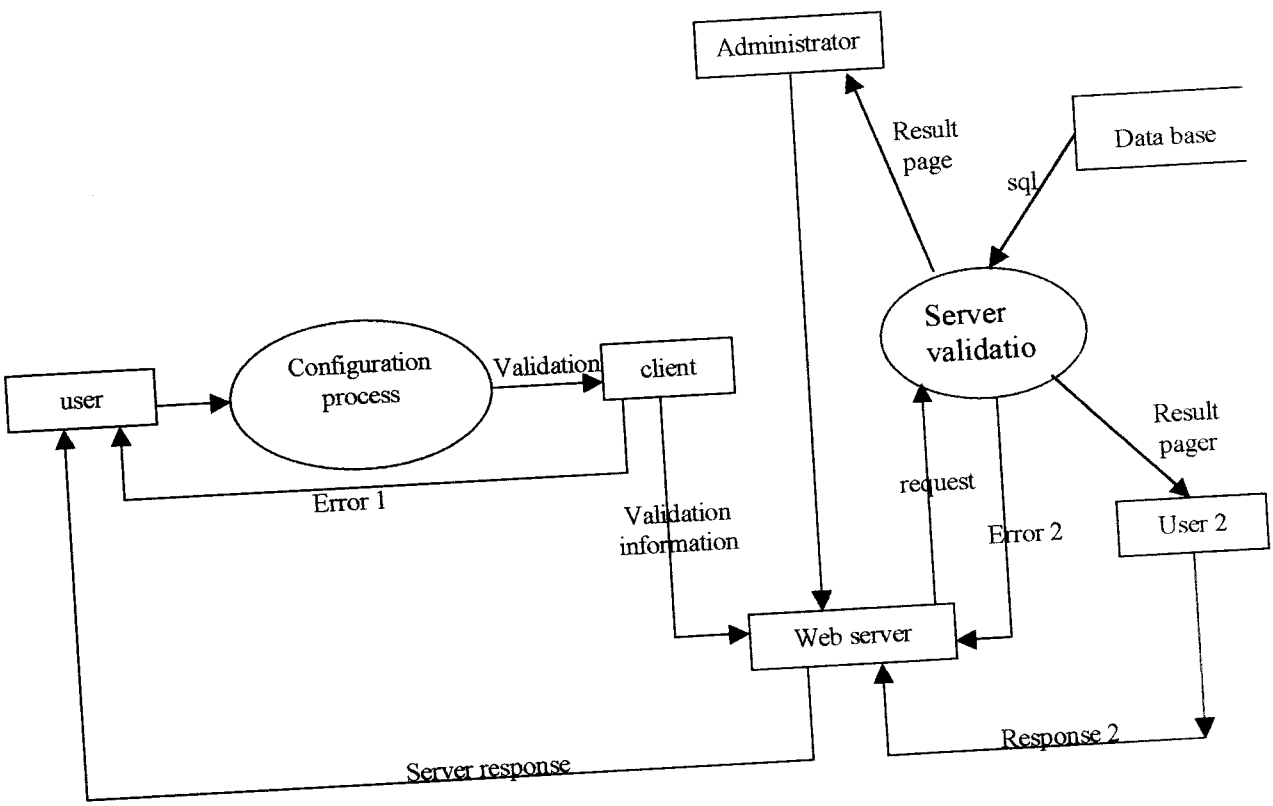
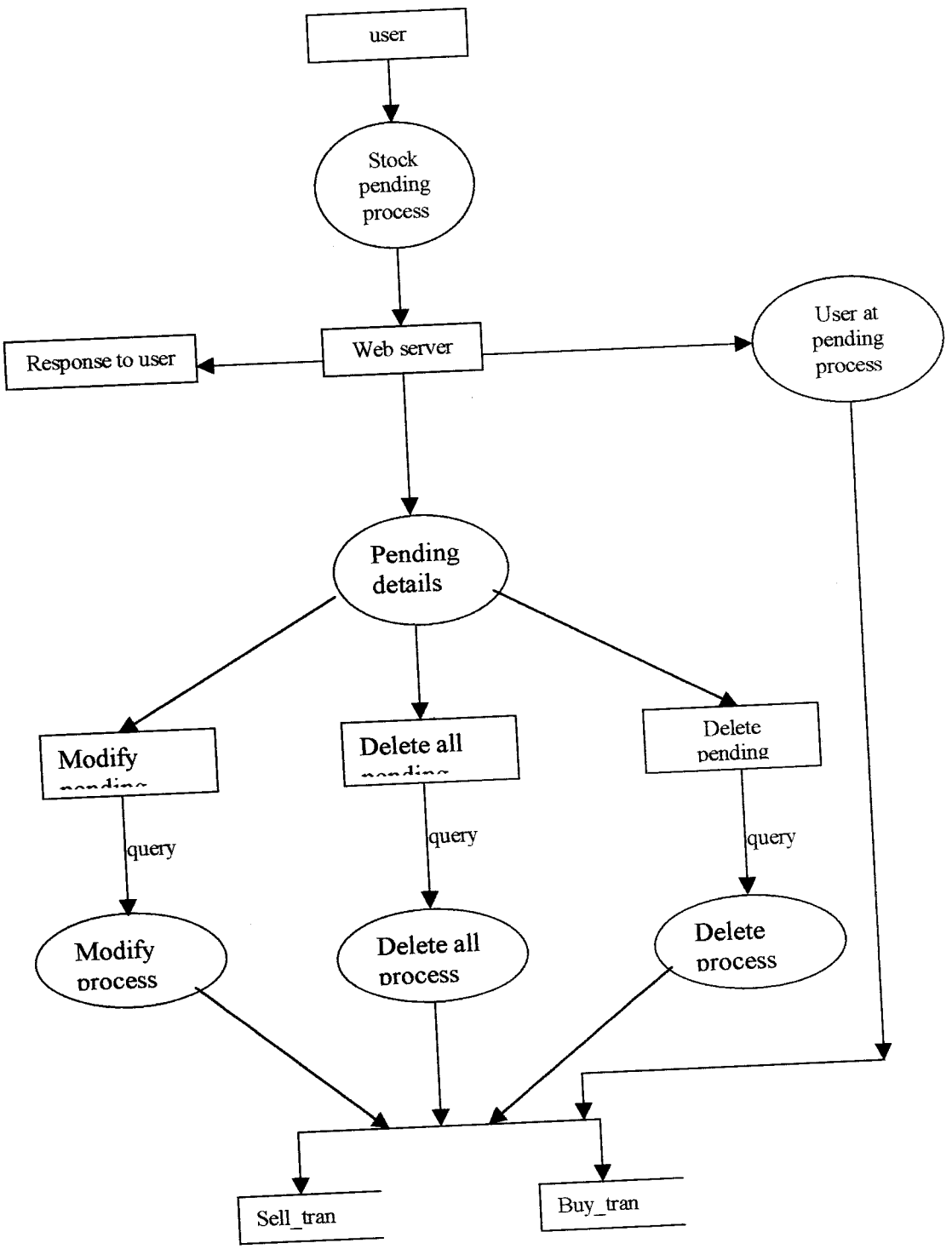
User validation
user
administrator
Fast entry
Batch entry
Stop loss
pending
Flash news
Trade_tran
Buy_tran
Sell_tran

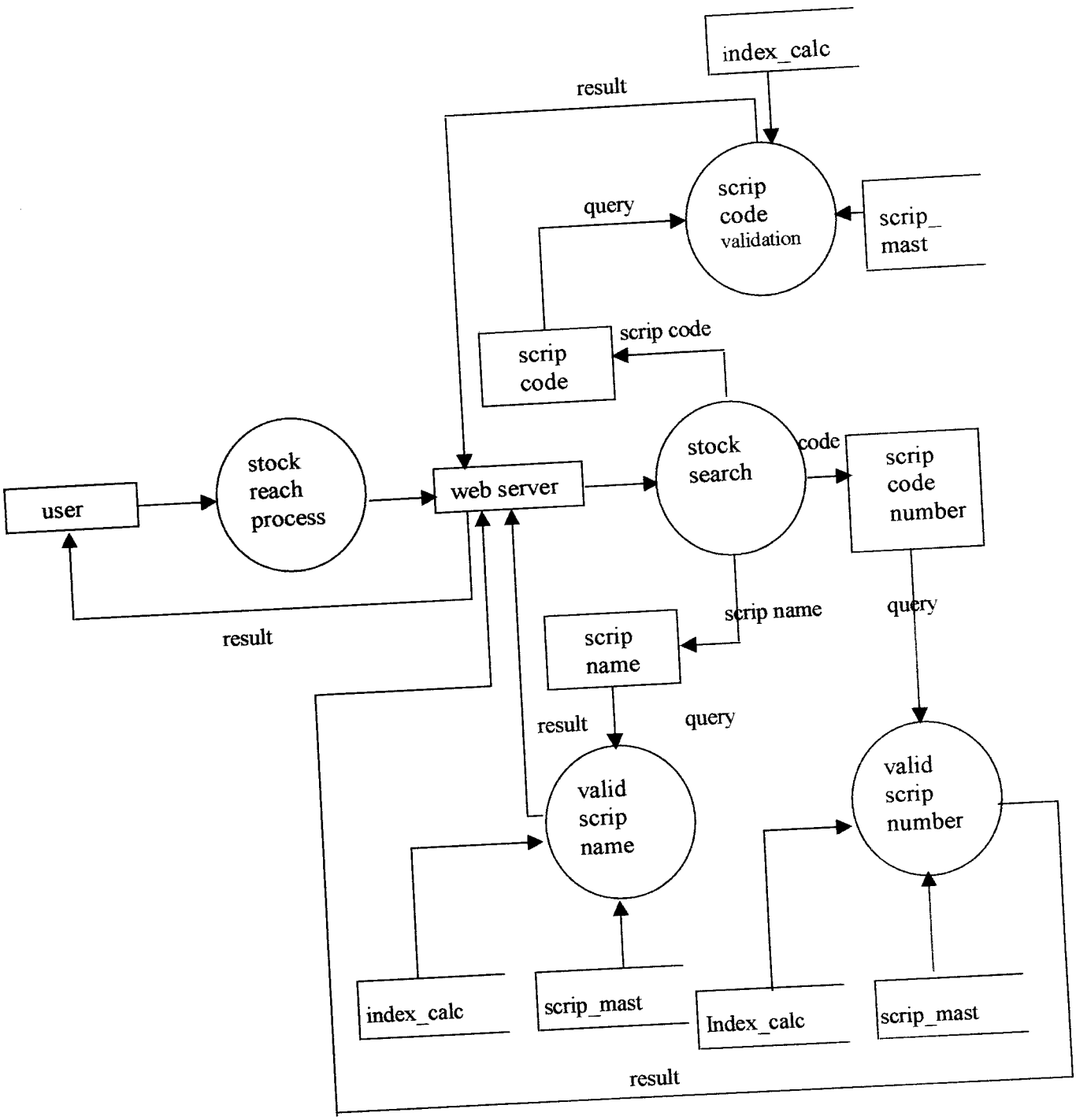
DFD for login process



DFD for Pending process



DFD For Stock Reach



5. SYSTEM IMPLEMENTATION ANDTESTING

5.1 SYSTEM IMPLEMENTATION.

A crucial phase of the software development life cycle is the successful implementation of the new system design. Implementation simply means converting a new system design into operation. This involves creating computer compatible files, training the staff and installing the hardware requirements. Implementation means here the process of a new or a revised system design into an operational one. Conversion is one aspect of implementation the other aspects are the post implementation review and software maintenance.

There are three types of implementation

- Implementation of a computer system by replacing a manual system. The problem encountered are converting files, training users etc...
- Implementation of a new computer system by replacing an existing one. This is usually a difficult conversion. Maximum interactivity is added to maintain people who were using the old site from getting restless with the new product.
- Implementation of a modified application to replace an existing one using the same computer. This type of conversion is relatively simple.

In our project the second case is adopted. I.e. the existing system of CSE is modified with a new system. The new system got a lot of additional features than

the older one. So all files used in the new system are newly created files. Adding some new fields also alters the tables and some tables are joined to create a single table. The design of the page is entirely changed and the interactivity is enhanced a lot. Any user can easily navigate through the site without another's help.

5.2 SYSTEM TESTING

Since no system design is ever perfect for various reasons, a system is tested for online response, volume of transactions, stress, recovery from failure and usability. In the system-testing phase the whole system is evaluated to check whether it hangs together or not. Following it is the acceptance testing or running the system with live data by the user. The number and nature of errors in a new design depend on several factors.

- Communication with the user and the designer.
- The programmers ability to generate a code that reflects exactly the systems specifications.
- The time frame for change.

What do we test for?

The major test for a system is to check whether it generates correct outputs. There are varieties of other tests too. They are...

Online response

The system must have a response time that must be acceptable to the user. When a particular request is given, the user expects the response in a time period and a good system should satisfy the need. In the system developed here the response time is fairly well. The execution speed can be enhanced using Java's most praised utility called multithreading.

Volume

Here we provide as many records as would normally be produced to verify that the hardware and software will function correctly.

Stress testing

The purpose of stress testing is to check whether the system provides a fairly well response time for a large amount of data over a short period of time. It is also checked and verified.

Recovery and security

A simulated system crash is carried out to check whether how the system responds in such situations. Again invalid data and input is given to detect the error detection capabilities.

5.3 REFINEMENT BASED ON FEEDBACK

Once all the preoaratory work of implementation has taken palce the system has been tested and the staff trained. it is a stage of moving over from the old system to new system. The application is put up on Cochin Stock Exchange website and are tested for the accurecy, response time, and other criteria. That may be affect when this is launched as a web based application.

6. CONCLUSION

The development of Internet as a daily need makes the web site as an undeniable factor to the corporate sector. In CSE the existing system is not compatible for the increasing demands of new technology. The new system developed kept all those drawbacks in mind and the forthcoming demands of the future too. The facilities for online trading are included. The facility to keep track of latest share values and access to any scrip details is added for that purpose. The site has maximum readability and interactivity. Navigation through the site will be very easy and enjoyable. The speed aspects of the site are taken into consideration. Better speed and performance is assured.

7. SCOPE FOR FUTURE DEVELOPMENT.

The software has been designed at the maximum possible excellence. Still we accept drawbacks, as it is a human effort. Here are some enhancements that can be added so that the software may deliver at it's best.

- The thread safety part of the system is not fully functional, that can be added to avoid unexpected failures.
- A facility may be added to store all orders placed during the non-trading time and that can be taken at the next trading time.
- The credit card validation with the bank cannot be done because of the time limit.

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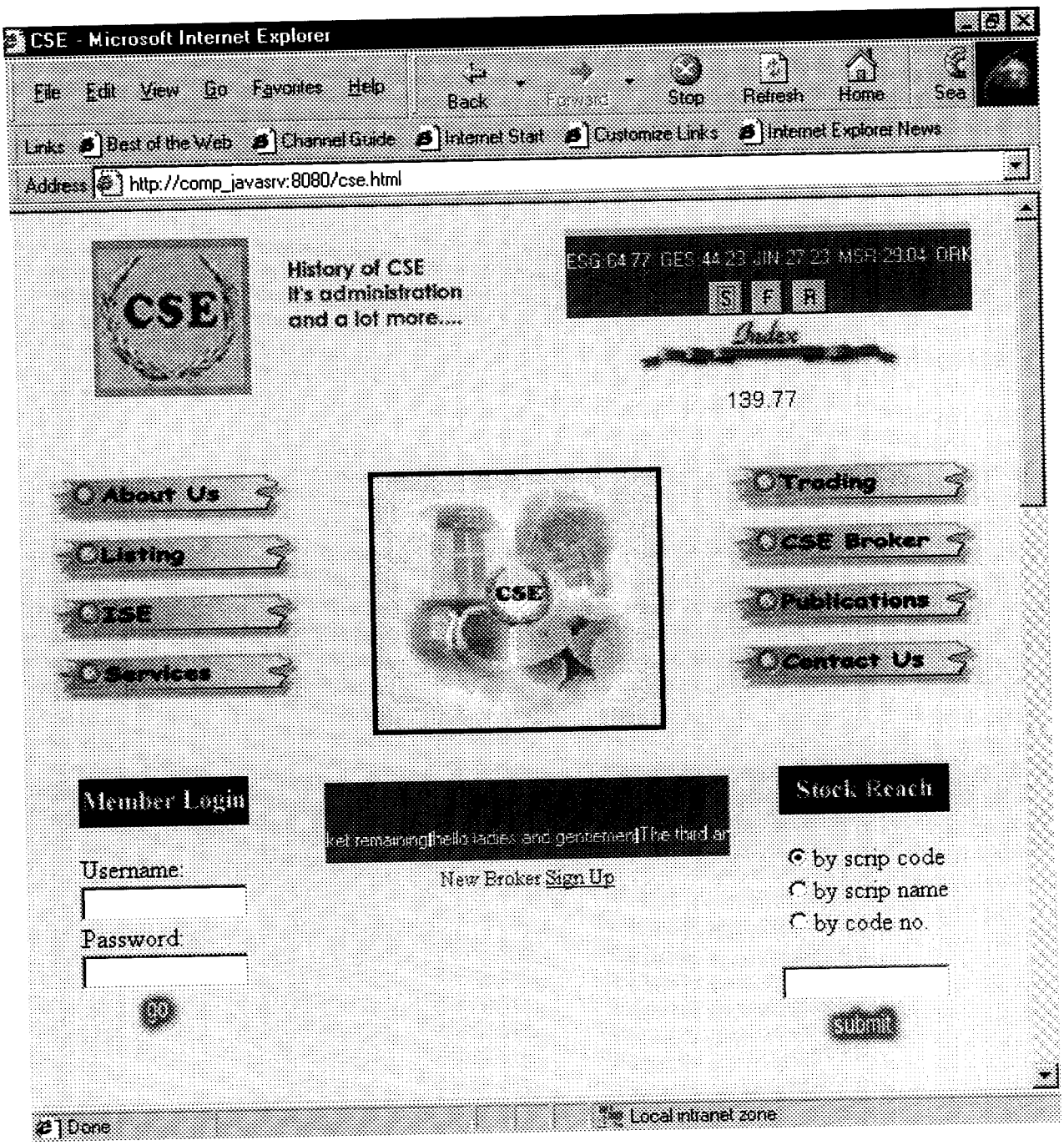
HOME PAGE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File Edit View Go Favorites Help
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Address http://comp_javasrv:8080/cse.html
CSE
History of CSE
It's administration
and a lot more....
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Listing
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Services
Trading
CSE Broker
Publications
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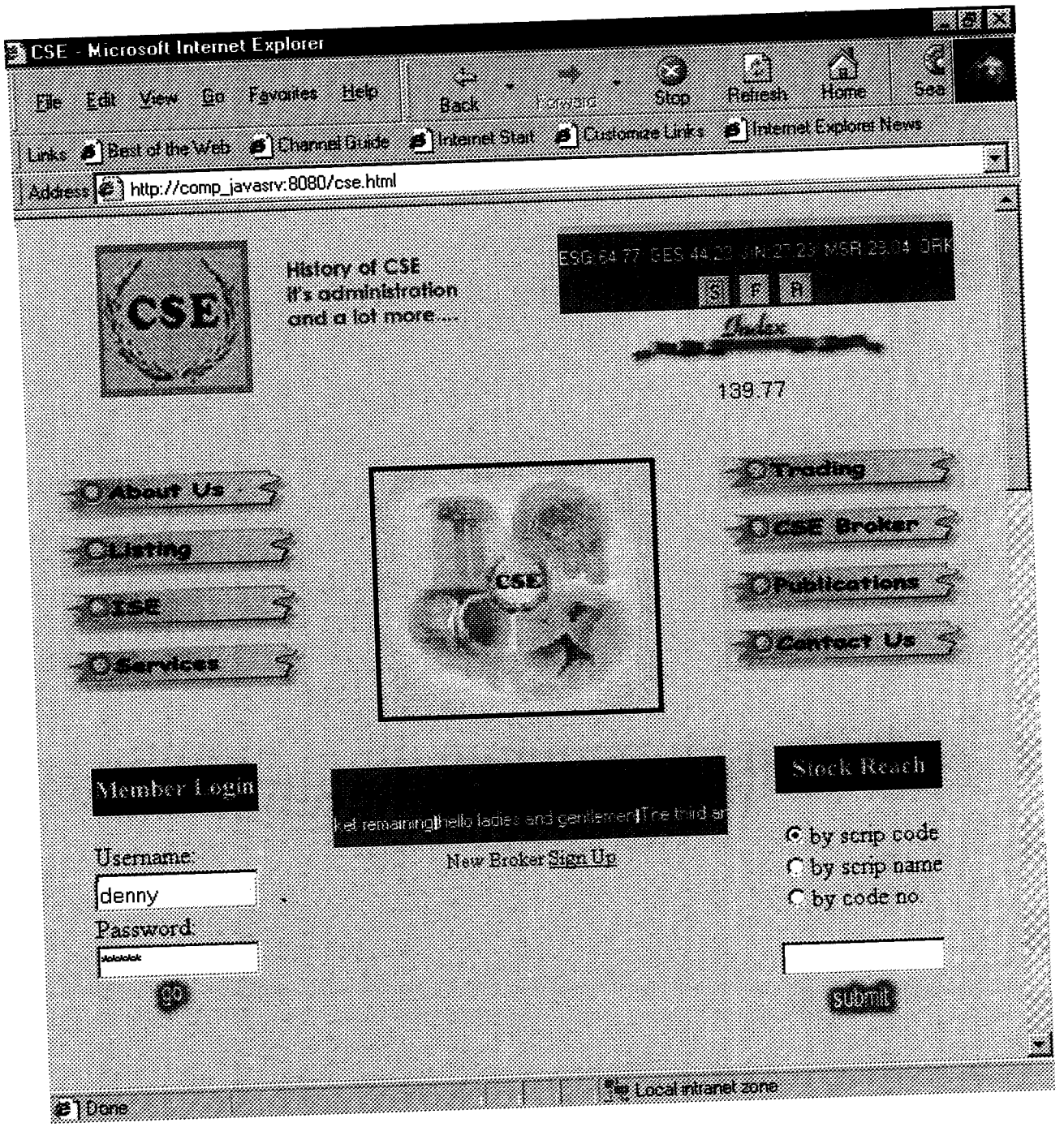
Local intranet zone

HOME PAGE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File Edit View Go Favorites Help
Back Forward Stop Refresh Home Sea
Links Best of the Web Channel Guide Internet Start Customize Links Internet Explorer News
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History of CSE
it's administration
and a lot more....
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About Us
Listing
CSE
Services
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Publications
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Member Login
Username:
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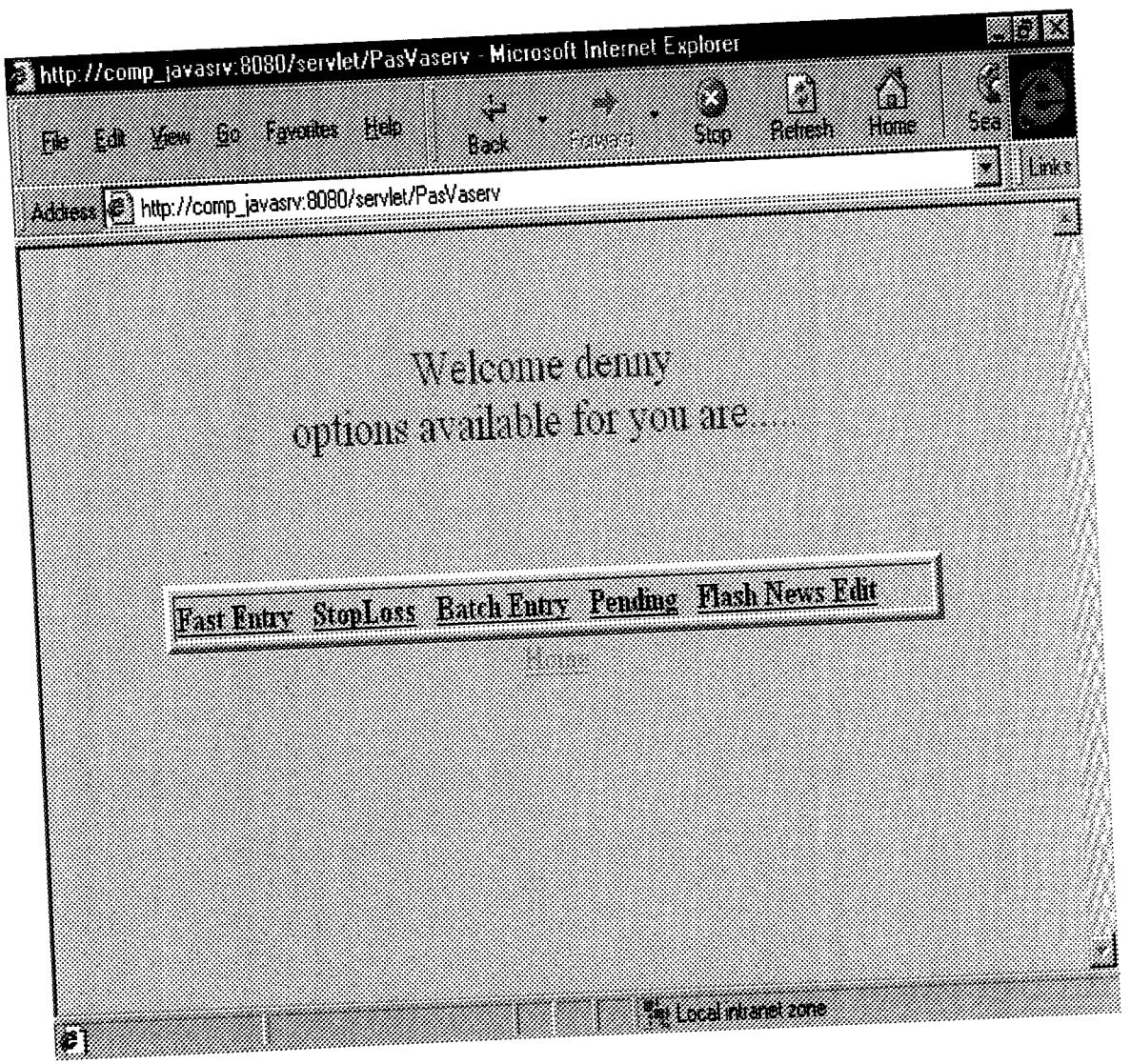
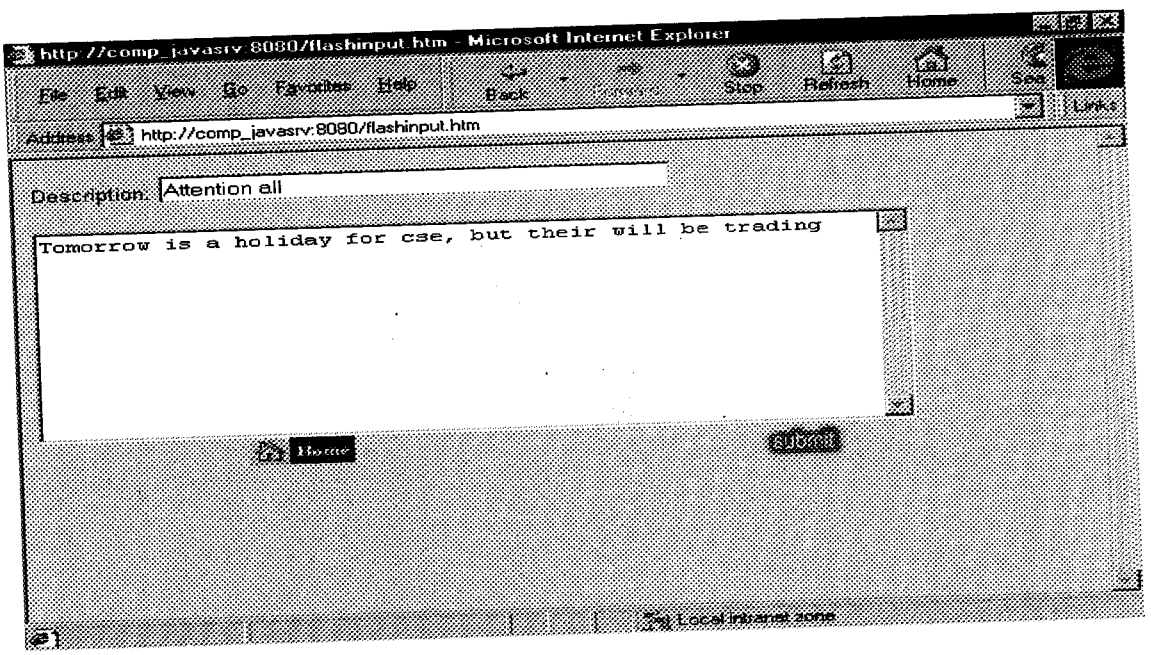
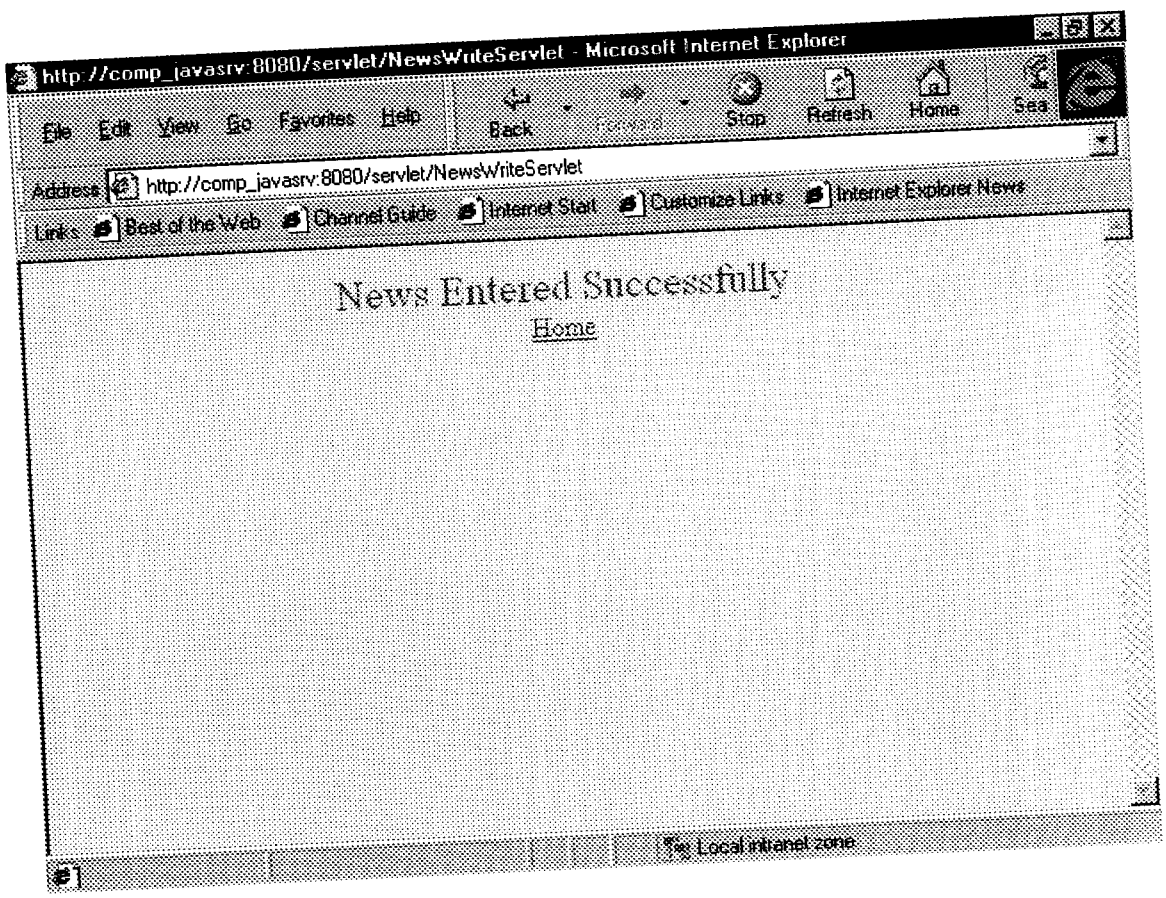
Password
New Broker Sign Up
Stock Reach
by scrip code
by scrip name
by code no
SUBMIT
Done
Local intranet zone

Administrator's Options

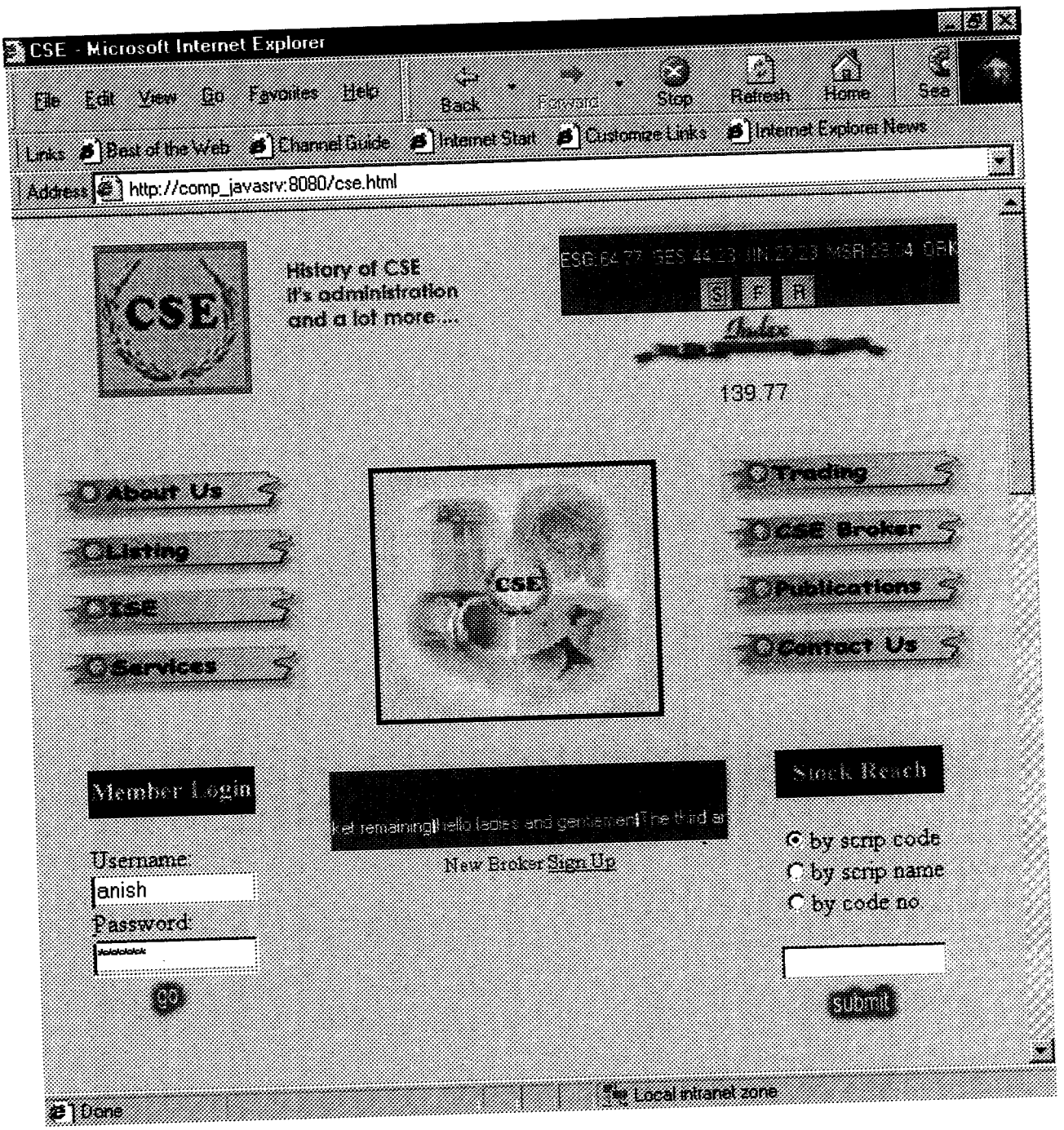


Flash News Screen

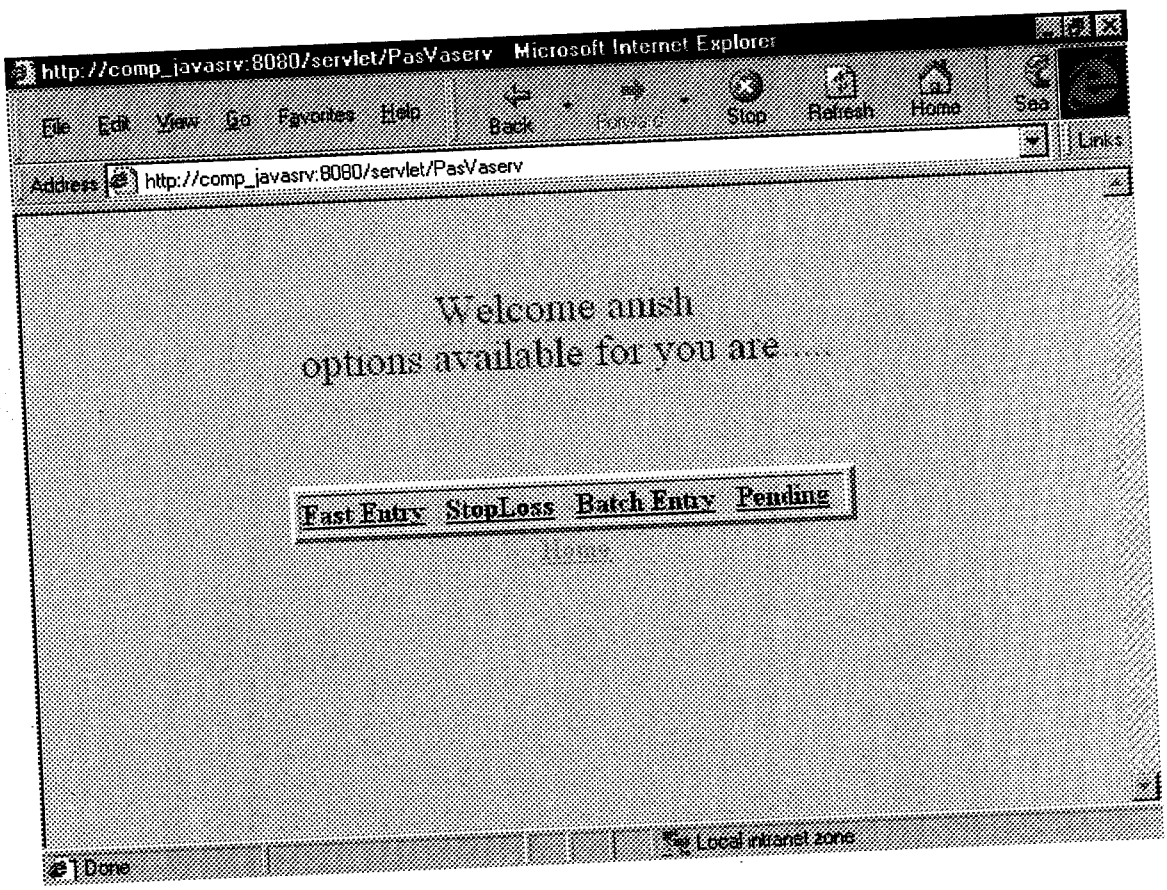



http://comp_javasrv:8080/servlet/NewsWriteServlet - Microsoft Internet Explorer
File Edit View Go Favorites Help
Back Stop Refresh Home
Address http://comp_javasrv:8080/servlet/NewsWriteServlet
Links Best of the Web Channel Guide Internet Start Customize Links Internet Explorer News
News Entered Successfully
Home
Local intranet zone

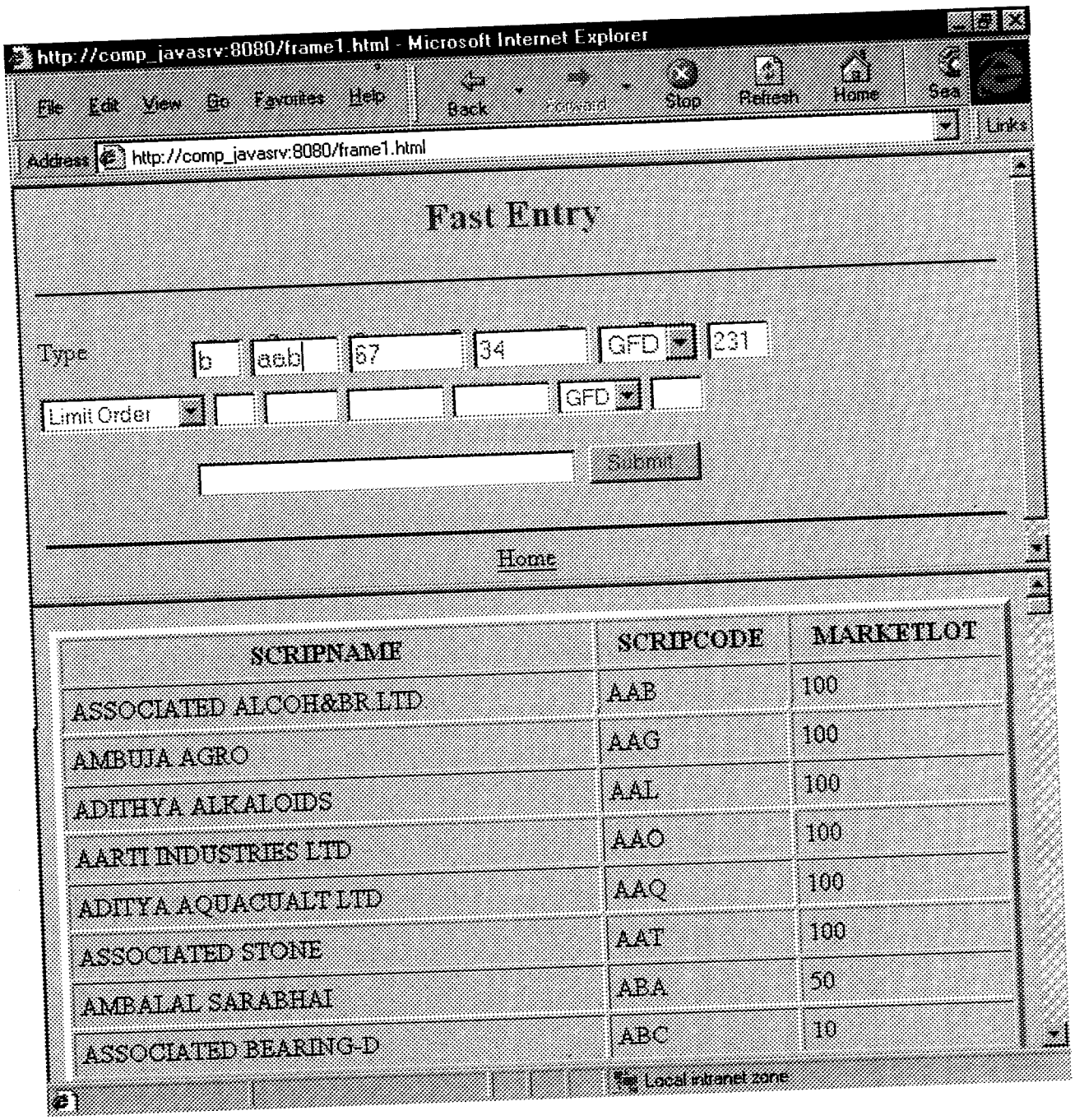
Broker Entry



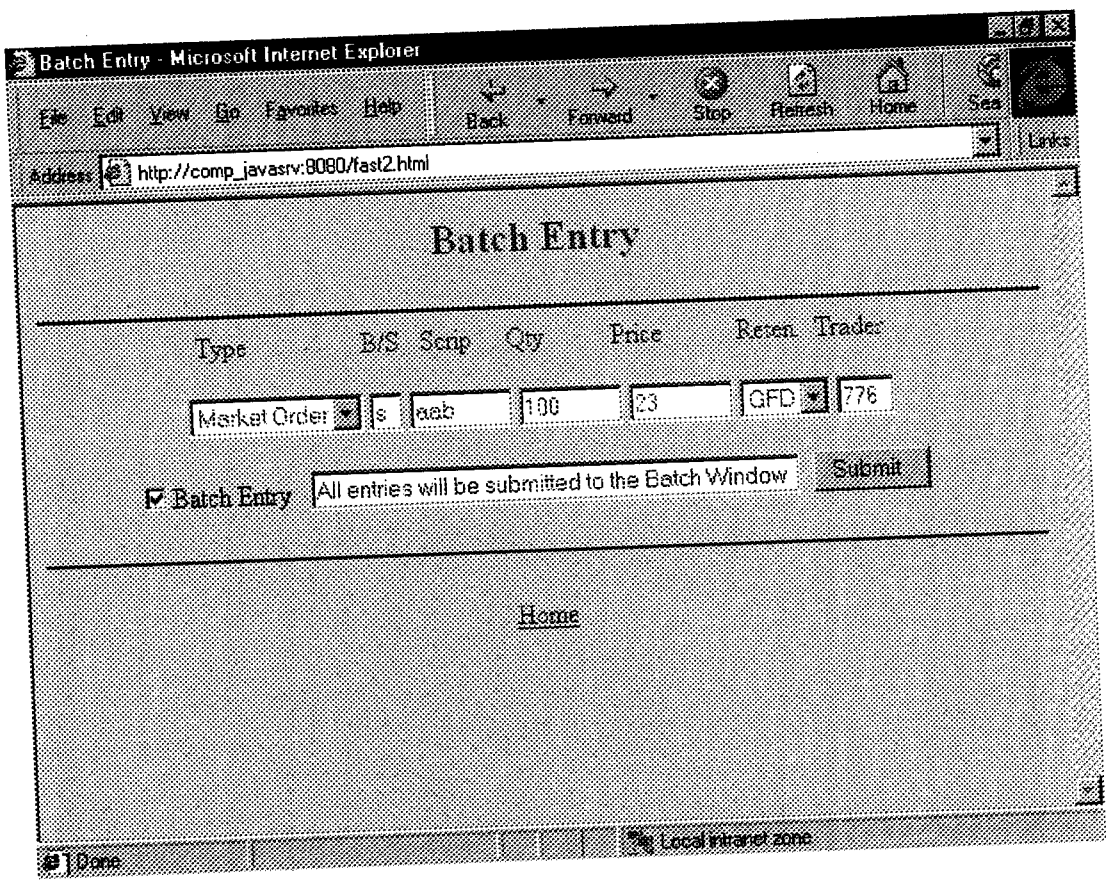
Broker's Options



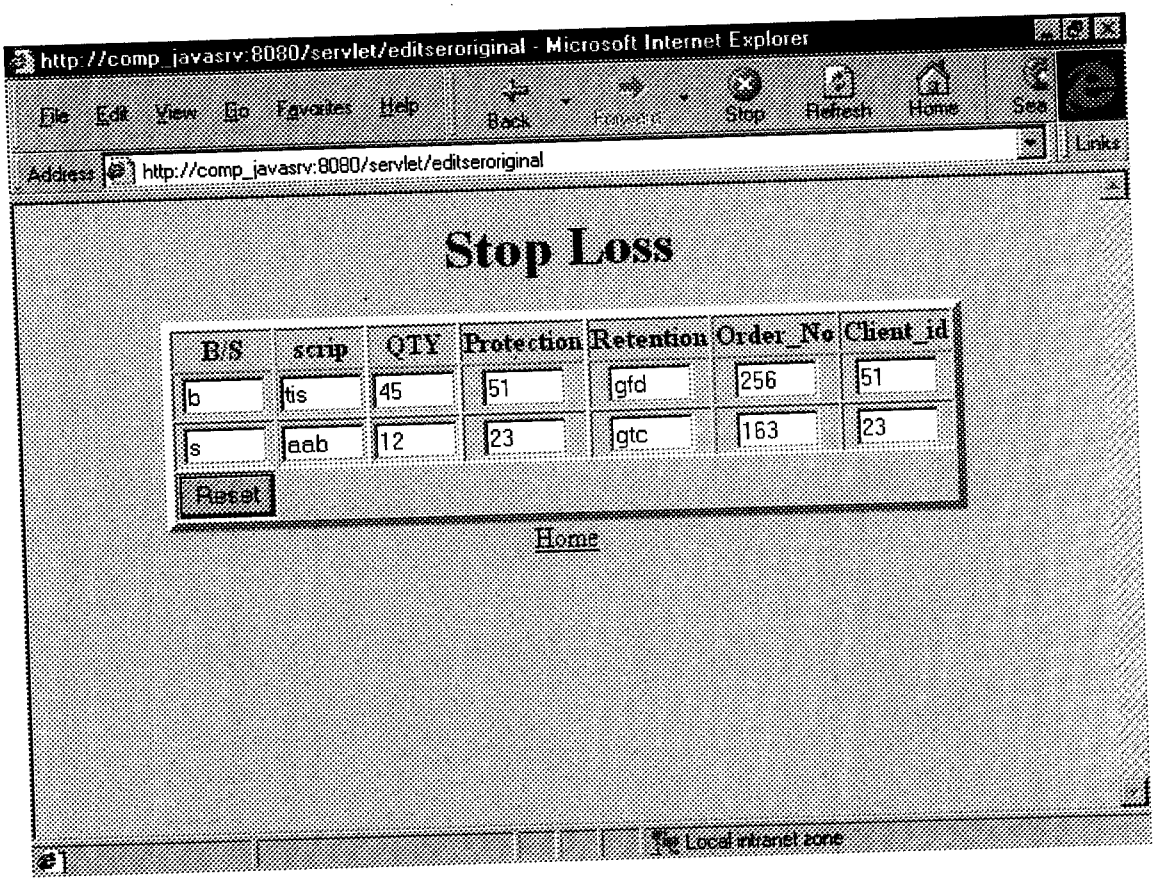
Fast Entry Screen



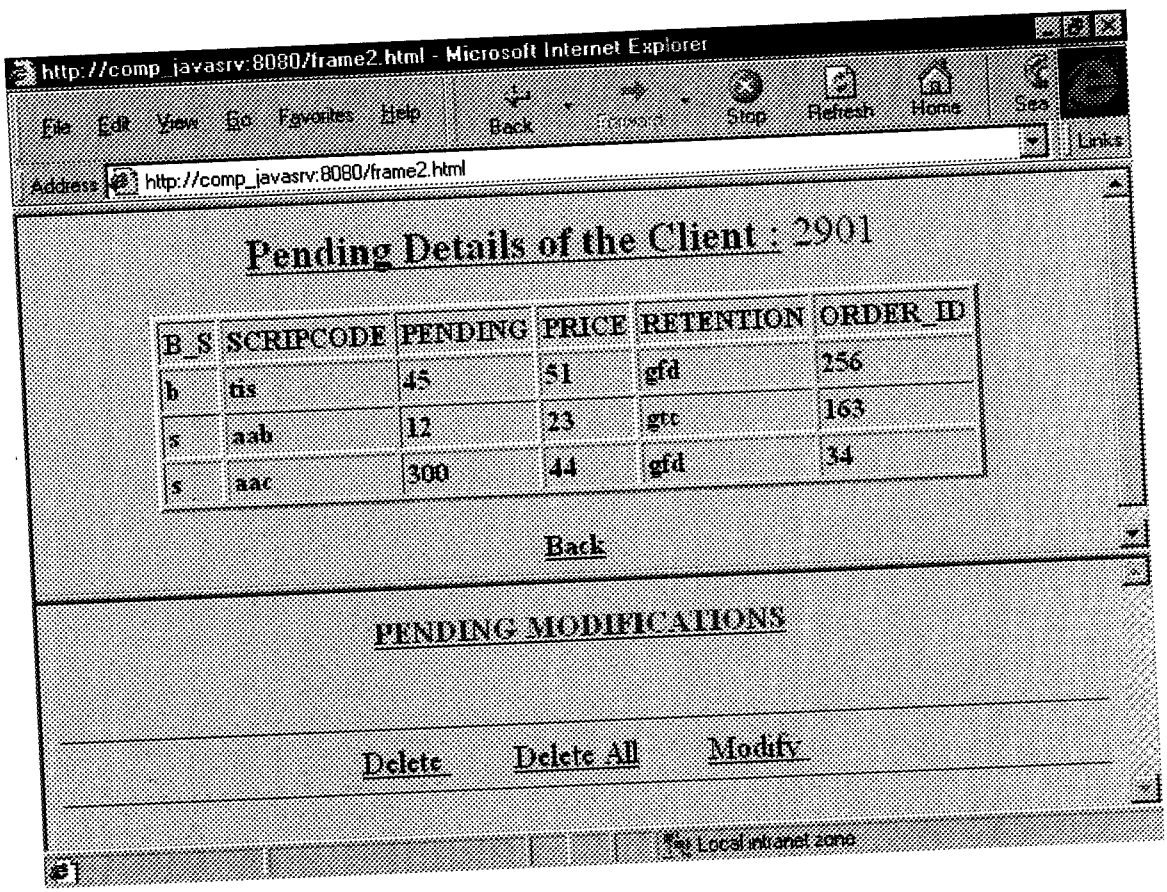
Batch Entry Screen



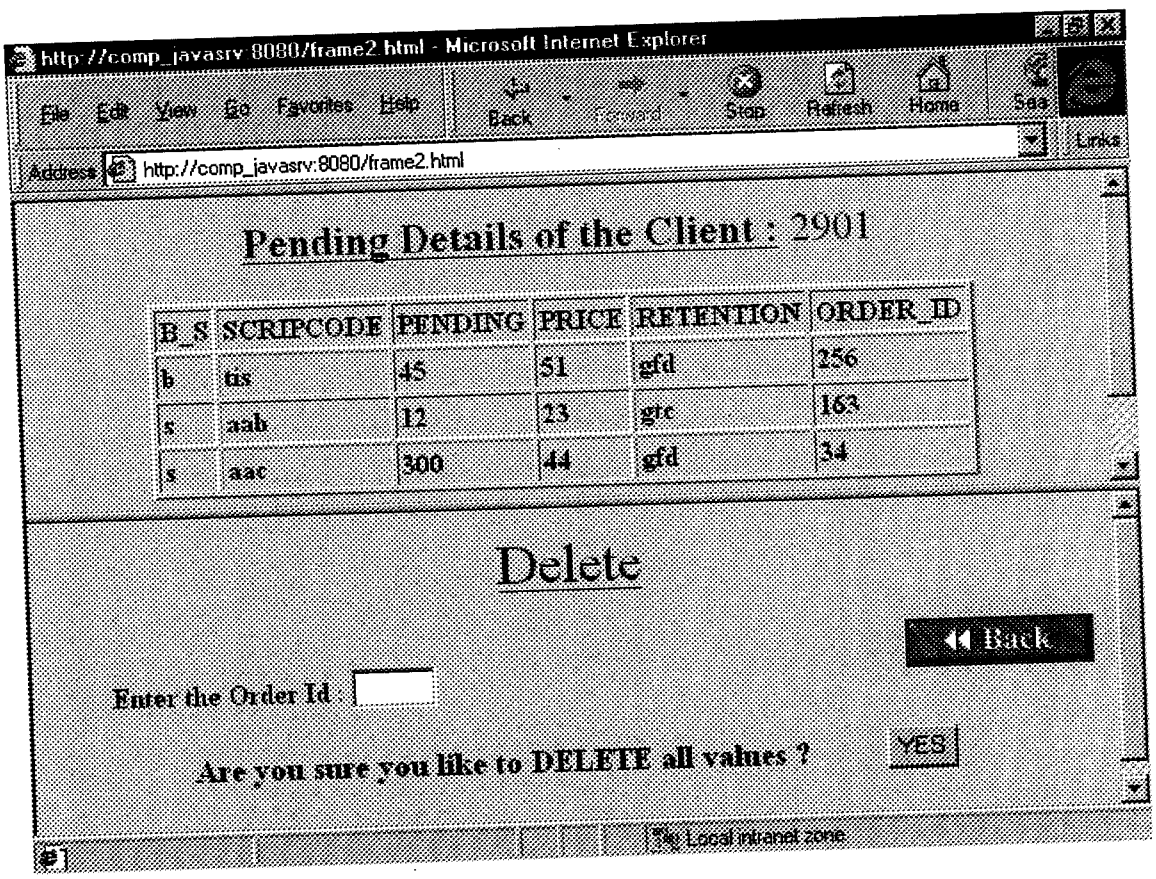
Stop Loss Screen



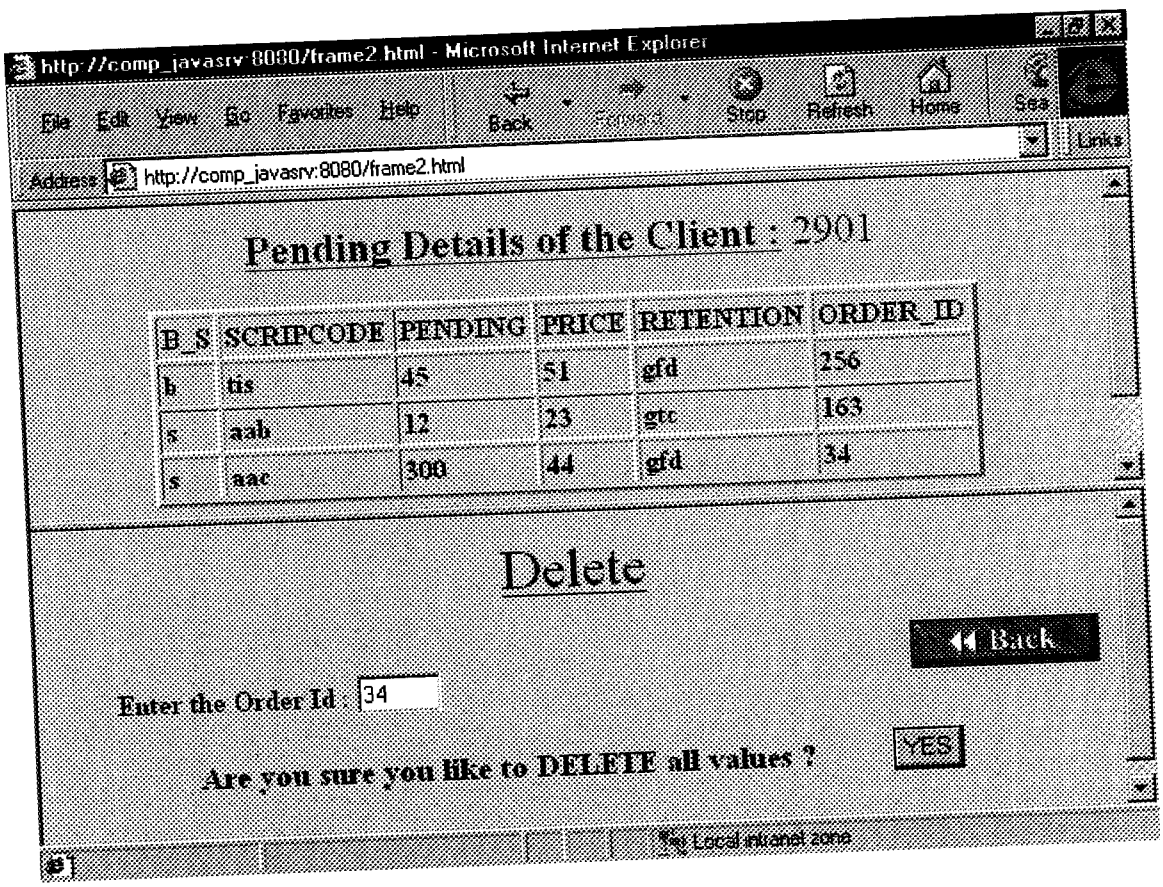
PENDING DETAILS



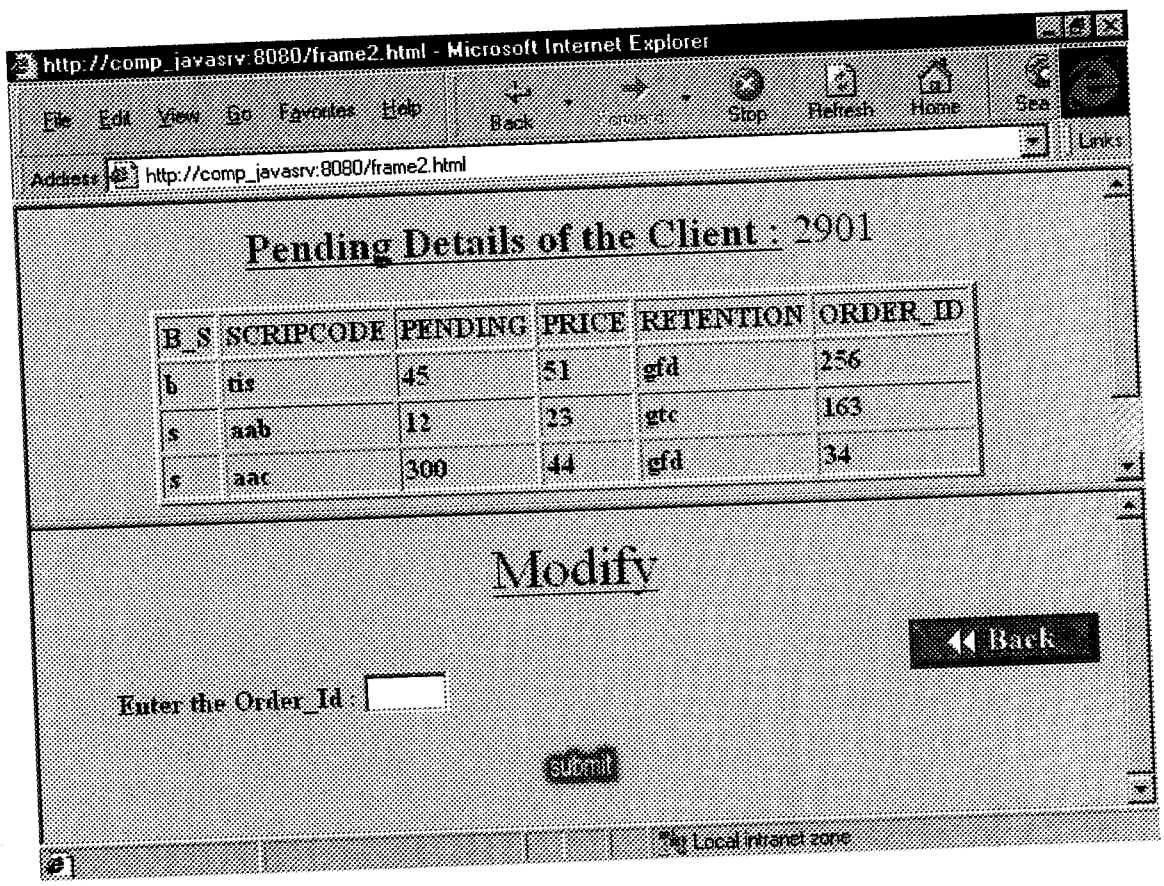
DELETE SCREEN



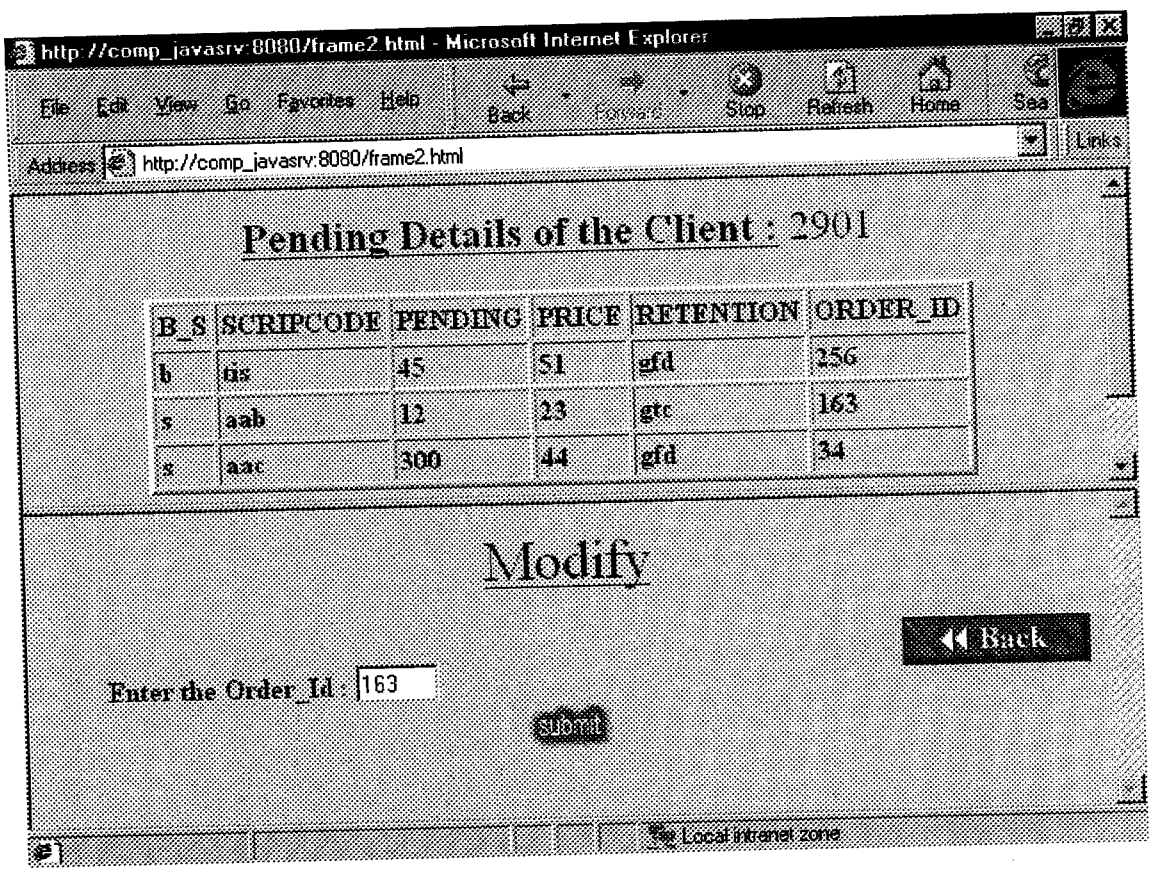
Delete Option



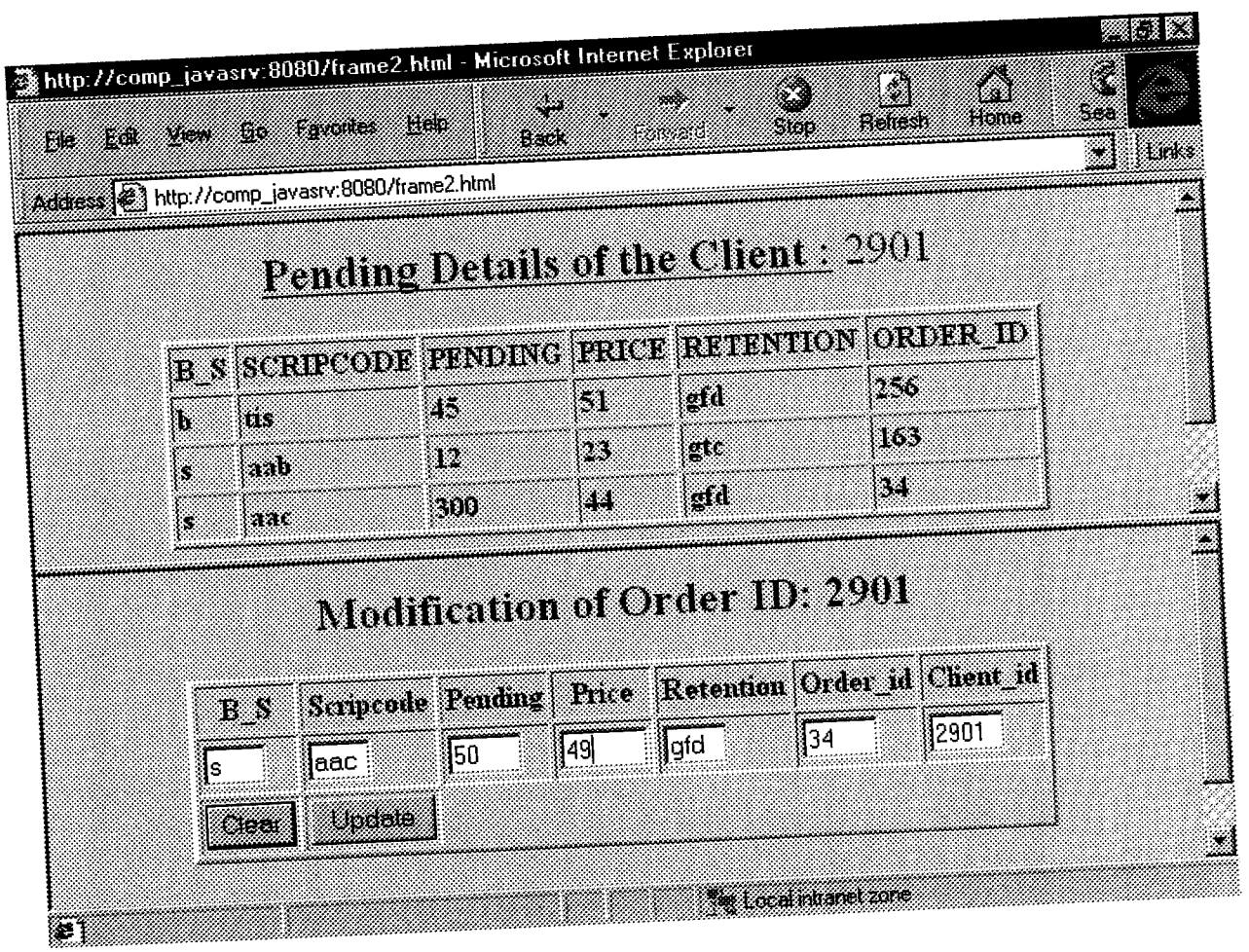
Modify Screen

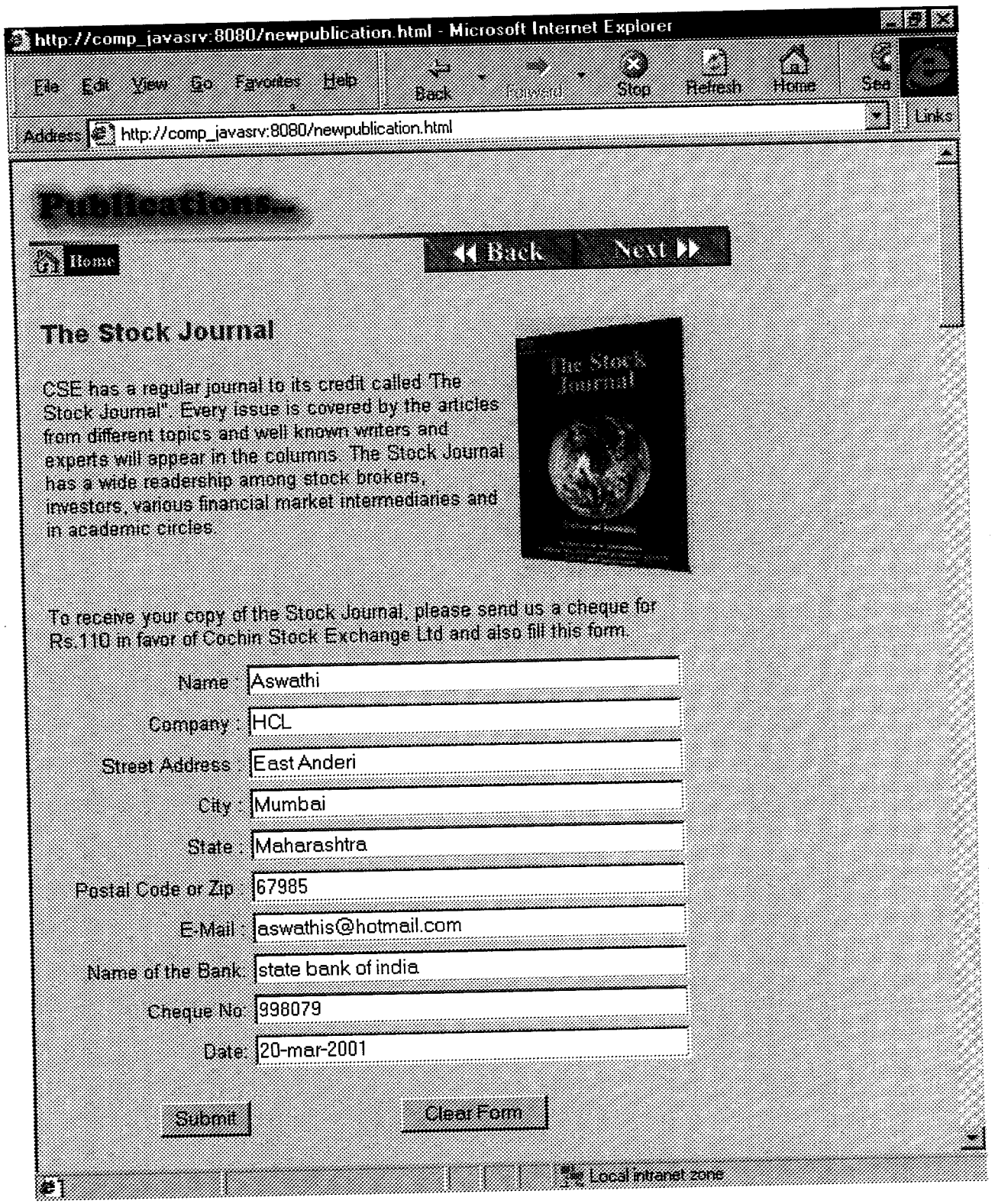


Modification



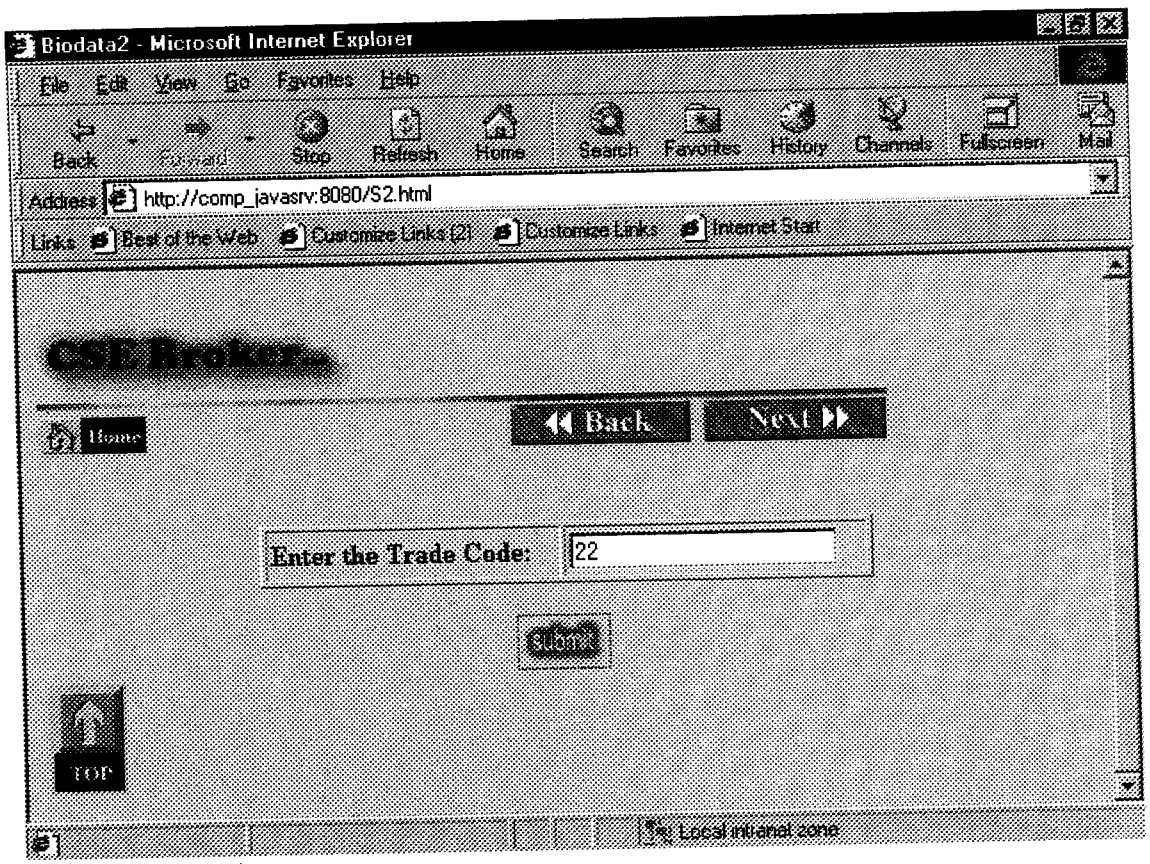
MODIFICATION



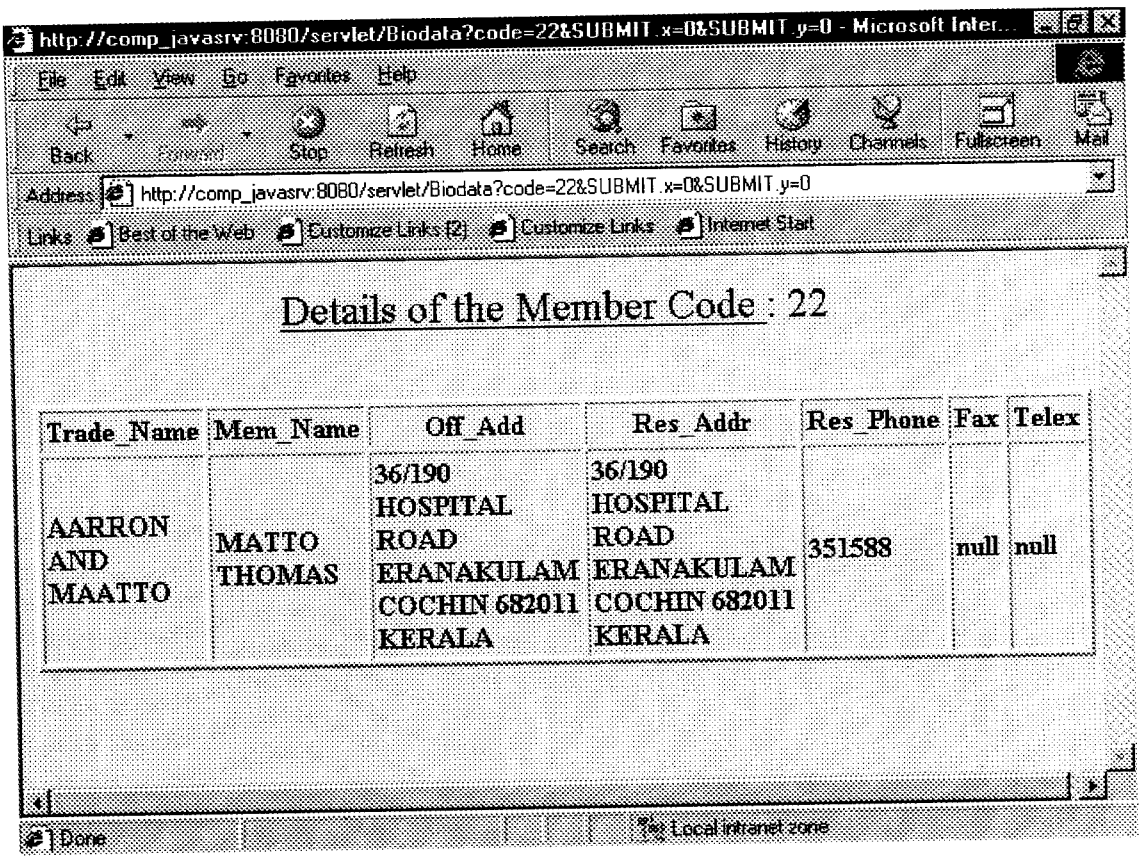


Publication Screen

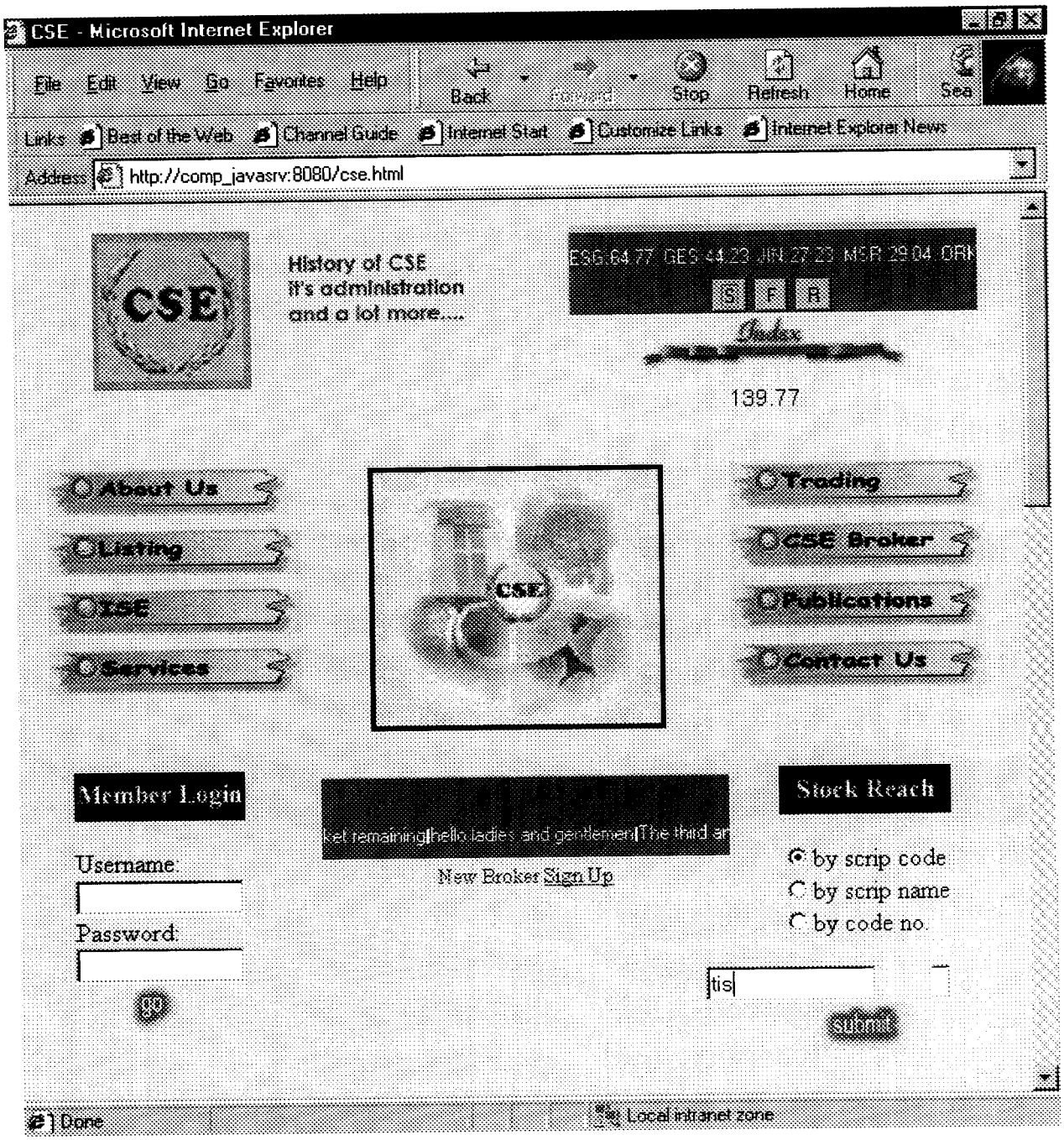
TRADER ENTRY



TRADER DETAILS



SCRIP CODE ENTRY



DETAILS OF SCRIP CODE