SOFTWARE DESIGN DOCUMENT

Group 11

Online Trading System

Software Design Document

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1. INTRODUCTION

1.1 Purpose

This software design document target introducing a detailed view on the whole design about the various subsystems and layers in the “Online Trading System”. The main purposes are that all the software requirements will be figured out in the system design, development of system architecture, capability of the system to adapt to the environment, improving its performance and divide the framework design into modules and functions.

1.2 Scope

This project is to develop the subsystems for the “Online Trading System”. The scope of the various functions are:

- To give the traders a helpful and viable approach to manage stocks.
- Friendly interfaces.
- The view of the databases are highly ensured.
- The traders are given complete control over their portfolio.
- Providing a hassle free environment for the traders and brokers through this software.

1.3 Overview

The organisation of this document is listed below:

Section-2:

System Overview - Gives the general description of the functionality and design of the system.

Section-3:

System Architecture - Contains the various diagrams describing the relationship between the subsystems and their functionalities.

Section-4:

Data Design - Description on the major data or system entities like trader, admin, broker.

Section-5:

Component Design - Function description of each component in PDL or pseudocode.

Section-6:

Human Interface Design - Overview of user interface (functionalities and screenshots).

Section-7:

Requirements Matrix - Tabular form to show which components satisfy the functional requirements mentioned in the SRS.

Section-8:

Appendices – Provide supporting details for better understanding of this SDD

1.4 Reference Material

Document for further reference

IEEE Standard for Information Technology--Systems Design--Software Design Descriptions

1.5 Definitions and Acronyms

SRS – Software Requirements Specification

DFD – Data Flow Diagram

PDL – Procedural Description Language

OO – Object Oriented

2. SYSTEM OVERVIEW

Our System provides an appropriate platform for satisfying our present customer specific objectives .We would be able to make stock trading super efficient and user friendly in every possible way for our customers for very safe and easy transactions. We have four main user interfaces :

1)Trader

2)Admin

3)Broker

4)Bank

Our Software application has simple interface implementation and at the same time possesses a great aesthetic appeal. We have used the latest available UI/UX design for design implementation . Our System is strictly password protected so,

The user and admin would be receiving alerts if any security breaches take place.

As we have four user interfaces , trader and broker users can sign up and log in through our system. They can buy, sell stocks and we have provided several features like stock watchlist in which users can follow their favourite stocks and additional current financial outbreaking stock news is also provided at our menu so that users can be aware of that.

Admin users have access to all the user data and transactions to monitor the system properly to prevent data misuse and data leakage.

The final most user is bank and they provide revenue generation, maintain all user transactions and validate bank details of users for safe transactions. Our System has three modules - class modules, transaction module and user module. Trader user interface has access to class module and transaction module,Admin user interface has access to class module,transaction module and user and Broker and Bank user interface has access to only transaction module.

3. SYSTEM ARCHITECTURE

3.1 Architectural Design

The diagram below shows the major subsystems and data repositories and their interconnections.

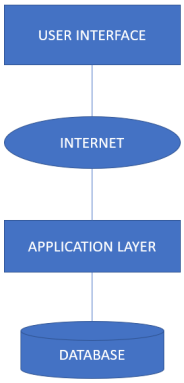


Figure 1: Block diagram for Trading system

3.1.1 The database layer

The database layer which is called as a tier is used to store all the user information such as their profiles, details regarding their trading business and also their history details.

3.1.2 The application service layer

The application service layer is the core of this three-layer structure. The functionality of the system and the way it works is handled in this layer. This layer interacts with the database and updates the information which is returned by the top layer. The system calls are handled by this layer.

3.1.3 The user interface layer

The user interface layer is one which basically interacts with the user. It runs on a remote computer and as the user requests for the details it sends a request to the server for processing and corresponding reply is shown to the user.

3.2 Decomposition Description

The top level view of DFD shows the main actors interacting with the system

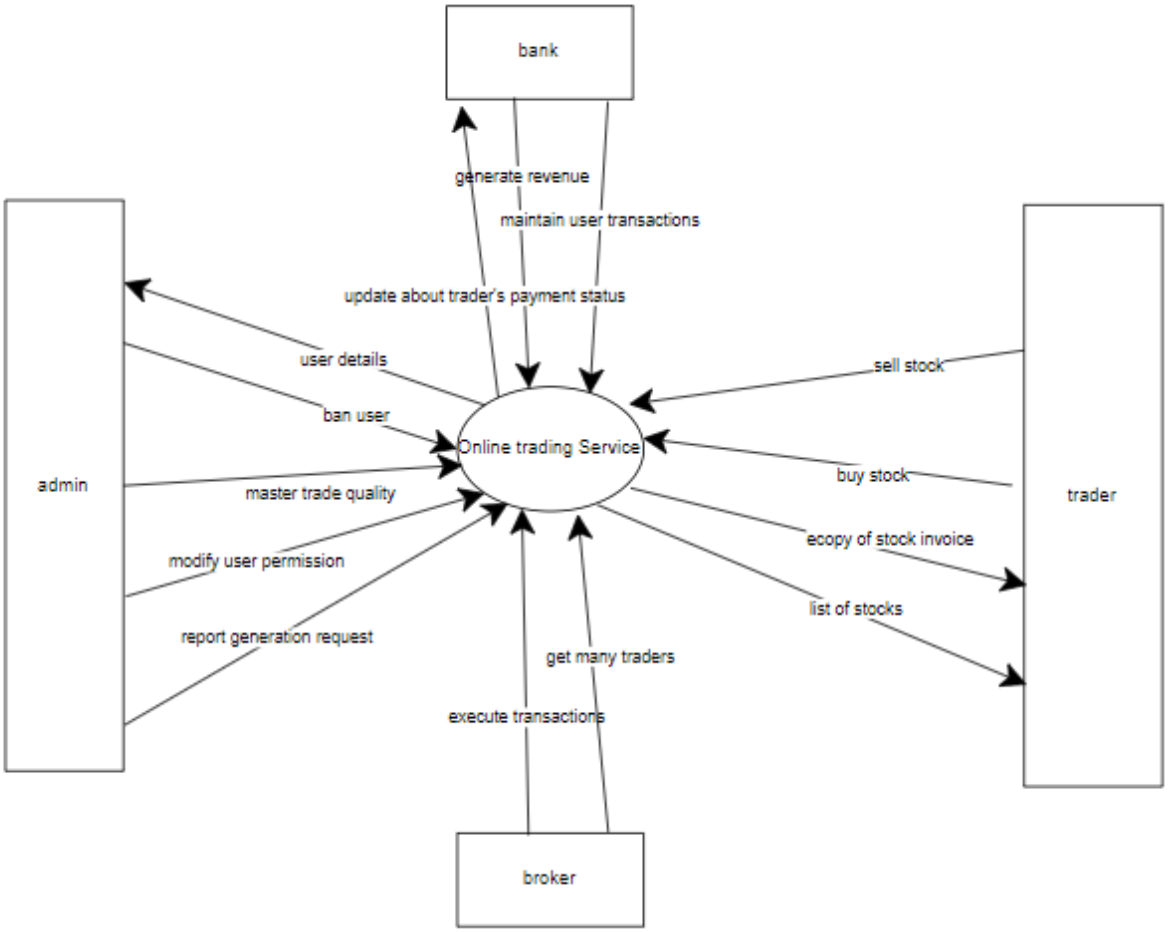


Figure 2: Top Level DFD for Online trading system

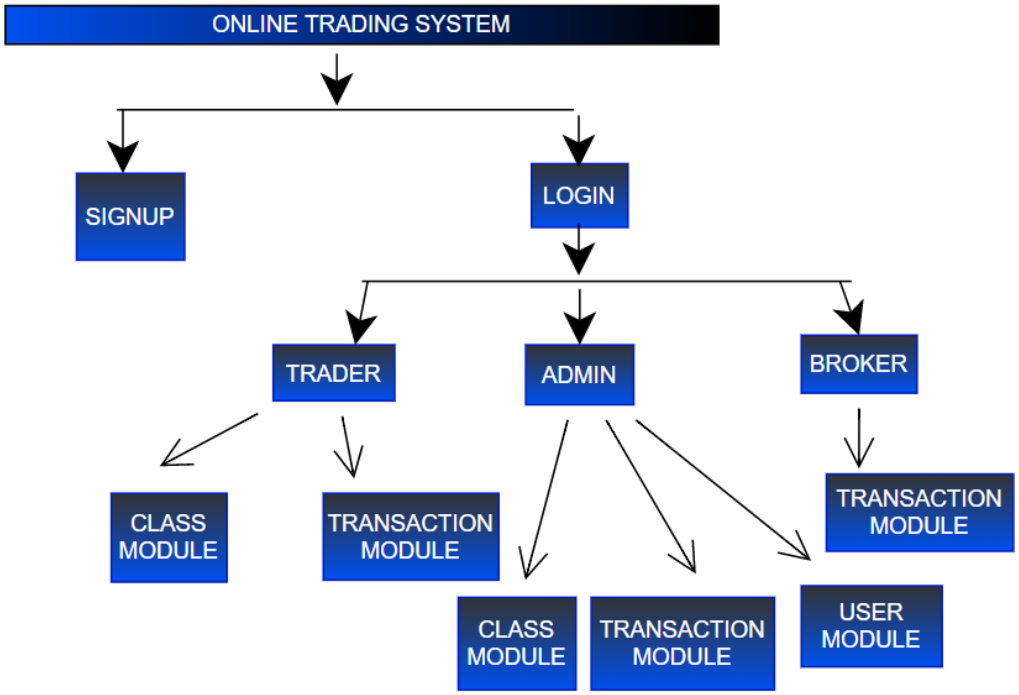


Figure 3: Decompositional tree for Online trading system

3.3 Design Rationale

Figure 1 describes the architectural overview chosen for the Online Trading Website. As seen from the diagram, the User interacts with the application services and accesses the database through the Internet service.

This three-tier architecture has its logical and physical separation of functionality. Each tier can run on a separate operating system and server platform - e.g., web server, application server, database server - that best fits its functional requirements. And each tier runs on at least one dedicated server

hardware or virtual server, so the services of each tier can be customized and optimized without impacting the other tiers.

This architecture is used as it is based on users of multiple levels and our design abstracts the non-significant details to the user and makes it user-convenient to use.

We choose this type of architecture to make the traders, brokers to feel comfortable in using our website and also to get help from our team whenever necessary.

4. DATA DESIGN

4.1 Data Description

The data is stored using MySQL by Oracle Corporation, it will be stored in as table of records.

4.2 Data Dictionary

1. **Trader**

Description: The trader entity is used to represent a trader in the system.

Attributes: name, username, password, sell stock, buy stock , ecopy of stock invoice, list of stocks

2. **Bank:**

Description: This entity is to manage financial transactions in the system.

Attributes: generate revenue, maintain user transactions, update about trader's payment status.

3.**Broker:**

Description: Broker entity is used to exchange trade items in the system.

Attributes: get many traders, execute transactions.

4. **Admin:**

Description: Admin is used to manage the system and has full access to system.

Attributes: user details, ban user, master trade quality, modify user permission, report generation request.

5. COMPONENT DESIGN

Here is the list of summaries provided from the functional description described in 3rd section which is from the decomposition tree of online trading systems.

From the Decomposition tree described in 3.2 diagram, Data flow is clearly given.

Here , we are going to see a few more details in a more systematic way via pseudocode.

So, there are two main functions: **Sign Up** and **Login**. Let's see the first two.

1)SignUp

Start

go to Login/SignUp Page

if Option is SignUp

Enter Username and Password along with other user informations for profile

Verification

if verification and account creation finished

finish SignUp

go to Login page

else

print Error SignUp

else if Option is Login

go to Login page

End

2) Login

Start

go to Login Page

if Username and Password exists

if Username and Password matches

```
            finish Login
            if user is Trader
                go to Trader interface
            else  if user is Admin
                go to Admin interface
            else  if user is Broker
                go to Broker interface
        else
            print  Error Login
    else
    print  Error Login
    End
```

Now let's see the subfunctions contained in the Login function.

Trader has access to the Class module and Transaction module.

Admin has access to the Class module ,Transaction module and User module.

Broker has access to the transaction module.

3) Class module

Start

if User is Trader

view/add/edit/delete User account

view list of stocks

buy available stocks

sell stocks

obtain e-copy of stock invoice

else if User is Admin

view/add/edit/delete User account

view/add/edit stocks

view and verify User information at any time

ensure safe trade quality

modify User permissions

control transactions

else if User is Broker

view/add/edit/delete User account

view trader users

buy and sell stocks based on client(trader) permission

execute transactions

else if User is Bank

Generate revenue

Validate bank details of users

Maintain user transactions

Send OTP via sms/email to client(trader,broker)

Confirm payment transaction

End

4)Transaction module

Start

if Transaction request received

if Transaction confirmed

Get User bank details

Verify All User details

Proceed Transaction

Check for proper connection

if Transaction successful

print Transaction Success

finish Transaction

else

print Transaction failed

else

print Transaction error

else

print Transaction error

End

5)User module

Start

if User logged in and Signed Up

Can view/add/edit/delete User account information

View transaction history

Raise feedback/complaints regarding System

Execute transactions

Buy/Sell Stocks

Sync Bank account

End

6. HUMAN INTERFACE DESIGN

6.1 Overview of User Interface

The User has to log in to access the Trading application. On the login page, the user is required to enter a registered email address and password. If the user is new to the application the user has to sign up to the Trading website. On the signup page, the user is required to enter some necessary details such as name, email, password. The user is also required to give some field of interest based on which the user can get Stock recommendations. After giving the details and creating an account the user can log in using the email and password.

QUOTES PAGE:

- The system will display all currently owned stock quotes by querying a database on a regular basis.
- The system will display all previously owned stock quotes by querying a database on a regular basis.
- The system will display all watched stock quotes by querying a database on a regular basis.
- User will proceed to add/remove quotes from his/her watched list by providing the following fields:
    - Action: {Click Button: Add or Remove}
    - Stock Symbol: {Stock Symbol to be added only}

LOGIN PAGE

- User will enter user name and password then press submit.
- If the user does not have an account, a link to create account will be provided.
- If the user's name and password fields are not provided, the user will be notified to fill in the appropriate fields.

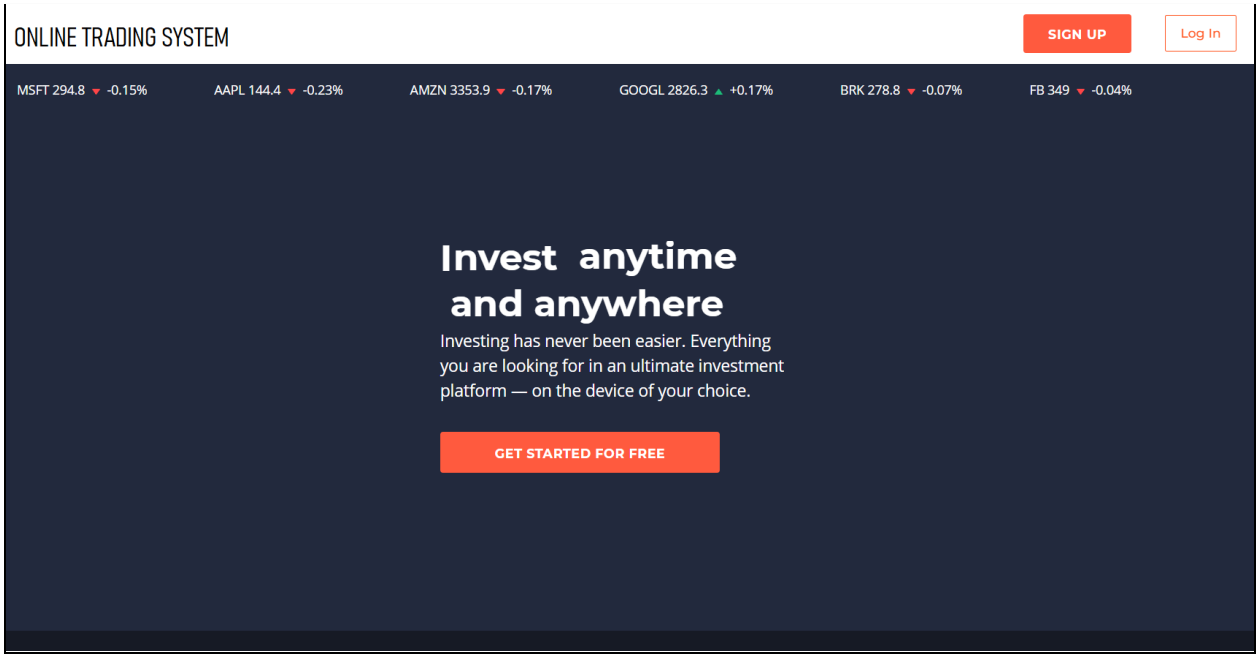
- If the user's name is a match to one in the database, then the password will also be checked.
- If the user's name or password, the user will be asked to verify and resubmit their user's name and password

ACCOUNT MAINTENANCE PAGE:

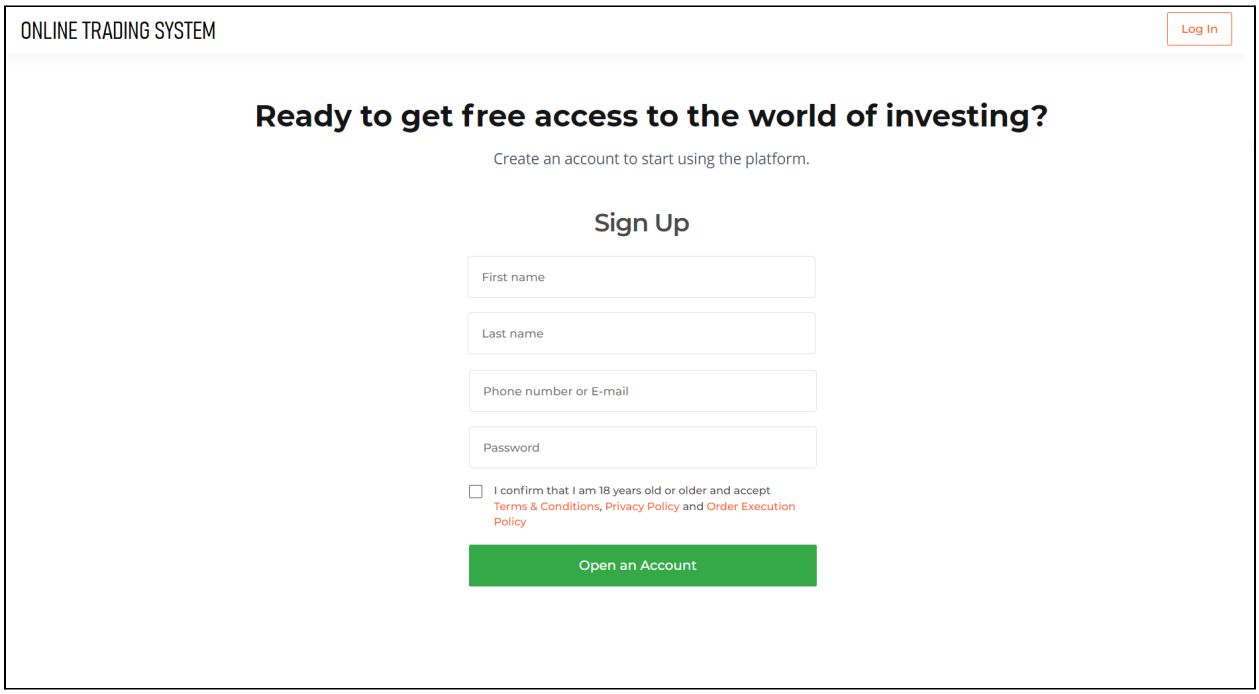
- "Account Maintenance" page will display an option to "Close Account".
- Once the user selects the option to "Close Account" the system will ask the user if he wishes to sell all stocks. If the user confirms, the system will sell all stocks at market price. If user cancels the system will display message "You must sell all stocks to close account"
- User will be asked to "confirm" or "cancel" closing account.
- If "Confirm" is selected the user will be deleted from the database, a confirmation message will be displayed and user will be logged out and taken to "thank you" page.
- If "Cancel" is selected user will be taken back to the "Account Maintenance" page.

6.2 Screen Images

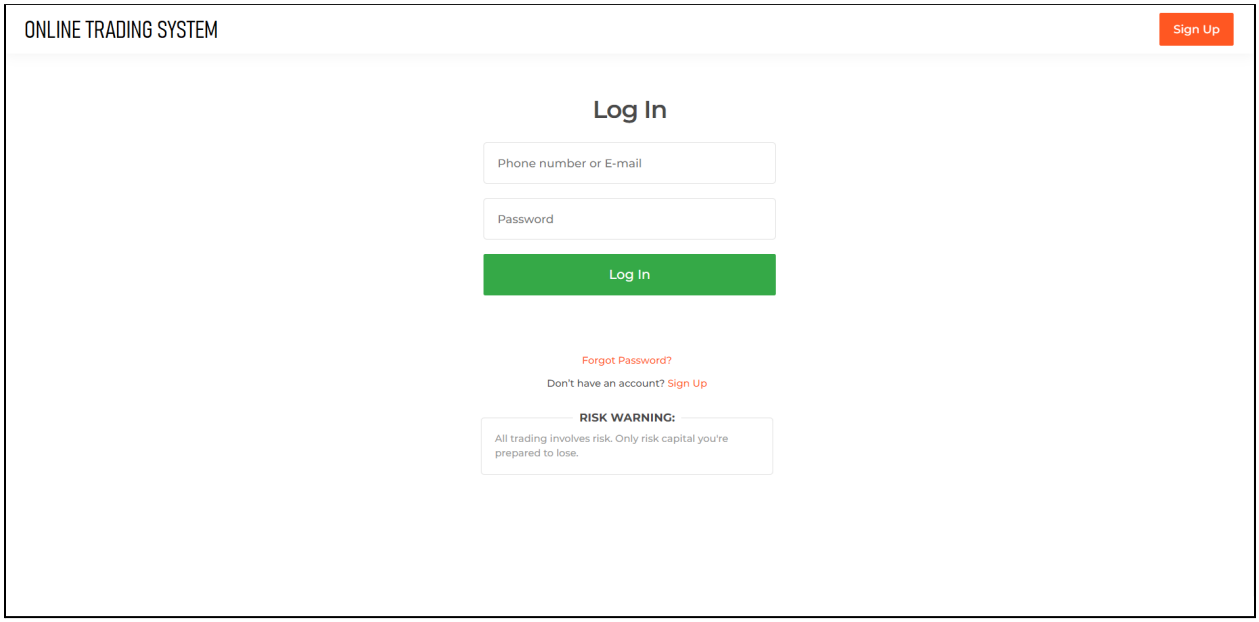
Home Page:



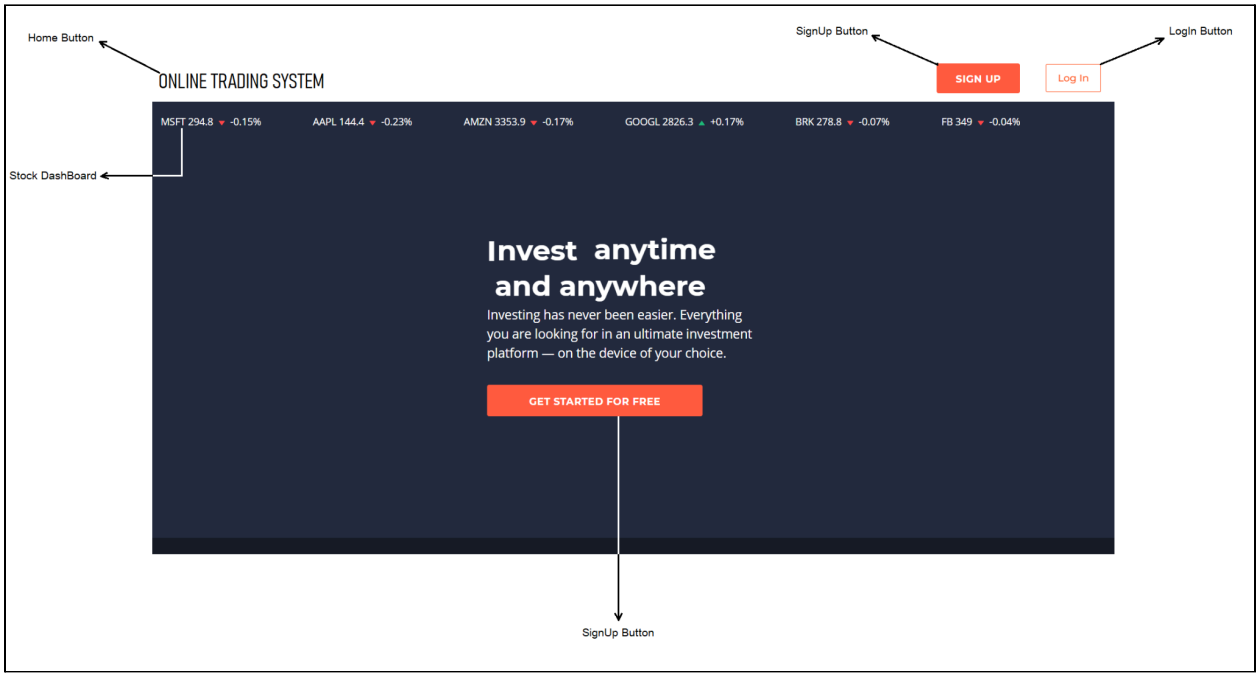
Signup Page:



Login Page:



6.3 Screen Objects and Actions:



- Home Button: It diverts user to the starting/initial page of the application.
- Stock Dashboard: It is an **operational analysis tool** that displays the real time variations of the stock market.
- Signup Button: This button is a link to create account page and should be used in case the user in new or doesn't have an account. Details like Name, contact number & Email will be entered as well as password can be set.
- Login button redirects the user to login page where username and password should be used to sign in to personalized dashboard and quotes page.

7.REQUIREMENT MATRIX

QUOTES PAGE:

Requirement Title:	Quotes
Short description:	Display currently owned stock quotes, previously owned stock quotes, watched stock quotes and quote lookup
Description:	● All quotes will be updated in real time as the user uses the page. ● The system will display all currently owned stock quotes by querying a database on a regular basis. ● The system will automatically move a stock to the current list when it is bought initially
Pre-Conditions:	● The user must logon before performing this function ● The database must be loaded at user login
Post Conditions:	● The quotes database will be saved when the user logs off
Other attributes:	● Make sure multiple clicks does not yield multiple adds ● A link to symbol looks up will be provided in case the uses do not know the stock symbol.

LOGIN PAGE:

Requirement Title:	Log on
Short description:	Log on to the system
Description:	● User will enter user name and password then press submit. ● If the user does not have an account, a link to create account will be provided.
Pre-Conditions:	There must not be a user currently logged in to the system from that computer
Post Conditions:	The user will be taken back to the main user screen when he successfully logs in
Other attributes:	The user will only be allowed up to four attempts to login. The system will offer to reset password after the fourth attempt

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