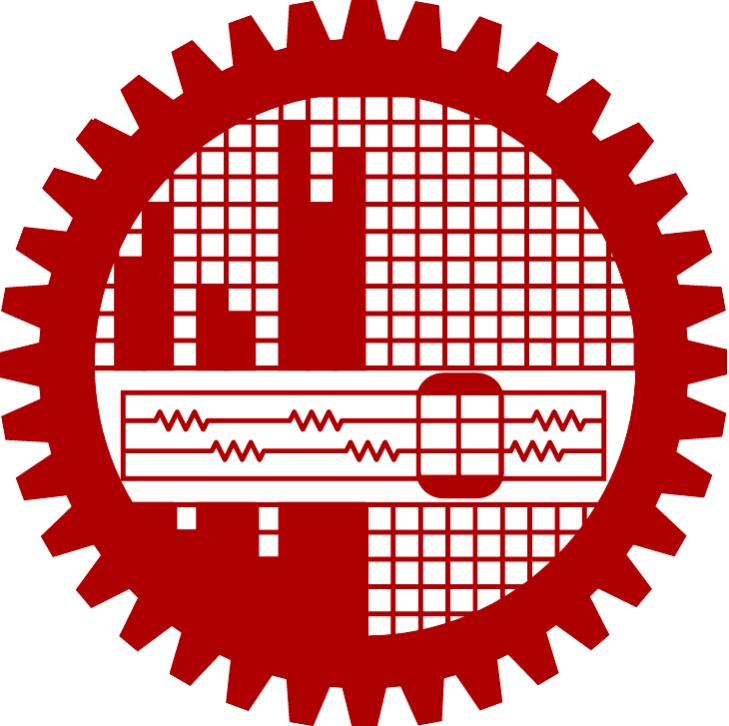
**eStockBroker**

**Stock Market Analysis and Trading Software**

**(Use Case Analysis)**



**Information System Design Project**

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**Actors**

The system has three actors, namely:

1. Trader

2. Broker House

3. Stock Exchange

**Actors Glossary**

The actor’s glossary shows the short codes and activity scopes of every actor.

|  |  |  |
| --- | --- | --- |
| **Actor** | **Short-hand** | **Activity scope** |
| Trader | TRD | 1. making and managing user account 2. view stock 3. buy and sell stock |
| Broker House | BH | 1. provides stock listing from database   b) analysis of stock performance  c) assign unique id to every transaction  d) handle invalid orders |
| Stock Exchange | SE | a) provides BH access to database  b) updates list in real-time |
| Bank | BA | a) verifies transactions made by trader b) completes the transactions |

**Subsystems:** There are four subsystems, viz-

1. User Profile Management  
2. Real-Time Stock Listing

3. Stock Analysis System

4. Transaction Handling System

# User profile system

## **Use-case Glossary:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Use-Case ID | Name | Description | Participant actors and roles | |
| 1.1 | Sign-up/login | Signing up & logging in into an account | TRD signs up and logs in into his/her account, BH gives interface | |
| 1.2 | Quote stock | Displays buy price, sell price and relevant analyses of selected stock after displaying all stocks | TRD clicks on the company name to see the price per share, BH provides listing | |
| 1.3 | View owned stock | View stocks bought and held by user | TRD views his owned securities, BH stores the info | |
| 1.4 | Buy/Sell stock | Buy or sell stock in a company | TRD buys or sells stocks, BH receives transaction |
| 1.5 | View dividend | Show profits paid on owned stock | TRD views the profit distributed on held securities, BH provides info | |



***Use Case Narrative:***This system features how the trader will make and use their profile and what functionalities they will get.

**1.1: Sign-up/Login  
Typical course of event:**A traders can create a profile in this system easily only by providing an email id, which is verified by the Broker House server. They can login into this system using that id and enjoy all the features from his/her profile.

|  |  |
| --- | --- |
| **Use-Case name** | **Sign-up/Login** |
| Use-Case ID | 1.1 |
| Priority | High |
| Primary Business Actor | TRD |
| Primary System Actor | BH |
| Description | User creates new account with email id and then uses that id to login. |
| Trigger | By TRD |

**Actors:**  TRD, BH **Documentation:**Conclusion: Concludes when the request to make an account is made.  
Post-condition: Confirm the user about his account creation and log him in.  
Implementation issues: A form will be provided in the client GUI to allow users to sign-up or login.

**1.2: Quote Stock  
Typical course of event:**First all stocks of the companies trading in the stock market are displayed. When the trader clicks on the name of a company he will be provided a list of available types of stocks of that company, their latest buy and sell prices and various stock analyses by the Broker server.

|  |  |
| --- | --- |
| **Use-Case name** | **Quote Stock** |
| Use-Case ID | 1.2 |
| Priority | High |
| Primary Business Actor | TRD |
| External Server Actor | BH |
| Description | TRD clicks on name of company and gets detailed info about that stock, e.g. buy/sell price, EPS, P/E ratio etc. |
| Trigger | By TRD |

**Actors:** TRD, BH **Documentation:**Conclusion: When trader clicks on a stock.  
Post-condition: User is provided a list of available types of stocks of that company, their latest buy and sell prices and various stock analyses.  
Implementation issues: The user will access stocks through the client GUI which lists all the stocks.

**1.3: View owned stock**

**Typical course of event:**The user will be able to view the stocks he has already bought, the price at which he has bought them, date of purchase and the current buying and selling price of that stock in the market.

|  |  |
| --- | --- |
| **Use-Case name** | **View owned stock** |
| Use-Case ID | 1.3 |
| Priority | High |
| Primary Business Actor | Trader(TRD) |
| External Server Actor | BH |
| Description | TRD will be able to view his bought stocks by clicking a panel |
| Trigger | By TRD |

**Actors:** BH, TRD **Documentation:**Conclusion: When user clicks the owned stocks panel in the client GUI.  
Post-condition: User will be provided with a listing of the stocks he owns and the other information mentioned above.  
Implementation issues: It will be a part of the user GUI.

**1.4: Trade Stock**This option will allow the trader to buy or sell his stock in the stock market. Whenever the trader decides to buy or sell off his shares, a request to carry out the operation is sent back to the Broker House server which then verifies and completes the request.

It takes 3 working days (T+3) for a stock transaction to check out but the transfers themselves are instant and irreversible.

|  |  |
| --- | --- |
| **Use-Case name** | **Trade stock** |
| Use-Case ID | 1.4 |
| Priority | High |
| Primary Business Actor | Trader(TRD) |
| External Receiver Actor | BH |
| Description | Trader sends to request to buy/sell shares, BH verifies and completes that request |
| Trigger | By TRD |

**Actors:** BH,TRD **Documentation:**Conclusion: When user chooses the buy or sell option on a specific share.  
Post-condition: Amount of purchase or sale is asked and then the request is sent to the server for verification.  
Implementation issues: Part of the client GUI.

**1.5: View dividend**The user can see the income generated against the stocks he owns up to this point as well as the amount that he has received on the current day.

|  |  |
| --- | --- |
| **Use-Case name** | **View dividend** |
| Use-Case ID | 1.5 |
| Priority | High |
| Primary Business Actor | Trader(TRD) |
| External Server Actor | BH |
| Description | TRD requests to view his dividends and BH sends the data. |
| Trigger | By TRD |

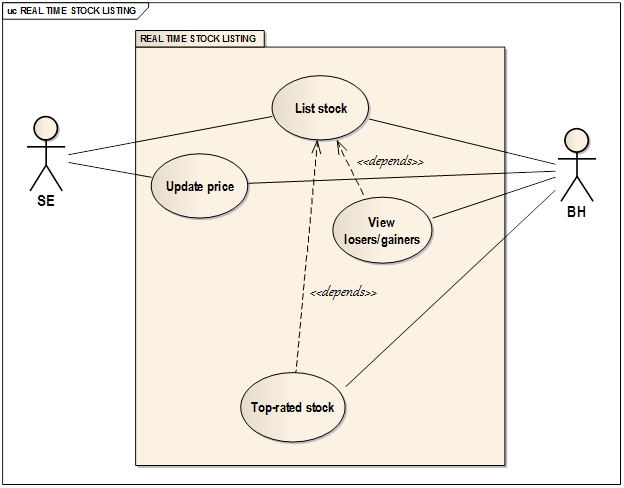
**Actors:** BH,TRD

**Documentation:**Conclusion: When user chooses to view his dividend.  
Post-condition: Broker server sends the dividend data and user sees it.  
Implementation issues: Part of the client GUI.

# Real Time Stock Listing

## **Use-case Glossary:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Use-Case ID | Name | Description | Participant actors and roles | |
| 2.1 | List stock | Generate list of all companies trading in the SE | BH generates the list with SE database | |
| 2.2 | Update price | Updates the bid/sell price and other data of shares | BH updates the list every 30 seconds with SE data | |
| 2.3 | View losers/gainers | Compares current and closing price of previous day to segregate stocks | BH compares saved data of previous day with real-time data of SE | |
| 2.4 | Top-rated stock | Lists the ten shares having the best current EPS rating (earnings-per-share) | BH evaluates EPS from net income divided by number of shares |



***Use case narrative:***

This subsystem comprises the data that is collected from the Stock Exchange and used in real-time to provide instant details.

**2.1: List Stock**The BH requests the SE server to send the list of publicly traded companies on its index at the start of a working day and then stores it in its own server after receiving the data.

|  |  |
| --- | --- |
| **Use-Case name** | **List stock** |
| Use-Case ID | 2.1 |
| Priority | High |
| Primary Business Actor | BH |
| External Server Actor | SE |
| Description | BH requests SE for list of companies in SE index and then stores it locally at start of working day |
| Trigger | By BH |

**Actors:** BH, SE **Documentation:**Conclusion: Concludes when BH requests SE for stock listing.  
Post-condition: SE sends BH the requested data and BH stores it in its own database.  
Implementation issues: There will be a database in BH server to store this information.

**2.2: Update price**

The BH will periodically(30s interval) request the SE to send it current buy/sell price of a stock if there has been any change within that time and then updates the value in its database accordingly.

|  |  |
| --- | --- |
| **Use-Case name** | **Update price** |
| Use-Case ID | 2.2 |
| Priority | High |
| Primary Business Actor | BH |
| External Server Actor | SE |
| Description | BH requests SE for update and after getting the data, updates value in its database |
| Trigger | By BH |

**Actors:** BH, SE **Documentation:**Conclusion: When BH sends update requests.  
Post-condition: If there is change in any stock price within last 30 seconds, the data is sent back and updated in BH server.  
Implementation issues: Database will be provided in BH side for storage.

**2.3: View losers/gainers**This module will provide a listing of all the companies whose prices have fallen or risen in comparison to the previous day. It will use the real-time data in relation with data saved from the day before.

|  |  |
| --- | --- |
| **Use-Case name** | **View losers/gainers** |
| Use-Case ID | 2.3 |
| Priority | Medium |
| Primary Business Actor | BH |
| Description | BH uses data collected by list stock module with previous day’s data to make the required list |
| Trigger | By BH |

**Actors:** BH **Documentation:**Conclusion: When BH sends the command to view losers/gainers  
Post-condition: List of the day’s losers/gainers is brought up for the BH.  
Implementation issues: Database will be provided in BH side for storage.

**2.4: Top-Rated Stock**Lists the top ten stocks in descending order of EPS or Earnings-Per-Share. EPS is generally defined as the income generated on a single share over one year and is calculated by dividing net income of a company by its number of outstanding shares.

|  |  |
| --- | --- |
| **Use-Case name** | **Top-Rated Stock** |
| Use-Case ID | 2.4 |
| Priority | Medium |
| Primary Business Actor | BH |
| Description | BH calculates EPS of all companies and then sorts them and displays the greatest ten |
| Trigger | By BH |

**Actors:** BH **Documentation:**Conclusion: When BH sends the request.  
Post-condition: The top-rated stock for the day is shown for the BH.  
Implementation issues: Database will be provided in BH side for storage.

# Stock Analysis System

## **Use-case Glossary:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Use-Case ID | Name | Description | Participant actors and roles | |
| 3.1 | Graphical Analysis | Shows relative performance of a share on a curve | BH plots points on the curve on the basis of historical data | |
| 3.2 | Market Capitalization | Evaluate net worth of a company | BH calculates the share price times number of shares | |
| 3.3 | Market Portfolio | Evaluate monetary weight of a stock versus entire market | BH works out market cap of stock over cap of total market | |
| 3.4 | Earnings-per-share | Evaluate the income generated per share of a company | BH divides net income of a company over a year by number of shares | |
| 3.5 | Average dividend | Evaluate the expected profit paid per stock | BH aggregates dividend paid over time divided by time from historical data |
| 3.6 | P/E Ratio | Evaluate the ratio of buy price to EPS | BH divides the share buy price by its EPS | |



***Use case narrative:***

In this subsystem, the broker house evaluates many terms and expressions using historical data and provides graphical analysis of stock price fluctuations over an extended period of time.

**3.1: Graphical analysis**

Plots and displays a graph showing the long-term performance of a share to help the trader decide whether or not to buy the share.

|  |  |
| --- | --- |
| **Use-Case name** | **Graphical Analysis** |
| Use-Case ID | 3.1 |
| Priority | High |
| Primary Business Actor | BH |
| Description | BH plots points on the curve on the basis of historical data |
| Trigger | By BH |

**Actors:** BH **Documentation:**Conclusion: When BH is told to generate the graph.  
Post-condition: Graph is generated from the historical data stored in the database according to date.  
Implementation issues: Historical data will be needed which will be stored in a database.

**3.2: Market Capitalization**

The total market capitalization of a company, that is, the net worth of the company is assessed. This amount is obtained by multiplying the share price times the number of shares of that company.

|  |  |
| --- | --- |
| **Use-Case name** | **Market Capitalization** |
| Use-Case ID | 3.2 |
| Priority | High |
| Primary Business Actor | BH |
| Description | BH calculates the share price times number of shares |
| Trigger | By BH |

**Actors:** BH **Documentation:**Conclusion: When BH is asked to send Market Capitalization.  
Post-condition: The market capitalization is displayed.  
Implementation issues: Access to the number of shares and current share price needed.

**3.3: Market Portfolio**The market portfolio of a company is evaluated as the weighted value of the company over the value of all the companies trading in the stock exchange at that moment.

|  |  |
| --- | --- |
| **Use-Case name** | **Market Portfolio** |
| Use-Case ID | 3.3 |
| Priority | High |
| Primary Business Actor | BH |
| Description | BH works out market cap of stock over cap of total market |
| Trigger | By BH |

**Actors:** BH **Documentation:**Conclusion: When BH is asked to send Market Portfolio.  
Post-condition: Market Portfolio is displayed.  
Implementation issues: Access to the share numbers and price of all the companies in the SE.

**3.4: Earnings Per Share(EPS)**

Earnings-per-share or EPS is defined as the income generated on a single share of a company over a fixed period of time, usually a year. It is obtained by dividing net income of a company by the total number of shares.

|  |  |
| --- | --- |
| **Use-Case name** | **Earnings-Per-Share(EPS)** |
| Use-Case ID | 3.4 |
| Priority | High |
| Primary Business Actor | BH |
| Description | BH divides net income of a company over a year by number of shares |
| Trigger | By BH |

**Actors:** BH **Documentation:**Conclusion: When BH is asked to send EPS.  
Post-condition: EPS is displayed  
Implementation issues: Access to number of shares and net earnings of companies is needed.

**3.5: Average Dividend**

A company distributes its profits amongst its shareholders at different times of the years. These profits are not even all the time. When buying a share, the amount a trader can expect to earn from a share in one year is called average dividend. It is obtained by dividing the total amount paid to investors in a fixed time(i.e. one year) by that time.

|  |  |
| --- | --- |
| **Use-Case name** | **Average Dividend** |
| Use-Case ID | 3.5 |
| Priority | High |
| Primary Business Actor | BH |
| Description | BH aggregates dividend paid over time divided by time from historical data |
| Trigger | By BH |

**Actors:** BH **Documentation:**Conclusion: When BH is asked to send Average Dividend.  
Post-condition: Average Dividend is displayed  
Implementation issues: Access to net profit distribution of companies is needed.

**3.6: P/E Ratio**

P/E ratio is the price-to-earnings ratio of a share. It is generally used to measure the viability of a share. With it, a trader can calculate the time it will take to recuperate the buying price of stock from the income it generates. It is obtained by dividing buying price by EPS.

|  |  |
| --- | --- |
| **Use-Case name** | **P/E Ratio** |
| Use-Case ID | 3.6 |
| Priority | High |
| Primary Business Actor | BH |
| Description | BH divides the share buy price by its EPS |
| Trigger | By BH |

**Actors:** BH **Documentation:**Conclusion: When P/E is requested from BH.  
Post-condition: P/E ratio is displayed.  
Implementation issues: Access to both buying price and EPS is required.

# Transaction Handling System

## **Use-case Glossary:**

|  |  |  |  |
| --- | --- | --- | --- |
| Use-Case ID | Name | Description | Participant actors and roles |
| 4.1 | Buy/Sell receipt | Gives user a unique id as receipt to secure his transactions | TRD buys/sells and BH gives receipt |
| 4.2 | Transaction logging | All transactions of companies and users are logged in server for security reasons | BH logs all actions taken on its server in a database |
| 4.3 | Balance verification | Verification and completion of transaction | BH verifies if amount is correct, then BA verifies if the balance is valid and completes transaction |



***Use case narrative:***This subsystem consists of the following use cases-

**4.1: Buy/Sell Receipt**Whenever the TRD makes a buy or sell request, he is given an online receipt by the BH server, having a unique ID so that he has a record of his transaction.

|  |  |
| --- | --- |
| **Use-Case name** | **Buy/Sell Receipt** |
| Use-Case ID | 4.1 |
| Priority | High |
| Primary Business Actor | TRD |
| Primary System Actor | BH |
| Description | TRD buys/sells and BH gives receipt |
| Trigger | By TRD |

**Actors:** TRD, BH **Documentation:**Conclusion: When a buy/sell transaction is requested.  
Post-condition: BH generates the ID and gives it to the TRD.  
Implementation issues: BH must be able to generate a unique ID randomly that does not match with other receipts.

**4.2: Transaction Logging**

All transactions taking place in BH server, whether between BH and bank, or BH and TRD are logged and saved with timestamps for future reference and evidence.

|  |  |
| --- | --- |
| **Use-Case name** | **Transaction Logging** |
| Use-Case ID | 4.2 |
| Priority | High |
| Primary Business Actor | BH |
| Description | BH logs all actions taken on its server in a database |
| Trigger | BH |

**Actors:** BH **Documentation:**Conclusion: Whenever a transaction takes place.  
Post-condition: The log of that transaction taking place is saved with a time-stamp.  
Implementation issues: None of the logs will overlap with time or in content.

**4.3: Balance verification**

Sometimes the TRD puts in more shares to sell than he has or more shares to buy than he has the ability to purchase. The BH cross-checks this information with the bank account of the user and verifies it so that invalid transactions do not take place.

|  |  |
| --- | --- |
| **Use-Case name** | **Balance verification** |
| Use-Case ID | 4.3 |
| Priority | High |
| Primary Business Actor | BH |
| External Server Actor | BA |
| Description | BH verifies if amount is correct, then BA verifies if the balance is valid and completes transaction |
| Trigger | BH |

**Actors:** BH,BA **Documentation:**Conclusion: After a transaction is made and before it is cleared/verified.  
Post-condition: The transaction is accepted or rejected accordingly.  
Implementation issues: There has to be virtual connection between BA and BH.