ABSTRACT

The trend of stock market in Nepal is increasing continuously and the investment in the stock is also rapidly growing. As, the investment transaction need to be recording in a systematic way. So, the recording of the stock investment can be done through the individual portfolio management features. Portfolio management is a personalized management of the different investment done by the investor in different sector of stock market.

Stock Portfolio Management System (SPMS) is the portfolio management web based application mainly focusing to manage an individual's investment in the form of shares and mutual fund as the investor can record their investing company details for future references. It is the system through which different investor can add on their invested units of stock along with their buying price, compare it with the present increasing price of that specific company which helps to analysis profit or loss manually. It is very useful for the people interest in investment as it provide information of upcoming stock, top list on the basis of gain, loss and turnover, market summary. This system is specially targeted to the people who are passionate about investing and willing to invest in share market or stock but are confuse how to record their investment details.

Keywords: individual portfolio, personalized management, portfolio management, investment, web based application

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TABLE OF CONTENTS

Topics **Pages**

LIST OF ABBREVIATIONS

CSS	Cascading Style Sheet
DEMAT	Dematerialization
DFD	Data Flow Diagram
E-R	Entity-Relationship
FPO	Follow-On Public Offering
HTML	Hypertext Markup Language
NEPSE	Nepal Stock Exchange
IPO	Initial Public Offering
JS	JavaScript
MySQL	My Structured Query Language
PHP	Hypertext Preprocessor
SPMS	Stock Portfolio Management System
UI	User Interface

LISTS OF FIGURES

Figures **Pages**

LISTS OF TABLES

Tables **Pages**

CHAPTER 1: INTRODUCTION

1.1 Introduction

Stock Portfolio Management System (SPMS) is one of the web based application in which the investor/shareholder can manage their portfolio by add on their invested transaction details manually in the system, different details of top listed company along with the last transaction price and upcoming company opening for the stock opportunities are render to the investor or capitalist.

The trend of investing in the stock market are increasing at the present time. Majority of the people are fascinate to be part of stock market rather than investing in other fields. Due to the positive circuit of different company and providing the maximum return of their investment as well as due to less risk in investing, numerous investor are being attracted in the field of stock market.

In the early day, the opportunities to invest in the stock market was limited as investor have to invest huge amount of investment and return was also not positive. Likewise, the investor have to visit the bank holding demat account to track and get information of their investment details and bonus. Along with the time this process of accessing self-invest details need to be switch. So, SPMS came into the exist to help the investor to access their invested transaction details and get details of profit generated from the investment at anytime and anywhere or can be said as it is available 24/7.

Here, in this system once the transaction details is placed and store in the database, then the investor can retrieve it in a mean time. And the main advantage to the investor is that they does not have to worry to list transaction details in paper format. SPMS encourage the investor to invest more and motivate to form best portfolio. This system not only help in maintaining portfolio but also consider as a tool for the investor that provides a centralized source of information as it provides quick information of top listed company and upcoming company for the investment opportunity.

1.2 Problem Statement

The trend of stock investment is increasing rapidly in context to Nepal and the new investor are being attract towards the share market day by day. But their arises the problem and prevalent challenges' encountered within the existing stock market. To be in the field of share market, the appropriate and updated information regarding the share like today top listed company, market summary and different analysis tools is required. But due to the lack of resources and inappropriate data, investors have been in trouble in accessing the share information. Similarly, in order to get share investment transaction, shareholder have to visit the bank from where his/her demat account has been open and stand in the queue for a long period which consume time of the investors and investor cannot view their own transaction details as their need of time.

1.3 System Objectives

- To uplift the way of tracking of the investment details for the investor in better way by providing individual portfolio management features.
- To grant the convenient access to different share market related information such as upcoming stock opportunities, top list data and market summary.

1.4 Scope and Limitation

1.4.1 Scope

As the trend of stock market is increasing, the scope of stock portfolio management system is also growing as it can take good market since this software aimed is to be use by investor in their managing stock invested details as well as improve the struggle related to accessing accurate information related to stock market. As this system includes the resources required to be part of stock market such as next IPO allocation, top listed company, market summary.

Limitation

- This system does not include the entire company details like company balance sheet, fundamental analysis.
- Admin as well as users have to enter the details manually as it does not have features of auto generating the details from other platform like Mero Share, Nepse site etc.
- This system is either not made to be apply for stock buy or sell purpose nor to be provide features of listed broker or TMS account.

1.5 Report Organization

Chapter 1: Introduction

This chapter encompass the basic introduction of stock portfolio management system, problem arises in the current stock market and the demand of the system. It also includes the objective of the system. In additional, this chapter also cover the scope and limitation of the system.

Chapter 2: Background Study and Literature Reviews

Under this chapter, the information regarding the background of stock market along with their enhancement are cover. Likewise, the review of existing system similar to stock portfolio management system (SPMS) are carry out to find out flaws which are included here.

Chapter 3: System Analysis and Design

Here, all the system analysis and design component are included in this chapter. Different software requirement i.e. functional and non-functional requirement and various feasibility study are also encompass in the system analysis part. In addition with it, data modeling, and data modeling is also include in the system analysis. And for the system design part, architecture design, database scheme, interface structure diagram of the system are included.

Chapter 4: Implementation and Testing

Different tools used for implementing the system like case tool, programming language, database platforms are contain in this chapter. Similarly, the testing of different module and testing as a software are also included here.

Chapter 5: Conclusion and Future Recommendations

In this chapter, the lesson learnt in the software development process, system outcome and conclusion are noted here. Likewise, the future recommendations and enhancement part from the developer perspective are also list under this chapter.

CHAPTER 2: BACKGROUND STUDY AND LITERATURE REVIEW

2.1 Background Study

The stock market of Nepal has been in existence for a relatively short span. Since the formal trading of securities started after the establishment of Nepal Stock Exchange (NEPSE) in 2050. However, the trading of shares in an unofficially way after Biratnagar Jute Mills and Nepal Bank Limited issued shares to the public in 1995 BS. Due to growing of stock market in the short period and for the systematic of it, meanwhile for the first time since the Companies Act came implementation, government issued bonds in 2021. Yet, a systematic mechanism and body for trading securities had not been established till then. Nevertheless, in 2033 BS - the establishment of Securities Exchange Center was establish and from there the capital market of Nepal was organized. [1]

The major reform in computerized trading in Nepal Stock Market took place after the establishment of central depository system (CDS) in 2067 BS. CDS and Clearing started the work of making the stock market more paperless in the field of technology. The dematerialized the company's share certificates and made it possible to trade share through a demat account. It highly contributed to make the primary market entire paperless. Since, Magh 1, 2075 CDS and Clearing has started trading of demat shares only. Similarly, Nepse started online share trading from Kartik 20, 2075 which has brought the share market into the new era of computerized trading. With the recent introduction of demat, C-ASBA and Mero Share and online trading of shares, the trading of stock either in the primary market or secondary market has become relatively easy. [2]

2.2 Literature Review

A literature review is a comprehensive summary of previous research on topic by authorized scholars and researchers regarding of what has been done before on topic. The purpose of the literature review is to express and enumerate, summarized what ideas have been established and what their positive and negative aspects.

Mero Share, design in the year of 2011 by CDS and Clearing is the software available at the present time for applying primary issue (IPO/FPO) and right share through the computerized form and provides the portfolio facility to the beneficiary to view stock transaction information in individual account. CDS and Clearing Limited, a company established under the company act which is a company promoted by Nepal Stock Exchange in 2010 to provide centralized depository, clearing and settlement services in Nepal develop and design Mero Share service with the main objectives to handle securities in dematerialized form and acts as a central depository for various instruments such as equity, share, bonds etc.

Mero Share which is convenient in nature provides the benefits to view the details of the stock transaction, details of the actual value of the stock based on the market value. Similarly, this system also provides the features to reach out the details of the shares which are under collateral in individual or beneficiary account. In addition, this system is flexible as easily transfer of the shares can be done from EDIS section and can look to the IPO result of the company in which account holder have applied. However, due to huge number of user's and less server installation, the major limitation of this system is the server down and requirement of huge load time. Security is also seems to the major concern in this system. [3]

Online Share Trading, also term as Trading Management System (TMS) is the system design for the secondary market trading by the Nepal Stock Exchange in 2075 BS. It is the system containing the full-features of fund management, order management and trade management so that the investor can buy or sell stock through the electronic way which can be accessed by the internet. The main aim of this system is to promote the systematic trading of stock in the field of secondary market and act as a means of connecting the investor to the system of brokers and Nepse. However, this system does not provide

facilities of portfolio management but provide the benefits to trade share through the internet from anywhere in the world.

This system help to practice the hassle free trading experiences without any outer interferences. Likewise, this system gives more control and flexibility over your investing decisions. However, this system user experiences is quite compatible for the new users or investors. [4]

Merolagani.com, a web based system developed and run by Asterisk Technology Pvt. Ltd provides live stock data, news, annual and quarterly reports and analysis and provides portfolio management tools. It also presents a portfolio trackers including the gains and losses details. The main aspects of this system is that it provides the set up alerts for every price changes in the stocks in user watch list and get SMS alert and email notifications. In additional with this, single account can manage multiple portfolio. [5]

Nepse alpha, is also another web based stock market portal which is providing free live technical analysis chart, fully automated stock analysis tools including multiple timeframe charting of listed companies, floor sheets analysis, triple screen and pocket portfolio management features. The main aspects of this system is it provide detailed information about all the aspect of stock market like increment or decrement in macd and rsi, QOC and YOY growth, margin net profit etc. and all this services are provided without any charge. [6]

Reviewing different software existing in the stock market, it was found that mostly all the software was design with the purpose to provide portfolio tracking features along with different resources related to stock information. Likewise, every existing system also provide fundamental and technical analysis tool. However, the stock portfolio management system (SPMS) is the basic software mainly for recording the investment transaction manually and does not provide automatically fetching of Nepse data from its API. It also does not include fundamental and technical tool for analysis purpose as provided by other existing software. But includes the basic stock related information like top listed, upcoming stock and market summary which will be manually add on our system.

CHAPTER 3: SYSTEM ANALYSIS AND DESIGN

3.1 System Analysis

This project is designed for developing Stock Portfolio Management System (SPMS) targeting the investor. So, in the process of system designing, different steps were taken as consideration. Among the different step, the major steps was of system analysis. Different functional and non-functional requirement gathering and feasibility study was carried out as a part of system analysis. Similarly, process modeling, data modeling are also drawn for analyzing and develop it according to the requirement.

3.1.1 Requirement Analysis

Requirement analysis describes what the system should perform and what the expectation of the users to the new system. It includes the identification of end users' need and preparation of a corresponding document term as software requirement specification (SRS). Before starting the development of the new system, the following requirement are taken into consideration.

i. Functional Requirement

Table 3.1: Functional Requirement

S.N.	Req Id	Requirements	Descriptions
1	R-1	Account creation for users	Users should be able to create their accounts for accessing this system
2	R-2	Login Section	Admin and Users should be able to log in to this system after meeting the credential
3	R-3	Manage Portfolio section	The users should be able to manage portfolio (Add new details in portfolio, modify existing details and delete the portfolio data).

4	R-4	Upcoming Issue section	Upcoming issue section should contains updates information regarding the company issuing new stock investment opportunities along with the issuing units
5	R-5	Top Listed section	Top Trader section should contain details of top company on the basis of gain, loss and turnover of company
6	R-6	Market summary section	Market summary section should contain summaries stock transaction details of the entire day
7	R-7	View users	Admin should be able to view the users details except the password which is provided by the user while account creation process
8	R-8	Manage upcoming stock, top listed and market summary details	Admin should be able to manage upcoming stock, top listed and market summary section (Add new data, modify the existing data and delete the data)
9	R-9	View upcoming stock, top listed and market summary	Users should be able to view all the details of upcoming stock, top listed and market summary from their respective portal
10	R-10	Change Password	Admin and Users should be able to change the existing password with the new one

ii. Non-Functional Requirement

- Security:

The stock portfolio management system uses md5 techniques for password encryption and must use at least seven character password as a parameter for security

- User friendly:

The system is designed with the interface which will be friendly and easy to operate and provide maximum optimizations for smoother performance. Users with basic

knowledge of internet can use this system. The system uses a simplified interface and simple content language to improve the user friendliness.

- Easy Access:

As the system can be accessed through the internet, so anyone with the internet facility can easily use this system.

- Maintainability:

From the developer perception, the system is easy to maintain as code are written in clean and readable manner for future maintenance.

3.1.2 Feasibility Analysis

For the feasibility analysis, the study of technical, economical and time feasibility were conducted.

i. Technical Feasibility

This system is technically feasible as the technical resources available to implement ideas or propose system to real software is easily accessible. For this system development, the hardware and software was within the current technology as this project was designed with the open-source and free tool and the hardware requires for coding and deployment was also present and have not issue with hardware infrastructure.

ii. Operational Feasibility

This system is feasible toward the operation as it is easily accessible to operate due to the available of user friendly user interface and the basic knowledge of web and computer is sufficient to access SPMS. In additional, this system perform all the operations the system should do and includes all the requirement need.

iii. Economic Feasibility

From the developer's perspective, we use open source development tools and did not find any economic difficulties in this project. Similarly, the cost of development is within the determine budgets. So, the system can be term as economically feasible and cost effective in nature.

iv. Time Feasibility

On the basis on the prior experience, this project was completed within the 4.5month time phase. This below table show the time needed for software development project and concluded as software have no issue and is timely feasibility in essence.

Table 3.2: Gantt Chart

System Development TimeLine										
Tasks	15th April	30th April	15th May	30th May	15th June	30th June	15th July	30th July	15th Aug	30th Aug
Planning										
Research and analysis										
Literature Reviewing										
Project Proposal										
UI Designing										
Backend Coding										
Testing										
Document ation										

3.1.3 Data Modeling (ER- Diagram)

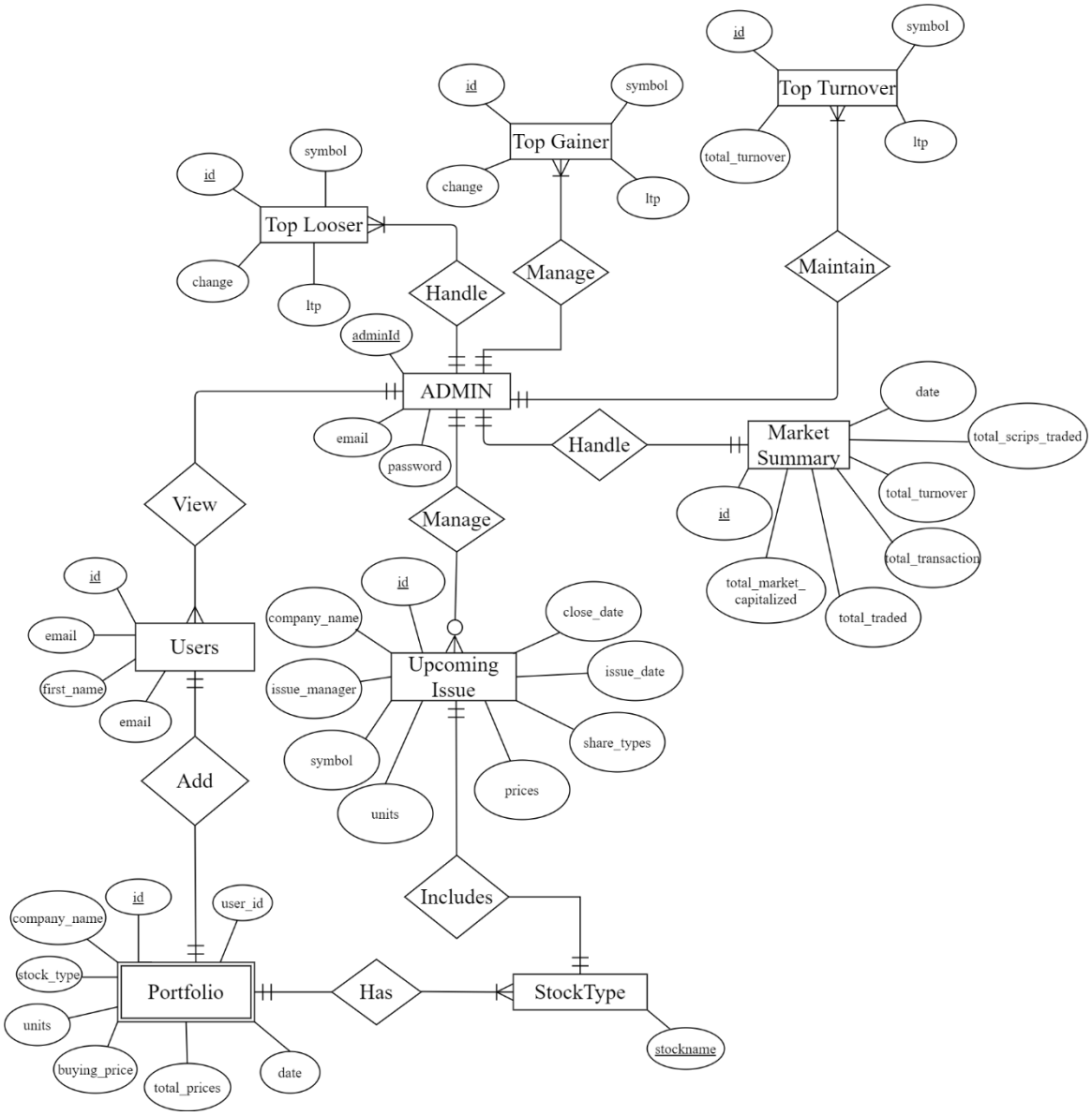

Figure 3.1: ER- Diagram for Stock Portfolio Management System

3.1.4 Process Modeling (DFD Diagram)

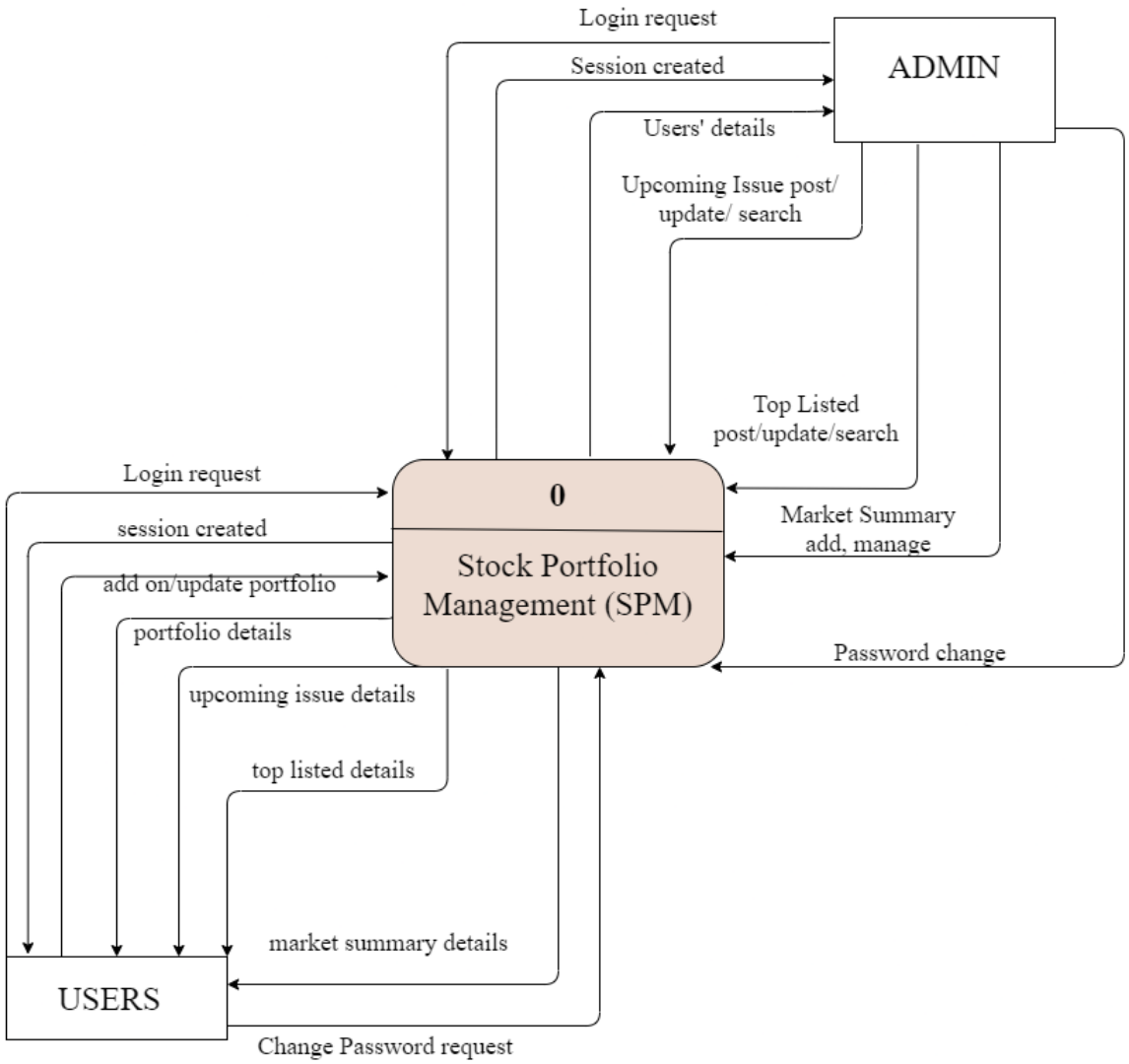

Figure 3.2: Level 0 DFD for Stock Portfolio Management System

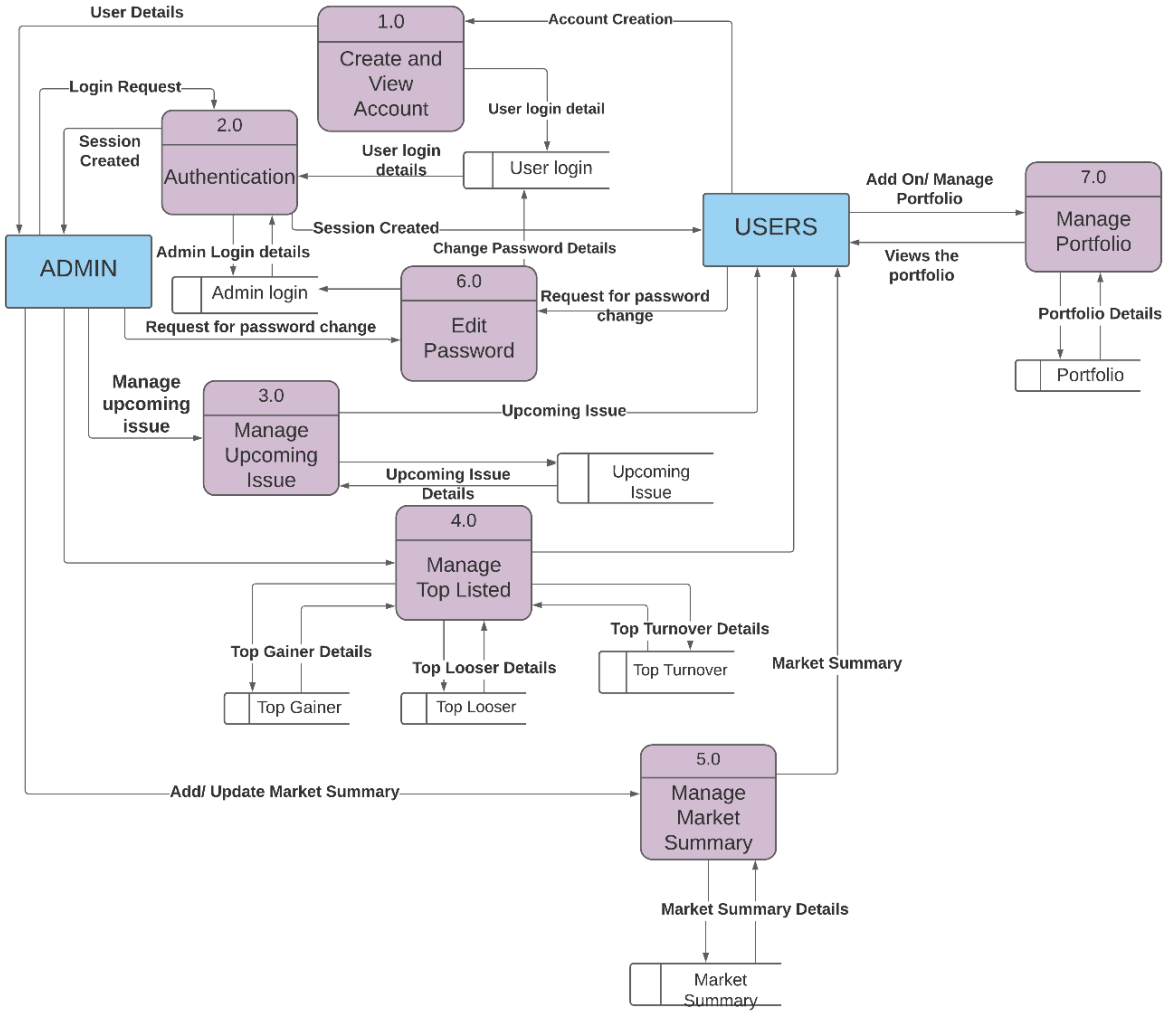

Figure 3.3: Level 1 DFD of Stock Portfolio Management System

Table 3.3: Process Table

Process Id	Process Name	Process Description	Requirement Id
1.0	Create and View Account	Create and view the users account	R-1, R-7
2.0	Authentication	Authentication check of user and admin for dashboard access	R-2
3.0	Manage Upcoming Issue	Manage of the upcoming issue data (add, update, delete and view)	R-4, R-8, R-9
4.0	Manage Top Listed	Manage of the top looser i.e. (add, update, delete and view)	R-5, R-8, R-9
5.0	Manage Market Summary	Create, Update and View the market summary	R-6, R-8, R-9
6.0	Manage Portfolio	Post, Update along with view and update the portfolio	R-3
7.0	Edit Password	Update the existing password with new one	R-10

3.2 System Design

As the detailed study of available system similar to our concept was done and after consulting with the stockholder, we came in the result to design the system on the basis of the demand and requirement from those who are facing difficulties in managing their collection of stock that was invested with the hope of making profit and want to have systematic records of the stock portfolio.

By considering the demand and requirements of stockholder, we decided to develop stock portfolio management system where admin will be updating the share related information on the daily basis and the users/ stockholder will be handling their stock portfolio and see the share information.

3.2.1 Architecture Design

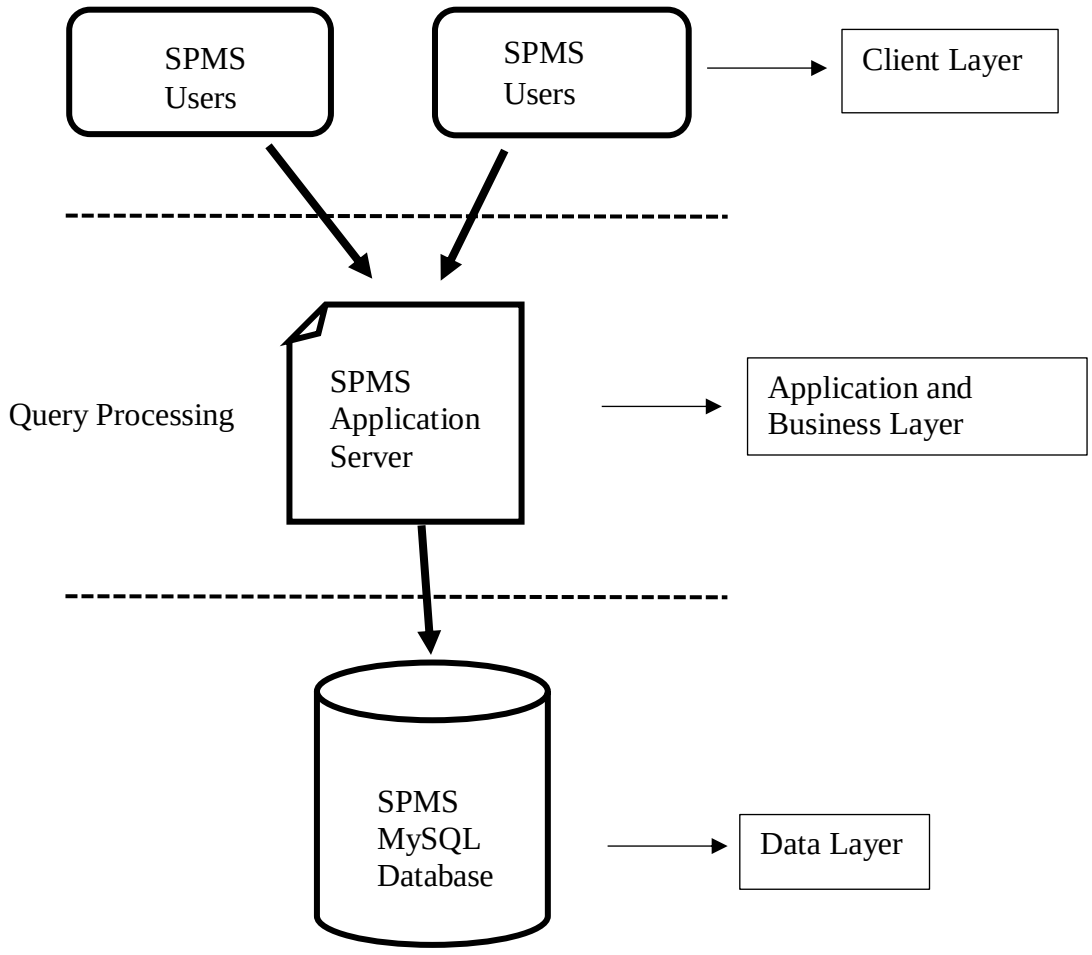

Figure 3.4: Architecture Design of Stock Portfolio Management System

The figure shows the architecture design of the stock portfolio management system which includes the 3 tier as:

Client layer: In this layer, SPMS users use the interface of the SPMS software and send the query through the application layer.

Application layer: All the query of the users are process here for the SPMS software and acts as a layer for communicating with database. Here, all the form validation, query of the users are take place and after all the processing is done, it send to the data layer.

Data layer: From here, the user request data are fetch and provided.

3.2.2 Database Schema Design

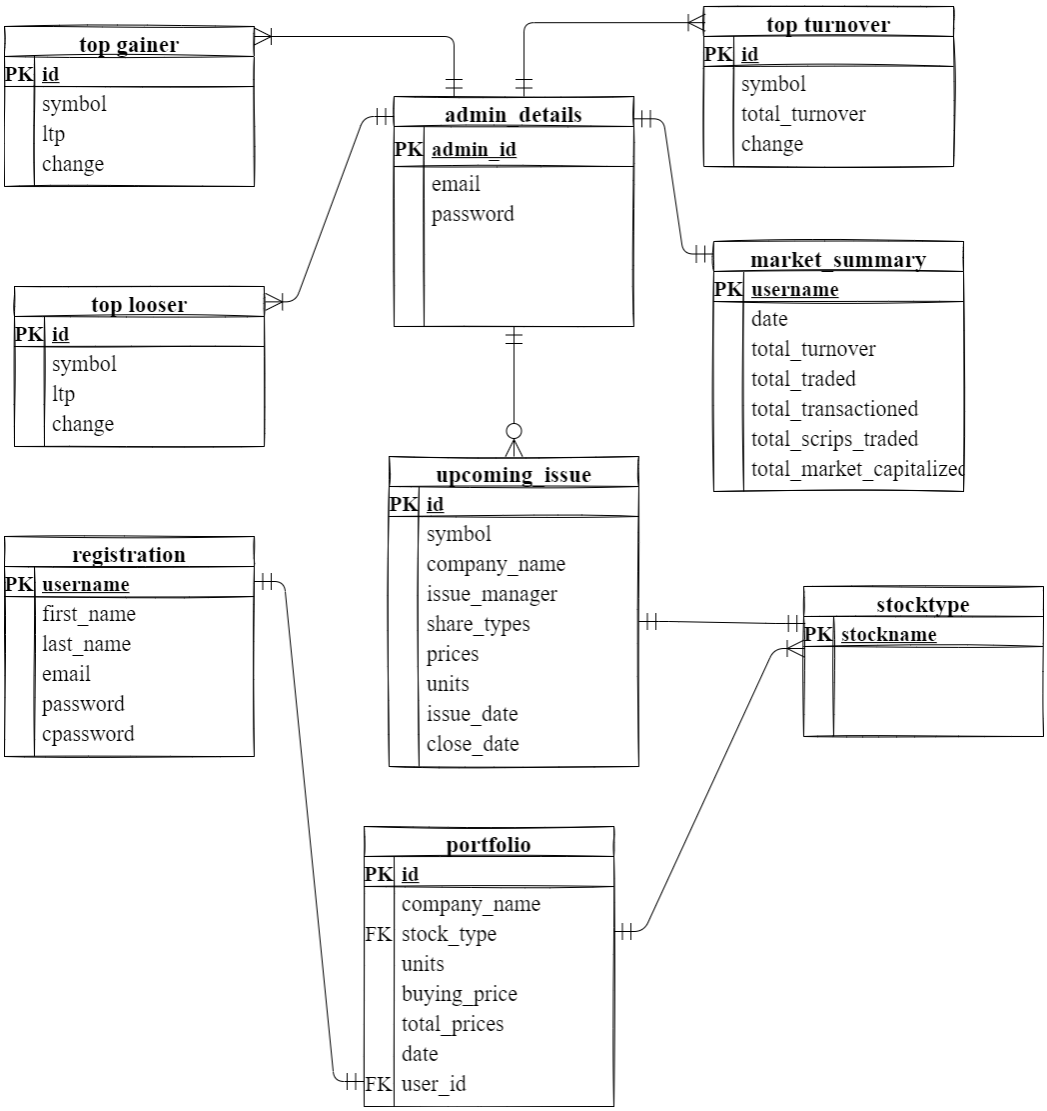

Figure 3.5: Database Schema Design of Stock Portfolio Management System

Table 3.4: Data Dictionary

Top_Gainer				
Field Name	**Data Type**	**Allow Nulls**	**Primary Key**	**Foreign Key**
id	int	No	Yes	
symbol	varchar(100)	No		
ltp	int	No		
change	int	No		

Top_Looser				
Field Name	**Data Type**	**Allow Nulls**	**Primary Key**	**Foreign Key**
id	int	No	Yes	
symbol	varchar(100)	No		
lastTransactionPrice	int	No		
change	int	No		

Top_Turnover				
Field Name	**Data Type**	**Allow Nulls**	**Primary Key**	**Foreign Key**
id	int	No	Yes	
symbol	varchar(100)	No		
total_turnover	int	No		
ltp	int	No		

Admin_details				
Field Name	**Data Type**	**Allow Nulls**	**Primary Key**	**Foreign Key**
id	int	No	Yes	
email	Varchar(50)	No		
password	Varchar(50)	No		

Upcoming_Issue				
Field Name	**Data Type**	**Allow Nulls**	**Primary Key**	**Foreign Key**
id	int	No	Yes	
symbol	varchar(50)	No		
company_name	varchar(150)	No		
issue_manager	varchar(150)	No		
share_types	varchar(150)	No		
price	int	No		
units	int	No		
issue_date	date	No		
close_date	date	No		

Market_Summary				
Field Name	**Data Type**	**Allow Nulls**	**Primary Key**	**Foreign Key**
id	Int	No	Yes	
date	Date	No		
total_turnover	bigint(50)	No		
total_traded	bigint(50)	No		
total_transaction	bigint(50)	No		
total_scrips_traded	bigint(50)	No		
total_market_capitalized	bigint(50)	No		

Registration				
Field Name	**Data Type**	**Allow Nulls**	**Primary Key**	**Foreign Key**
id	int	No	Yes	
username	varchar(100)	No		
first_name	varchar(100)	No		
last_name	varchar(100)	No		
email	varchar(50)	No		
password	varchar(50)	No		
cpassword	varchar(50)	No		

Portfolio				
Field Name	**Data Type**	**Allow Nulls**	**Primary Key**	**Foreign Key**
id	int	No	Yes	
company_name	text	No		
stock_type	text	No		
units	int	No		
buying_price	int	No		
total_price	int	No		
date	date	No		
user_id	text	No		

StockType				
Field Name	**Data Type**	**Allow Nulls**	**Primary Key**	**Foreign Key**
stockname	varchar(30)	No	Yes	

3.2.3 Interface Structure Design

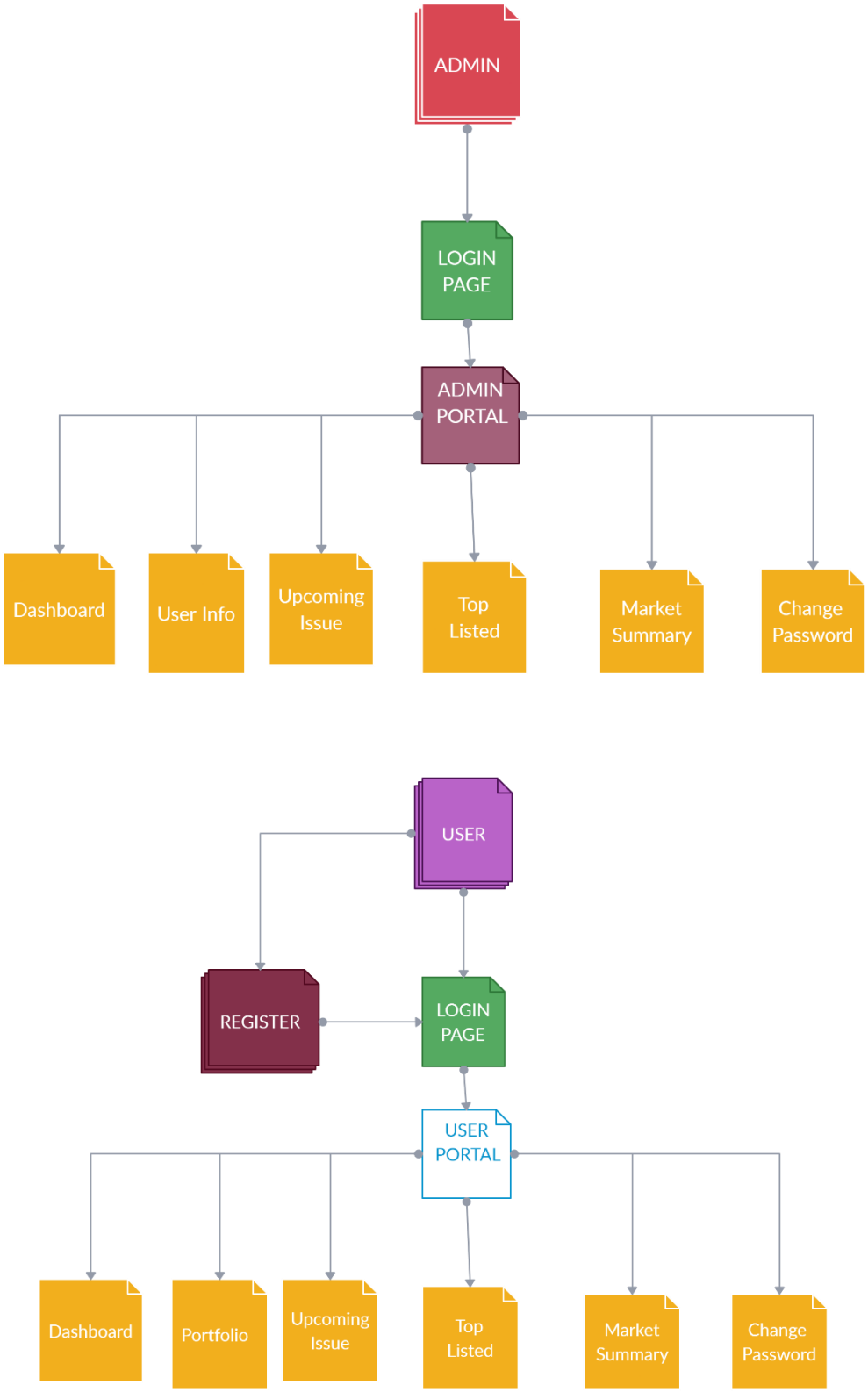

Figure 3.6: Interface Structure Design for Stock Portfolio Management System

3.2.4 Physical DFD

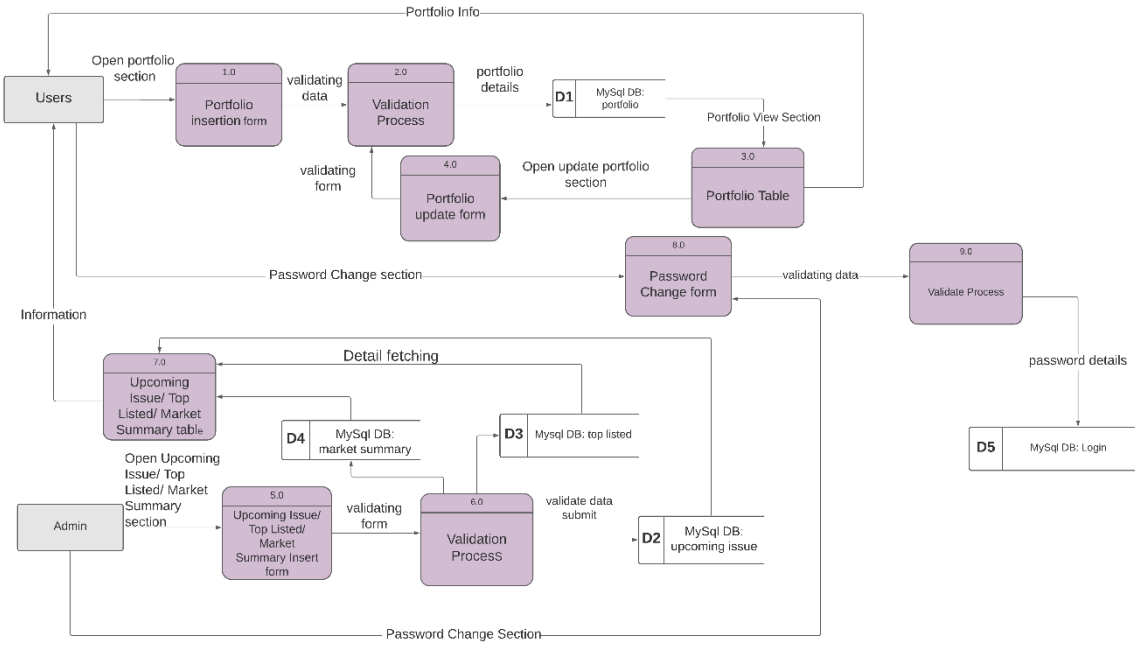

Figure 3.7: Physical DFD of Stock Portfolio Management System

Chapter 4: System Implementation and Testing

Among the different software development life cycle (SDLC), one of the major step is system implementation and testing. During this phase, coding is done according the design and testing of the code is done for disclosing of the bug and debugging it from codes. After code being bug free and as per the user requirements the system will be installed.

In this phase the steps like coding, testing, installation, training and documentation are followed:

4.1 Implementation

For the implementation part to convert the design to the real world software through coding, the developers team has used different open-source platforms of front-end and backend along with the free database tools.

4.1.1 Tool Used

Case tool

As a part of case tool, different software like draw.io for data modeling and database schema, ludichart for process modeling has been use for design purpose.

Front End Language

HTML: HTML is use for the designing the interface and structure of the system.

CSS: CSS is used for styling out the interface through the css properties.

JavaScript: JavaScript is used for adding the behavior in our system and for the client side form validation.

Backend Language

PHP: For the backend part, open source programming language i.e. PHP is use to create dynamic web application and to interact with database.

Database platform

MySQL: As a database platform, My Structured Query Language is use as an open source SQL database management system to process and retrieve queries from the database.

4.1.2 Implementation Details of Module

A module is a software component or part of a program that contains one or more routines. One or more independently developed modules make up a program. The application name as stock portfolio management system is divided into different modules:

Registration Module: The registration module is responsible for creating the new users for this system. In this module, new users have to enter the username, email, password and other field in order to access this system through account creation.

Login Module: This module is responsible for the admin and user to login in our system for accessing their respective portal. Here, in this admin login, the admin have to enter the admin email and password which has been default save and users have to enter the username and password which was set during account registration process.

Dashboard Module: This module is responsible for accessing the dashboard section. Both the users and admin can access their own dashboard through this module. Admin dashboard consist of total number of users and upcoming issues whereas user dashboard consists of the total number of transaction, total sum of investment and number of upcoming issue that are fetch from database.

Portfolio Module: This module is responsible to enable user to access portfolio section. From here, users can manage his/her individual portfolio and view all the manually added investment transactions.

Upcoming Issue Module: This module is responsible for managing and viewing the upcoming issue section. Admin can add, edit and delete the upcoming issue and users can view the upcoming issue details from this module.

Top Listed Module: Same as upcoming issue module, this module is responsible for managing and viewing the top listed module i.e. top gainer, top looser and top turnover details. Here, admin can add, update and delete all the top listed details whereas users can only outlook to all the top listed details.

Market Summary Module: This module is responsible for managing the market summary part. In this module, admin can add a single market summary of an entire day and users can view it.

About Me Module: This module is responsible for viewing information use for the account creation.

Change Password Module: This module is responsible for changing of the password of both the admin and user from their respective panel.

4.2 Testing

The developer team perfectly tested this system functionality using dummy data. This system is entirely tested so that some users can have trial use of this web application. The system has been tested thoroughly using the following testing technique:

4.2.1 Test Case Requirement:

For the verification, validation and debugging of the system, the following test case has been designed:

Table 4.1: Test Case Requirement

S.N.	Description	Requirements
1.	Right of Admin	View all the users details
		Adding on and managing upcoming issue
		Create top gainer and manage it
		Inserting top looser and maintain it
		Set top turnover details and handle it
		Add up and manage the market summary
2.	Right of Users	Register for the accessing the SPMS system
		View the upcoming issue details
		Check out the top gainer details
		View the top looser details
		Explore the top turnover details

		Observe the market summary
		Add on the stock transaction in portfolio and manage it
3.	Duplicate of username and email	Users must use unique username and email rather than existing one from our system while creating account
4.	Change Password	Admin and User must be able to change password of their ones

4.2.2 Test Cases for Unit Testing:

During the testing process, individual units of source codes, sets of one or more program modules are tested to determine whether they can perform as per expectation. Each separate activities like registration, login in, portfolio etc. have been tested individually and all the tested activities pass with the successful result.

Table 4.2: Test Case for Admin Login

S. NO	Test Case Id	Test Description	Input Test Data	Expected Result	Actual Result	Pass / Fail
1	TC-01.1	Open browser and enter url	localhost/ StockPortfolio/ admin/login.php	Login Page should be displayed with the input field of email and password	Login page shown with the email and password of admin for accessing the admin panel	Pass
2	TC-01.2	Enter valid data in username and password filed	Email: aavashh@admin.com Password: ********	Redirecting to the admin panel	Admin Panel Displayed	Pass

3	TC-01.3	Enter data in email and password as empty field	Email: Password:	Error message must be shown as email and password field is empty	Error message displayed as email field is empty and password field is empty	Pass
4	TC-01.4	Enter valid data in email and leave password as empty field	Email: aavashh@admin.com Password:	Error message must be shown as password field is empty	Error message displayed as password field is empty	Pass
5	TC-01.5	Enter valid data in email as blank and password as some input value	Email: Password: **********	Error message must be shown as email field is empty	Error message displayed as email field is empty	Pass
6	TC-01.6	Enter invalid email and password	Email: nanana@aa.com Password: heyyy	Error stating email or the password is incorrect as a displayed warn	Email/ Password is incorrected is displayed	Pass

Table 4.3: Test Case for User's Login

S. No	Test Case Id	Test Description	Input test data	Expected Result	Actual Result	Pass/ Fail
1	TC-02.1	Open browser and enter url	localhost/Stock Portfolio/ project/login.php	Login Page should be displayed with the input field of username, password and captcha field	Login page shown with the email, password, captcha for users for accessing the users panel	Pass
2	TC-02.2	Enter valid data in all the input field	Username: aavash Password: ********* Captcha field is solved	Check the input with the data add on during registration from database and captcha to the google server if match redirect it to the user's panel	If validate with the actual data, shown the user panel	Pass
3	TC-02.3	Enter valid data in username and password as empty field	Username: aavash Password: Captcha field is unsolved	Error message must be shown as password must be filled out and please solve the captcha	Error message displayed as password must be filled out for password and please solved the captcha for captcha field	Pass

4	TC-02.4	Enter valid data in username , captcha is solved and leave password as empty field	Username: Password: ********* Captcha field is solved	Error message must be shown as username must be filled out	Error message displayed as username must be filled out	Pass
5	TC-02.5	Enter empty data in all the listed field	Email: Password: Captcha field is unsolved	Error message must be shown as username must be filled out, password must be filled out and please field the captcha	Error message displayed as username must be filled out, password must be filled out and please field the captcha	Pass
6	TC-02.6	Enter invalid username and password	Username: sumiii Password: 12kskk Captcha field is solved	Error stating invalid username! Register if you don't have account	Displayed invalid username! Register if you don't have account	Pass
7	TC - 02.7	Enter valid username and invalid password	Username: aavash Password: ***** Captcha field is solved	Error stating username/password is incorrect must be show	Displayed username/ password is incorrect	Pass
8	TC-02.8	Enter valid username and password	Username: aavash Password: ********	Must show error as please field the captcha inorder to	Stating error as please field the captcha	Pass

		but captcha is unsolved	Captcha field is unsolved	login to user's panel		

Table 4.4: Test Case for Portfolio

S. NO	Test Case Id	Test Description	Input Test Data	Expected Result	Actual Result	Pass / Fail
1	TC-03.1	Enter valid data in company name, stock type, units, price ,transaction date	Company Name: Upper Hydro Stock Type: Secondary Units: 100 Price: 850 Transaction Date: 2021-07-15	Company must add to portfolio section with alert message	Hurray! Message was display with the adding of transaction in portfolio section	Pass
2	TC-03.2	Enter numerical data in company name, units, price	Company Name: 455483 Stock Type: Secondary Units: 30 Price: 550 Transaction Date: 2021-07-15	Error message must be company name must be alphabet character	Error message displayed as company name must be alphabet character	Pass
3	TC-03.3	Enter valid data in company name, stock type, units, price and leave transaction date as empty	Company Name: NABIL BANK Stock Type: Secondary Units: 100 Price: 1350 Transaction Date:	Error message must be date of transaction must be filled	Error message displayed as transaction date must be filled	Pass
4	TC-03.4	Enter empty data in company	Company Name: Stock Type: Units:	Error message must be	Error message displayed as company name,	Pass

		name, stock type, units, price and transaction date	Price: Transaction Date:	shown as company name, stock type, units, price and transaction date field is empty	stock type, units, price and transaction date field is empty	
5	TC-03.5	Enter valid data in company name, stock type, units, transaction date and alphabet character in price	Company Name: Upper Hydro Stock Type: Secondary Units: 100 Price: aavashh Transaction Date: 2021-08-12	Error stating price must be numeric	Error message is shown as price must be numeric	Pass

4.2.3 Test Cases for System Testing:

The system testing have been performed by testing the entire software in the developer hardware. From this system, we can conclude the entire stock portfolio management system runs smoothly and show the working functionality as per expected.

Black box testing as a software testing method has been used for this system testing

Table 4.5: Black Box System Testing

S.N.	Description	Requirements	Result	Test Status
1.	Right of Admin	View users details	Admin can view users' details use by the users for creating account	Passed
		Managing and Adding upcoming issue of stock	Admin can manage and add upcoming issue of stock	Passed

		Inserting and Administering top gainer	Admin can insert and administer top gainer	Passed
		Creating and Handling top looser	Admin can create and handle top looser details	Passed
		Setting up and Managing top turnover	Admin can set up and manage top turnover details	Passed
		Adjoining and Maintaining market summary	Admin can adjoin and manage market summary	Passed
2.	Right of Users	Register for new account	Users can register for new account	Passed
		Add up new stock transaction	Users can add up the new stock transaction in the portfolio	Passed
		View upcoming issue	Users can view the upcoming issue of new stock opportunity	Passed
		Check out top gainer	Users can check out the top traders details	Passed
		Observe top looser	Users can observe and search top looser details	Passed
		View top turnover	Users can view top turnover details	Passed
		Explore market summary	Users can explore the market summary of the stock market	Passed
3.	Duplication of username and email	Users should provide unique username and email address while creating account	Once used username email address for account creation cannot further be used for	Passed

			new account creation	
4.	Change Password	Admin and Users should be able to change password	Admin and Users can only change password if they are login into respective panel	Passed

CHAPTER 5: CONCLUSION

5.1 Lesson Learnt/Outcome:

From the developer view, the major lesson learnt was the process in developing the real world software. Similarly, the need of clean and well-structure code for debugging the error is also well understood. Likewise, the importance of variable declaration and the maintaining the database in effective manner is also learnt through this software.

Moving toward the outcome, this system was develop with the objectives to fulfill the requirement of the stock investor to record their transaction and the outcomes came as per the expectation. The outcome of this project is the real world software named as stock portfolio management where the users is able to post their stock investment details, view their transaction details in a pictorial representation and can be up to date on the stock related details like upcoming issue, top listed and upcoming issue and admin is able to manage the content of the stock related information as the stock market goes.

5.2 Conclusion

Stock Portfolio Management System (SPMS) is a web-based application in which shareholder can add on their stock investment details as well as different share related materials are provided to the application users. This system is develop targeting the shareholder who are facing difficulties in managing their stock investment details but want to handle the stock transaction in a systematic manner with the hope to make profit.
This system is cost effective so it can be used by most of the shareholder from globe at any desire time. The real data of upcoming issue, top traders and market summary helps the shareholder to make effective decision for carrying out the activities of stock market.

Going through the development process of this project, we have been familiarized with the practical knowledge of how web applications are design and developed. By the time of accomplishment of this project, we get to realize the true essence of team work form completion of the project and we have been built up with the confidence regarding system analysis, designing, implementation, debugging, testing and maintenance.

5.3 Future Enhancement

This Stock Portfolio Management System can be further enhance to upgrade its features and functionality. Replacement of the manually add on the stock transaction by users can be done through the automatic import of the csv file from Mero share. Despite posting and managing of every transaction of stock market in our system is not preferable. So, implements of API of Nepse can be done for updating the stock information on the timely basis. AI technology can be implement in our system to forecast the company technical status. Likewise, different stock analysis tools can be provide in this system for the user's easiness in stock trading and analysis.

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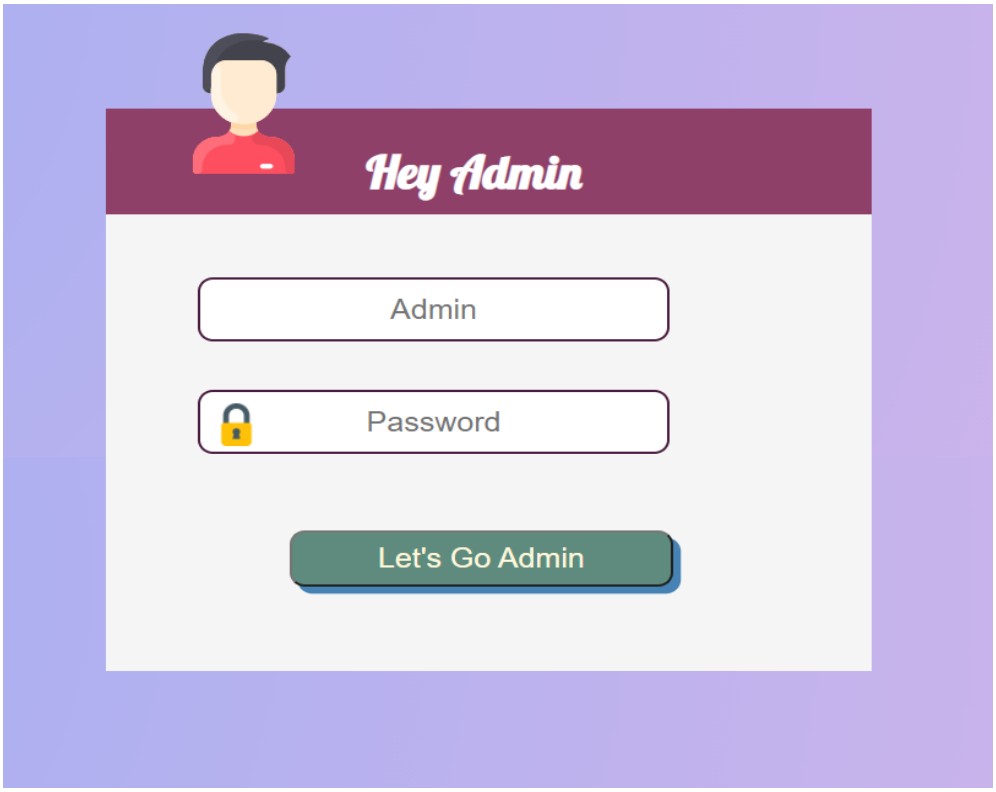
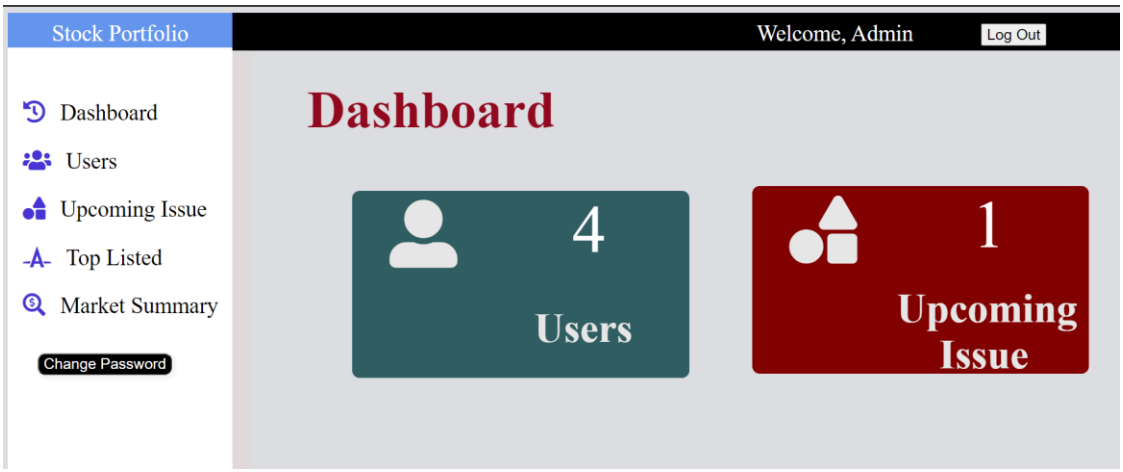
APPENDICES

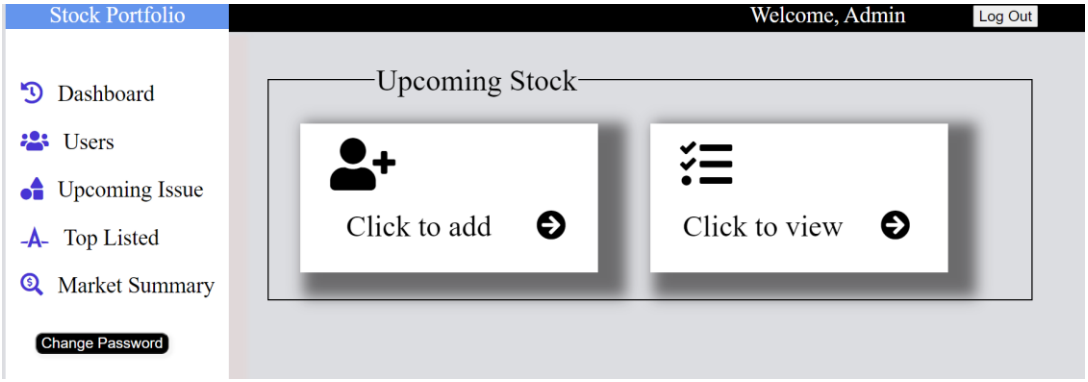
Login interface for admin

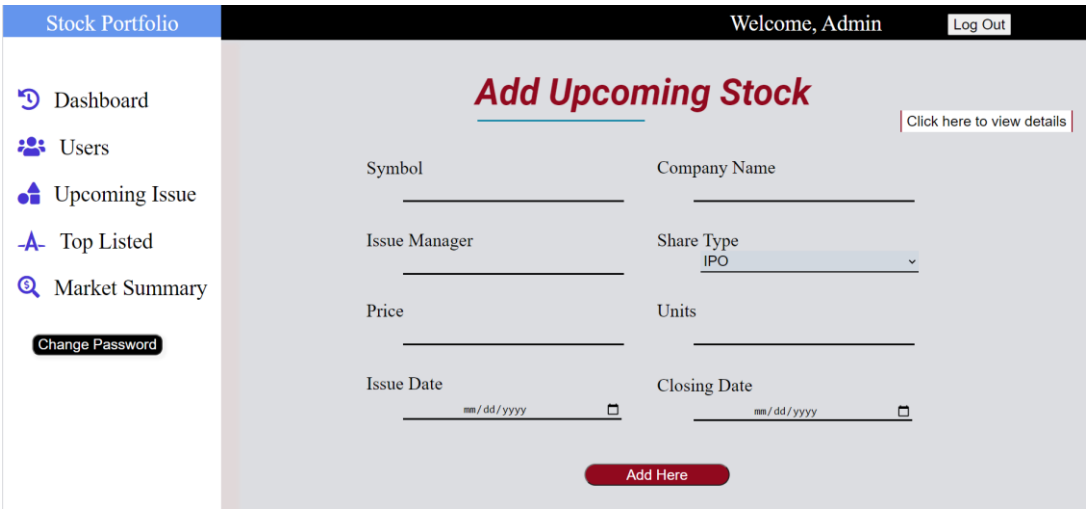


Dashboard interface of admin

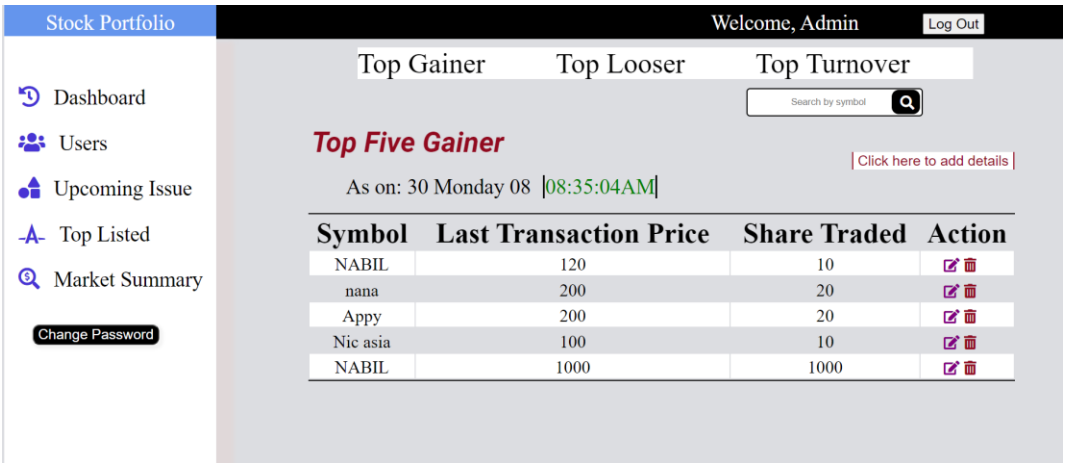


Upcoming Issue interface

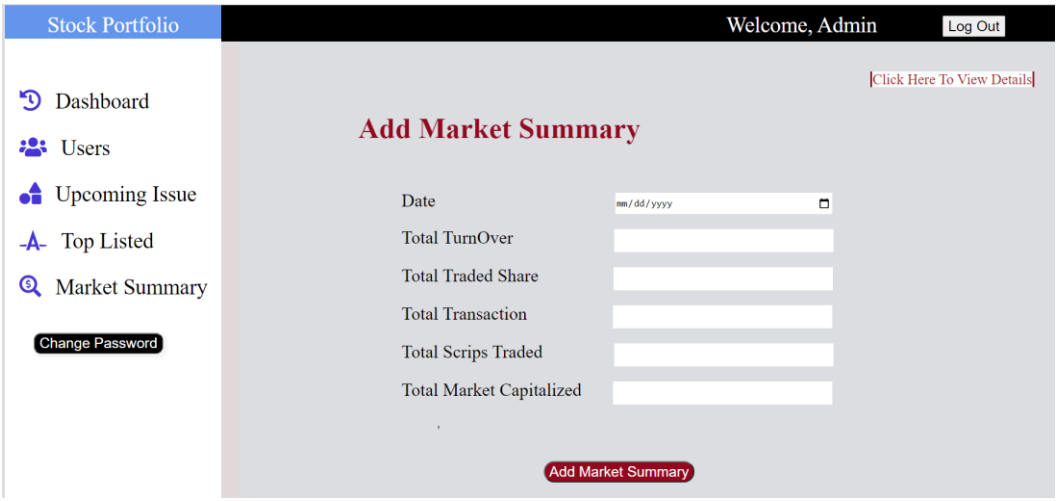




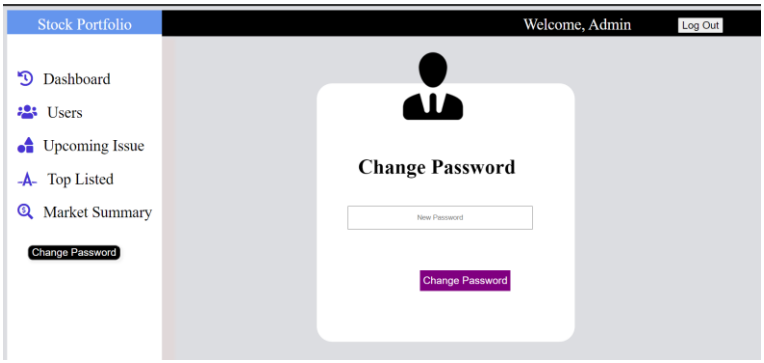
Top Listed Interface



Market Summary Interface

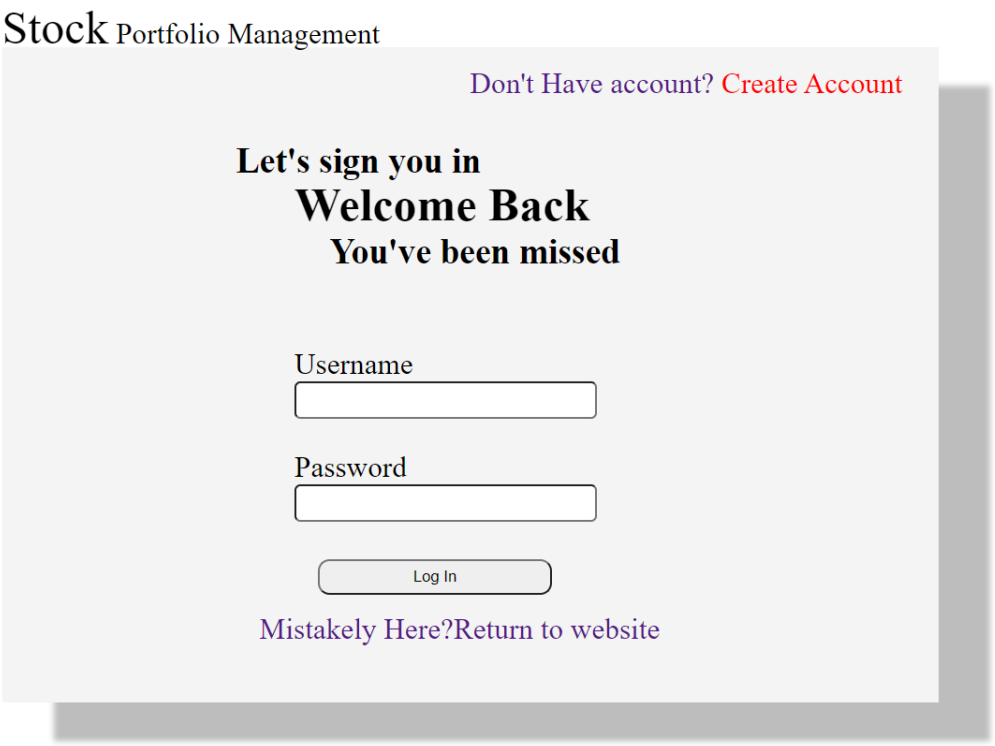


Change Password

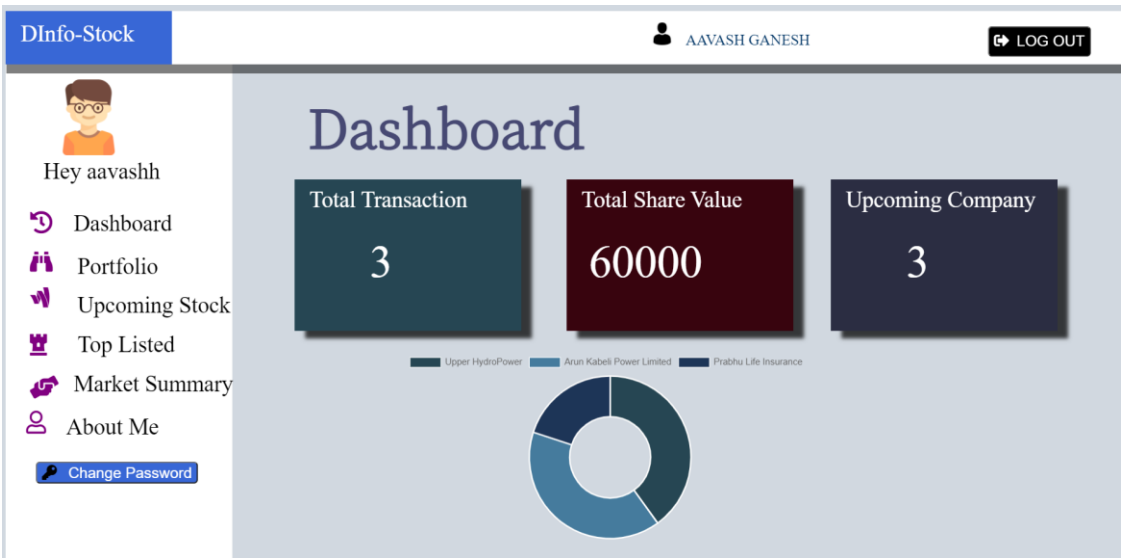


Registration- interface for user

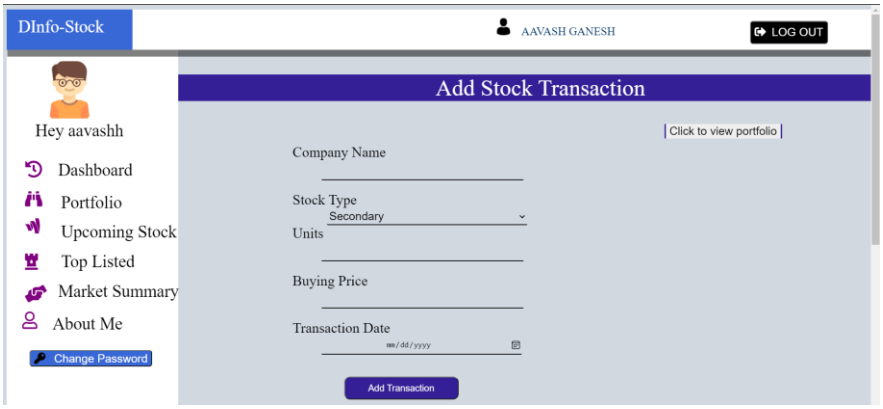
Login-interface for user

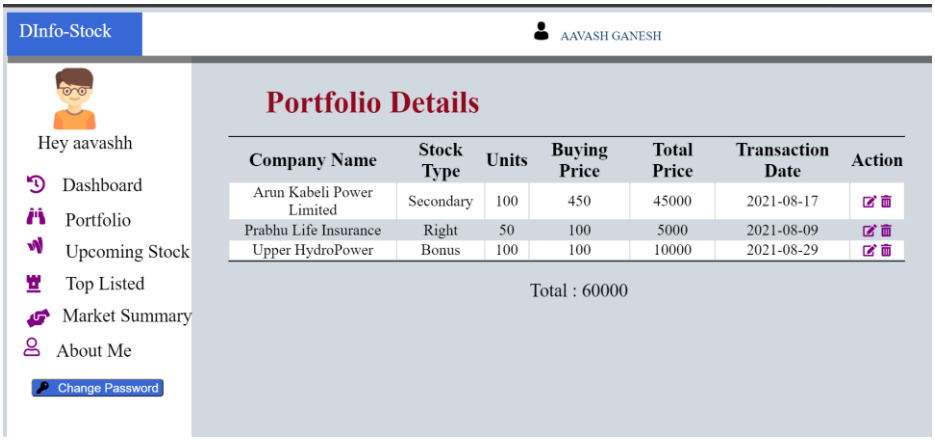


Dashboard- interface for user



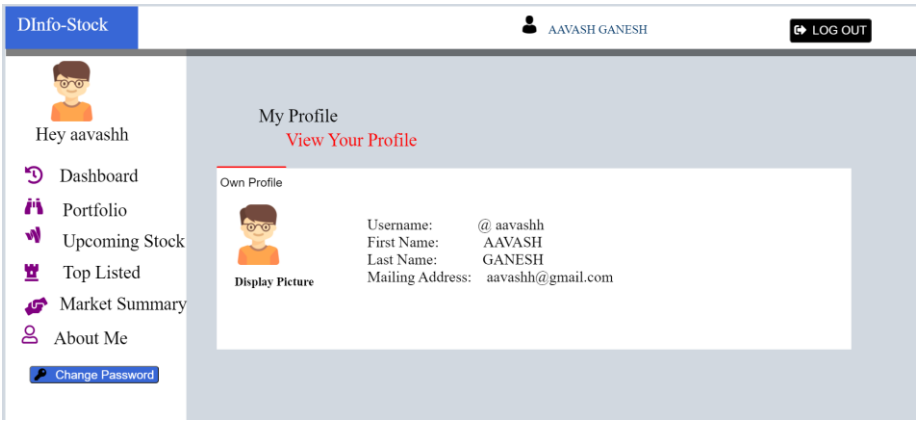
Portfolio- interface of user





Market Summary- Interface

About Me- Interface



Change Password