

# Design Andimplementation of the Stock Data Analysis System based on Django

Li Zhang<sup>1, \*</sup>, Taizhi Lv<sup>2</sup>

<sup>1</sup>School of Information Technology, Jiangsu Maritime Institute, Nanjing Jiangsu 211170, China

<sup>2</sup>R&D Department, Nanjing Huihai Transportation Technology Company Limited, Nanjing, China

\*453712562@qq.com

## Abstract

In order to facilitate stock market browsing and data analysis for shareholders, a stock data analysis system is designed and implemented. This system can obtain daily stock data information and enable shareholders to conduct preliminary screening according to the trend of visual data. It can also browse shareholders' consultation for exchange comments, and users can add their own stocks to observe and wait for the best trading opportunity. The system is divided into two roles, administrator user and general user. The system includes four modules: the information module of individual accounts of shareholders, the real-time stock market module, the management module of self selected shares and the advisory forum module. The development of this system adopts Python technology, B/S framework, and Django framework. Because the stock market contains massive stock data, it uses Doris to store stock market data to improve efficient and highly available queries. For the visualization part of stock history data, ECharts is used for chart display.

## Keywords

Data Analysis; Crawler Technology; Python; Doris Data Warehouse; Django Framework.

## 1. Introduction

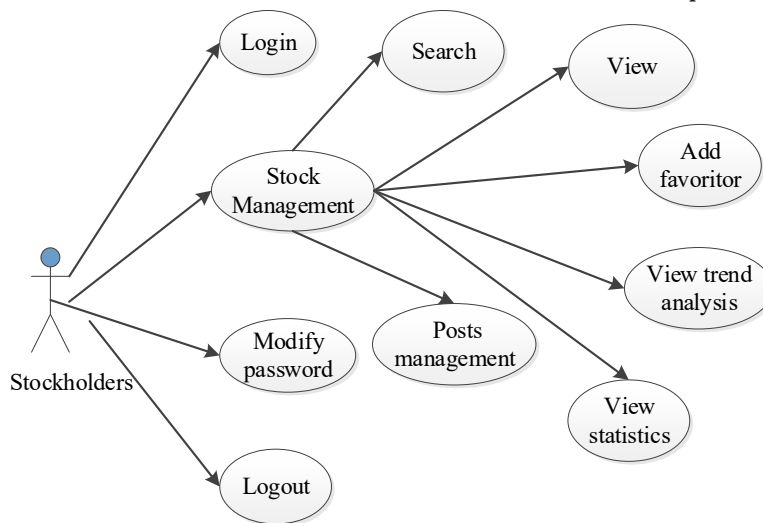
At present, there are a lot of stock trading software in China, such as Oriental Wealth, Great Wisdom, Flush, etc., but these softwares provide similar functions, such as looking at the K line chart, some technical indicators, stock forecasting and screening functions are very close, and individuals can not conduct independent index screening. After years of securities trading, more and more retail investors have explored their own stock speculation experience, but it is difficult to choose stocks according to their own personalized indicators. With the rapid development of the Internet, offline securities trading is no longer satisfied with the demand and gradually becomes online. Various stock analysis systems are also constantly improving and have been widely promoted and applied [1-2]. Zhong developed a stock trading management system based on Java EE architecture and B/S architecture, which greatly improved the efficiency of stock suggestion management [3]. Based on the SOA architecture, Li has developed and implemented a stock analysis system that integrates professional analysis functions and social services for stock trading [4].

This system has designed a Python based stock screening management system, which uses the crawler technology to obtain daily stock data information and enable shareholders to conduct preliminary simple screening according to the trend of visual data. It can also browse the current market for shareholder consultation to exchange comments and users can add their own stocks to observe and wait for the best time to buy and sell.

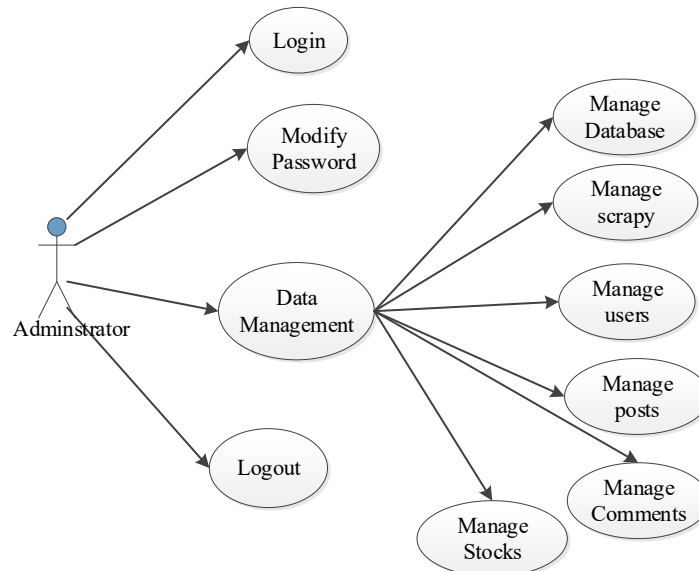
## 2. Requirement Analysis and Design

### 2.1. Requirement Analysis

This system is designed to provide personalized stock recommendation function based on data analysis results. The system is divided into two roles: shareholder user and administrator. Shareholders refer to users who use the securities information query system to obtain relevant data. The administrator is responsible for processing the data and communicating with shareholders. Through this platform, users can query all the market information and the trend of individual stocks, as well as timely understand the market information, such as: stock evaluation analysis, hot spots in the sector, individual stock ratings, etc., to provide investors with a good investment communication and analysis environment. Figure 1 and Figure 2 are the use case diagrams of administrator role and shareholder role respectively.



**Figure 1.** The use case diagram of shareholder



**Figure 2.** The use case diagram of administrator

### 2.2. System Designment

Through the analysis of system requirements, the main functions of this python based stock screening management system are divided into foreground module and background module. The background module is mainly for system administrators: home page, site, stock screening management, authentication and authorization. The foreground module is mainly for

shareholders: home page to view stock details, self selected shares, posts, user center and other functions.

Based on B/S architecture, the stock screening management system is developed and implemented using Django framework which is a Web application framework for building applications that interface with Web and database servers[5]. Figure 3 shows the overall architecture design of the system.

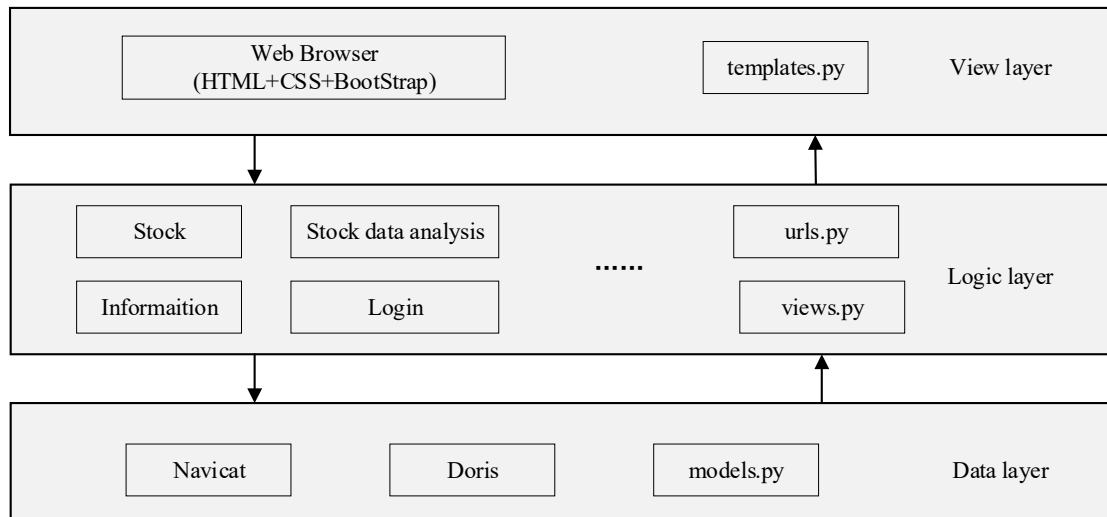


Figure 3. The system architecture diagram

The data layer uses Doris database to store and obtain the personal information, stock information, post information and comment information of shareholders. Doris is a Massively Parallel Processing (MPP) database, and it can provide millisecond query response performance for massive data [6]. The logic layer is the center of the whole system, which is mainly implemented by Python's Django framework. The logical layer will verify the request submitted by the user in the view layer, and then pass it to the data layer according to the type of request. The view layer is based on Bootstrap and combines HTML, CSS and JavaScript to develop and implement data transmission and application on the Web side. Echarts library is a declarative framework for rapid construction of web-based visualization [7], and it is used in the displaying various chart.

### 3. System Implementation

#### 3.1. Stock User Module

As shown in Figure 4, shareholder users first enter the registration page, and then enter the login page after completing the registration. The main functions of such users include four modules: information management of shareholders' accounts, stock market information module, stock self selection module and advisory forum module. User management includes user registration, user login, user information modification and personal information viewing. The stock market information module includes stock market inquiry and stock data statistics. The stock self selection module includes operations such as displaying various stock data information, adding and deleting stocks as self selected stocks, and analyzing individual stock trends. Consulting forum module, including browsing, posting, comment reply, deletion and other operations.

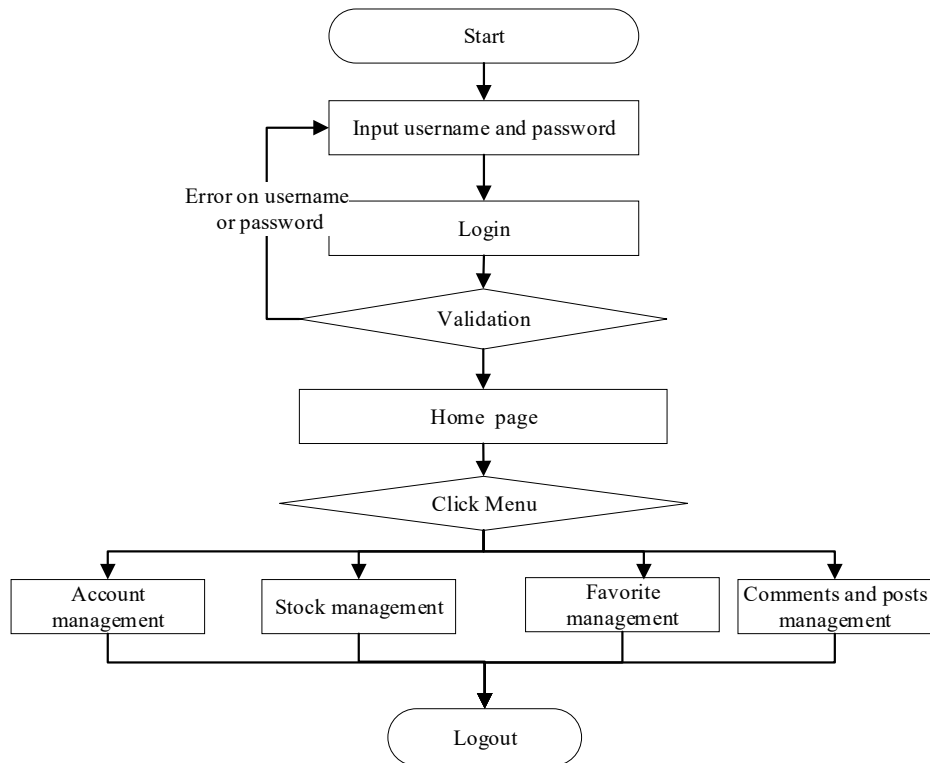


Figure 4. The system architecture diagram

After entering the home page, shareholders can intuitively understand the stock market situation of individual stocks and make preliminary judgment and summary through horizontal and vertical comparative analysis. The stock market is shown in Figure 5.

Stock Data Analysis System

Index Stock Favorite Account - Comments and posts

Search  Search Export

name	code	price	Increase and decrease	Ration	YTD	Turnover	Amount of Money	Turnover Rate	TTM	Dividend	Market Value	Update	Historical	Optional
*****	SH600011	6.94	-0.22	-3.07%	-28.38%	63981800.0	456926905.0	0.58%	-7.798	0.0%	108944767911.0	11/08/2022 14:56	View	Favorite
*****	SH600425	3.98	-0.26	-6.13%	5.01%	64001811.0	260852054.0	4.64%	14.561	4.0%	5487584542.0	11/08/2022 14:56	View	Favorite
*****	SH600448	3.99	-0.13	-3.16%	17.7%	64047483.0	256940795.0	10.17%	-42.505	0.0%	2512980451.0	11/08/2022 14:56	View	Favorite
*****	SH600036	38.89	-0.6	-1.52%	-20.16%	64099595.0	2514619971.0	0.31%	7.914	3.914%	980799795423.0	11/08/2022 14:56	View	Favorite
*****	SH600633	6.5	-0.39	-5.66%	-26.22%	65463004.0	447807475.0	5.17%	20.444	1.231%	8227248400.0	11/08/2022 14:56	View	Favorite
*****	SH600906	7.81	-0.22	-2.74%	-38.79%	66058651.0	530181655.0	5.19%	46.303	1.287%	25343450000.0	11/08/2022 14:56	View	Favorite
*****	SH600968	2.62	-0.08	-2.96%	-10.58%	66865852.0	178978190.0	3.59%	19.578	2.091%	26632573001.0	11/08/2022 14:56	View	Favorite
*****	SH601696	12.0	-0.63	-4.99%	-10.78%	67133593.0	824310246.0	4.62%	35.511	0.299%	33336000000.0	11/08/2022 14:56	View	Favorite
*****	SH600019	6.35	-0.13	-2.01%	-11.31%	67470638.0	433643014.0	0.3%	6.437	9.449%	141404413343.0	11/08/2022 14:56	View	Favorite
*****	SH601168	11.84	-0.56	-4.52%	-13.01%	67628460.0	825606350.0	2.84%	8.794	1.689%	28214720000.0	11/08/2022 14:56	View	Favorite

Pages : 2371 First Previous Next Last Current page : 1

Stock Data Analysis System

Figure 5. The stock list page

### 3.2. Administrator Module

The main functions of the system administrator include the management of shareholders' information, data information backup, forum post deletion and other operations. Administrators can add users, add stocks, add inquiries and comments, add administrators and cancel users. Shareholders can view the stock market, consult the forum, reply to comments, and screen stocks independently. Improve the manageability and security of user information through strict access authority system.

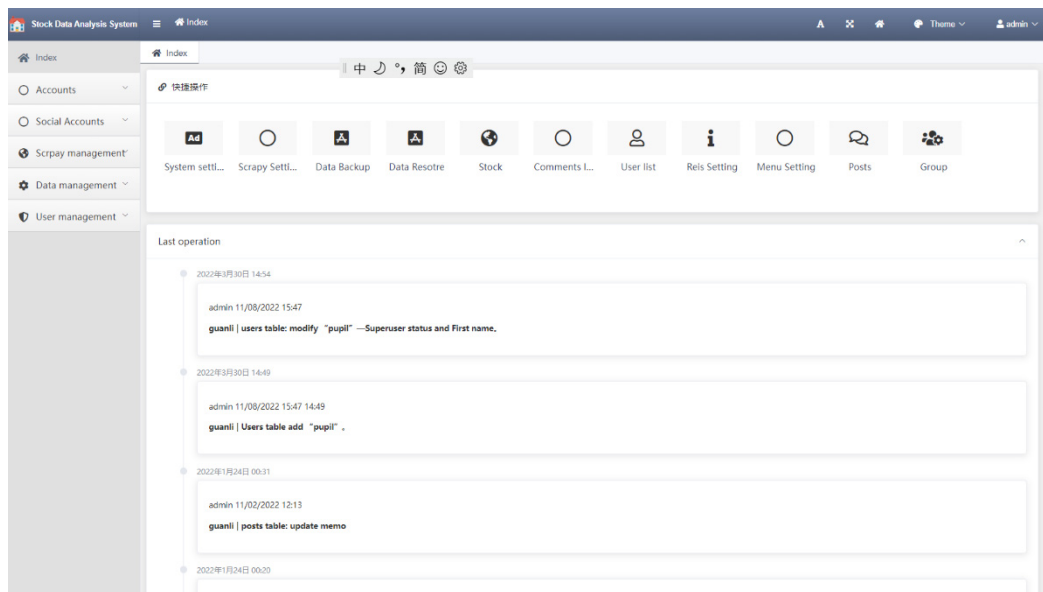


Figure 6. The administration home page

## 4. Conclusion

Based on the stock screening management system of Python, the development of this platform uses Python language, Django structure, and B/S architecture to display the data of the backstage server in the browser. Users can access the site only by opening the browser. The security and design functions and functions of this system meet the requirements of users.

## Acknowledgments

This work was financially supported by the funding of the big data collaborative innovation center of Jiangsu Maritime Institute, the young academic leaders of Jiangsu colleges and universities QingLan project, excellent teaching team of Jiangsu colleges and universities QingLan project (Innovative teaching team of software technology specialty).

## References

- [1] Nti, Isaac Kofi, Adebayo Felix Adekoya, and Benjamin Asubam Weyori. "A systematic review of fundamental and technical analysis of stock market predictions." *Artificial Intelligence Review* 53.4 (2020): 3007-3057.
- [2] Sprecher, Benjamin, et al. "Material intensity database for the Dutch building stock: Towards Big Data in material stock analysis." *Journal of Industrial Ecology* 26.1 (2022): 272-280.
- [3] Zhong huibin. "Design and Implementation of Stock Trading Management System Based on B/S Structure." South China University of Technology, 2016.

- [4] Li Ying. "Design and Implementation of the Stock System." Qingdao University of Science and Technology, 2018.
- [5] Burch, Carl. "Django, a web framework using python: Tutorial presentation." Journal of Computing Sciences in Colleges 25.5 (2010): 154-155.
- [6] Lv, Taizhi, Yongbing Chen, and Peiyi Tang. "Research on Data Analysis of The Vessel Shore Report." 2022: 114-120,2022.
- [7] Li, Deqing, et al. "ECharts: a declarative framework for rapid construction of web-based visualization." Visual Informatics 2.2 (2018): 136-146.