# 

**Requirements Specification Document**

The quantitative investment transaction management system of FOF



**Sep 7，2016**

目录

[1](#_Toc461557369)

[1. Introduction 6](#_Toc461557370)

[1.1 Purpose 6](#_Toc461557371)

[1.2 Document constraint 6](#_Toc461557372)

[1.3 Range 6](#_Toc461557373)

[1.4 References 6](#_Toc461557374)

[1.5 Revision 7](#_Toc461557375)

[2. Overall Description 7](#_Toc461557376)

[2.1 Commodity Prospect 7](#_Toc461557377)

[2.1.1 Background and opportunity 7](#_Toc461557378)

[2.1.2 Business requirements 8](#_Toc461557379)

[2.2 Commodity function 9](#_Toc461557380)

[2.3 User characteristics 10](#_Toc461557381)

[2.4 Constraint 10](#_Toc461557382)

[2.5 Hypothesis and dependence 10](#_Toc461557383)

[3. Detailed requirements description 11](#_Toc461557384)

[3.1 External interface requirements 11](#_Toc461557385)

[3.1.1 User Interface 11](#_Toc461557386)

[3.1.2 Hardware Interface 11](#_Toc461557387)

[3.1.3 Software Interface 11](#_Toc461557388)

[3.1.4 Communication interface 11](#_Toc461557389)

[3.2 Functional requirements 12](#_Toc461557390)

[3.2.1 Administrator and user login 12](#_Toc461557391)

[3.2.1.1 Characteristic description 12](#_Toc461557392)

[3.2.1.2 Related functional requirements 12](#_Toc461557393)

[3.2.2 User view all the fund market data 13](#_Toc461557394)

[3.2.2.1 The feature description 13](#_Toc461557395)

[3.2.2.2 Related functional requirements 14](#_Toc461557396)

[3.2.3 User to view a single fund specific data 15](#_Toc461557397)

[3.2.3.1 The feature description 15](#_Toc461557398)

[3.2.3.2 Related functional requirements 15](#_Toc461557399)

[3.2.4 用户新建FOF组合 16](#_Toc461557400)

[3.2.4.1 The feature description 16](#_Toc461557401)

[3.2.4.2 Related functional requirements 17](#_Toc461557402)

[3.2.5 User view FOF combination real-time monitoring data 17](#_Toc461557403)

[3.2.5.1 The feature description 17](#_Toc461557404)

[.2.5.2 Related functional requirements 18](#_Toc461557405)

[3.2.6 Users view FOF combination analysis of profit and loss data 19](#_Toc461557406)

[3.2.6.1 The feature description 19](#_Toc461557407)

[3.2.6.2 Related functional requirements 20](#_Toc461557408)

[3.2.7 用户查看FOF组合回报统计数据 21](#_Toc461557409)

[3.2.7.1 The feature description 21](#_Toc461557410)

[3.2.7.2 Related functional requirements 21](#_Toc461557411)

[3.2.8 User view FOF combination analysis of performance attribution data 22](#_Toc461557412)

[3.2.8.1 The feature description 22](#_Toc461557413)

[3.2.8.2 Related functional requirements 23](#_Toc461557414)

[3.2.9 User view FOF combination analysis of asset allocation data 23](#_Toc461557415)

[3.2.9.1 The feature description 23](#_Toc461557416)

[3.2.9.2 Related functional requirements 24](#_Toc461557417)

[3.2.10 User view FOF combination analysis of position changing data 24](#_Toc461557418)

[3.2.10.1 The feature description 24](#_Toc461557419)

[3.2.11 User view FOF combination analysis of Performance Evaluation data 25](#_Toc461557420)

[3.2.11.1 The feature description 25](#_Toc461557421)

[3.2.11.2 Related functional requirements 26](#_Toc461557422)

[3.2.12 User adjust the ratio condition of FOF combination 27](#_Toc461557423)

[3.2.12.1 The feature description 27](#_Toc461557424)

[3.2.12.2 Related functional requirements 27](#_Toc461557425)

[3.2.13 Users modify constant parameter information 28](#_Toc461557426)

[3.2.13.1 The feature description 28](#_Toc461557427)

[3.2.13.2 Related functional requirements 29](#_Toc461557428)

[3.2.14 Users view information risk control 30](#_Toc461557429)

[3.2.14.1 The feature description 30](#_Toc461557430)

[3.2.14.2 Related functional requirements 30](#_Toc461557431)

[3.2.15 User search for the fund 31](#_Toc461557432)

[3.2.15.1 The feature description 31](#_Toc461557433)

[3.2.15.2 Related functional requirements 31](#_Toc461557434)

[3.2.16 Administrator manage the account 32](#_Toc461557435)

[3.2.16.1 The feature description 32](#_Toc461557436)

[3.2.16.2 Related functional requirements 33](#_Toc461557437)

[3.2.17 Administrator views the system log 36](#_Toc461557438)

[3.2.17.1 The feature description 36](#_Toc461557439)

[3.2.17.2 Related functional requirements 36](#_Toc461557440)

[3.3 Non-functional requirements 36](#_Toc461557441)

[3.3.1 Performance requirements 36](#_Toc461557442)

[3.3.2 Security 36](#_Toc461557443)

[3.3.3 Usability 37](#_Toc461557444)

[3.3.4 Reliability 37](#_Toc461557445)

[3.3.5 Constraint 38](#_Toc461557446)

[3.4 Data requirements 38](#_Toc461557447)

[3.4.1 Definition of data 38](#_Toc461557448)

[3.4.2 Default data 38](#_Toc461557449)

[3.4.3 Data format requirements 38](#_Toc461557450)

[3.5 Other Requirement 39](#_Toc461557451)

[3.5.1 Requirement of install 39](#_Toc461557452)

# 1. Introduction

## 1.1 Purpose

This document describes the functional requirements of the FOF Quantitative transaction management system, a market making and portfolio management system for advanced derivatives. The software development team's realization and verification of the software system based on this. Unless stated, the requirements of this document are high priority needs.

## 1.2 Document constraint

Requirements in the document are divided into high,mediun and low priority.

## 1.3 Range

The quantitative investment transaction management system of FOF aims at providing fund portfolio investment transactions with strategy support, as well as risk assessment, and tips, which make it more effective to do transaction and risk management. The project can maximize returns by providing the users of our project`s system with the trend of funds, strategy `s parameters, risk control and a full range of services to help users manage assets effectively, also via main categories of assets determined by quantitative strategy and small classes of funds determined by quantitative method to choose equity funds or fixed income funds.

## 1.4 References

1）EEE Standard

2）Advanced Fof quantitative investment transaction management system demand Documents 0813

## 1.5 Revision

|  |  |
| --- | --- |
| time | version |
| Sep 7th,2016 | V1.0 |

# 2. Overall Description

## 2.1 Commodity Prospect

### 2.1.1 Background and opportunity

FOF, the abbreviation of Fund of Funds, refers specifically to invest in other funds, FOF does not directly invest in stocks or bonds, and only in the extent of other funds, indirectly through the holders of other securities investment funds to hold stocks, bonds and other assets. FOF is new kinds of funds, which is combined with Innovation of funds product and marketing channels. FOF filters the funds through professional methods and helps investors optimize investment performance. In addition, FOF has greater flexibility in choosing investment objective, in a depressed or volatile market environment, FOF `s advantages are more obvious.

The advantages of FOF :

(1) FOF is equal to invest lots of funds, reducing the choosing cost of investors, enrich the chances of investors of to select funds;

(2) FOF completely is constructed by legal form of funds and abided by operation mode of funds for operation; FOF contains the medium-and long-term investment strategy for fund`s market, as well as general funds, is a long-term investment of financial tool; (3) when we select single fund ,we will face difficulties, such as higher risk and cost. However, FOF, through investing the fund portfolio, actually to help investors buy "basket of fund”, and through experts reselect funds carefully, dramatically decreases the system risk of investing funds.

### 2.1.2 Business requirements

This project aims at bringing quantitative method in the selection of funds in FOF portfolio. According to the history data of funds, we can obtain each public fund`s rating and form fund pool. Secondly, we can use the market and correlative risk parameter to calculate the weights of equity funds and fixed income funds, construct FOF portfolio, show fund`s NPV and other market information to user by friendly interface, and provide FOF quantitative investment for systemic support.

The specific goals of this project are as follows:

Establishing an investment strategy database, informationizing the FOF investment. The project is designed with the index system of evaluating funds, regularly updating funds rankings, forming a fund pool, then combined with the strategy`s model, determining the fund portfolio, which efficiently and simply provides the users of FOF quantitative investment system for decision support, achieving FOF investment electronically.

Regularly monitoring the market, suggesting that risk, maximizing profit. According to market changes, the project`s system can periodically adjust fund pool and corresponding weights of each portfolio fund, meanwhile, set back line and stop line, which can tip risk and unusual products to users in a timely manner, achieving effectively control of risks.

Providing a full range of management system, users can customize FOF portfolio according to self-indexes. For the first time use, Users need to input the total asset index, risk parameters index and so on, then the system automatically generates FOF portfolio that meeting the requirements of users, and facilitates the transactions. The system also presents the user with position information, performance indicators, fund rating and other fund information, which makes it easy for users to view the market in time. In addition, the project also consists of system management and artificial adjustment function, namely, if market volatility is detected, the system automatically opens a position or increases position; if fund`s weight is negative, we can artificially set weights of 0, realizing the comprehensive management for FOF portfolio.

## 2.2 Commodity function

SF1：Inqure and combine the OTC fund

SF2：Automatic hedging transactions based on risk changes

SF3：Modified parameter model, dynamic adjustment of the hedging strategy

SF4：Dynamic management of customers, master customer transactions position Information and authority management

SF5：Dynamic view of the OTC fund

SF6：Dynamic view of the combination information

## 2.3 User characteristics

|  |  |
| --- | --- |
| ordinary user | The entire system has an unlimited number of ordinary users, ordinary users can register and log in, check the simple view of the operation and transaction. |
| Administrator/database adminstrator | The whole system has one database administrator and unlimited number of administrator, their job include monthly maintenance of server, user management, User CRUD, evaluate the operation of the system and modify the parameters of the model according to the evaluation results, to maximize revenue. |

## 2.4 Constraint

CON1: The system will run on the Window X operating system.

CON2: The system will use a graphics interface, nod the web interface.

CON3: The project will developed by continuous integration method.

CON4: In the develop cause, the developer should submit the software requirements documentation, design description document and test report

## 2.5 Hypothesis and dependence

AE1:Users must be the Fof professional manager.

# 3. Detailed requirements description

# 3.1 External interface requirements

### 3.1.1 User Interface

Details see Prototype Iterative Document .

### 3.1.2 Hardware Interface

None

### 3.1.3 Software Interface

None

### 3.1.4 Communication interface

The client and server communicate with RMI：

**CI1：**The main server will send data to the client witch connected to the server, including the following contents, the detailed contents can be found in data needs：

User account Information；

User combination information；

User position record；

Position record volatility information；

Parameter information；

**CI2：**The request from the client to the main server includes the following:

Login request；

Login user name and password；

Query request of each fund；

Query request of construct composite

Query request of combination information；

Query request of risk control information；

Query request of modifying parameter；

## 3.2 Functional requirements

### 3.2.1 Administrator and user login

### 3.2.1.1 Characteristic description

When normal user needs account, he can supply username and password to administrator. A normal user or administrator with account can login. Normal user and administrator are collectively called users.

Priority: low

Stimulus / response sequence

stimulus：user enter the username and password

response：system record the username and password

stimulus：user input login command

response：System verify the user's account id and password, display validation results

### 3.2.1.2 Related functional requirements

|  |  |
| --- | --- |
| User.Login | System allows users to login |
| User.Login.input | After user enter the username and password,system record them. |
| User.Login.Commit | User input login command, the system verifies the password, and returns the result |
| User.Login.yes | If user input right account id and password, system login success. |
| User.Login.invalid | If the user input an unknown account id, the system prompts password invalid. |
| User.Login.notFound | If the user input an exist account id with wrong password, the system prompts password error. |
| User.End | System allows users to end tasks |

### 3.2.2 User view all the fund market data

### 3.2.2.1 The feature description

When user need to check all the fund market data after verification, system should display all the fund market data.

Priority: medium priority

Stimulus/response sequence

Stimulus：User choose the type of fund market which he/she wants to check.

Response：System allows user choose the fund market type and records the choose information.

Stimulus：User choose the type of fund profit which he/she wants to check.

Response：System allows user choose the type of fund profit and records the choose information.

### 3.2.2.2 Related functional requirements

|  |  |
| --- | --- |
| User.Market | System allows user check the fund market data. |
| User.Market.ChooseMarketType | User chooses the market types which system contains(Fund Basis Type、Fund Market Type),system record the market type user choosed. |
| User.Market.ChooseProfitType | User choose the profit type(Stock Open-End Fund、Bond Open-End Fund、Mixed Open-End Fund、Principal Guaranteed Open-End Fund、Index Open-End Fund、Money Market Fund、QDII Fund、LOF Fund、ETF Fund、Equity Fund、Other Fund) of the fund he/she wants to check. The system records revenue categories to select information, and display the corresponding fund market information (Fund name, fund code, the current net value, per cent, recent one month gains, recent three months gains, recent half a year gains, recent one year gains, recent three years gains, recent five years gains, since the establishment of gains, annual income, net chart, earnings charts) |
| User.Market.End | System allows end users to view market mandate of the Fund. |

### 3.2.3 User to view a single fund specific data

### 3.2.3.1 The feature description

Users select a single fund needs to view, the system shows details of the Fund.

Priority：medium priority

Stimulus/response sequence

Stimulus： The user chooses to view brief information of the Fund want to see.

Response： The system gets user-selected information, shows the Fund's recent trend of net worth and income trends of the time, and in contrast to fund index and market index data.

Stimulus：Users select the Fund needs to view details

Response：The system gets user-selected information, show all detail data of the Fund.

### 3.2.3.2 Related functional requirements

|  |  |
| --- | --- |
| User.SingleFund | System allows user to choose which fund he/she wants to view. |
| User.SingleFund.ChooseSimple | User select the fund he/she wants to view |
| User.SingleFund.ExhibitionSimple | System shows the user the selected Fund trend and profit trend in recent days, and in contrast to fund index and market index data. |
| User.SingleFund.ChooseDetail | Users select a Fund, and view details. |
| User.SingleFund.ExhibitionDetail | System show user by selected Fund of detailed information (fund name, and fund code, and established date, and fund company, and fund manager, and established scale, and management fee, and investment type, and compared benchmark, and scale; returns rate index: recent one month, and recent three months, and recent six months, and near one year, and near three years, and near five years, and since established, and years of returns, returns rate index; rating information: Returns index e, and risk index R, and conditions index D, and Ranking indicator (RI=R\*E\*D), the number of rating stars; performance evaluation : return characteristics:Alpha, average yields, the geometric average rate of return, risk and return values; recent million image, asset allocation chart (heavily invested in bonds, heavily invested in equities, industry configuration) |
| User.SingleFund,End | System allows end users to view single branch the mandate of the Fund. |

### 3.2.4 用户新建FOF组合

### 3.2.4.1 The feature description

系统应允许用户按自身偏好构建基金组合，并给出该组合历史数据的回测结果。Priority：高

Stimulus/response sequence

Stimulus：用户输入构建组合命令

Response：系统允许用户构建基金组合，并允许用户选择基金策略及风险偏好

Stimulus：用户选择基金生成策略及风险偏好

Response：系统记录用户的选择，并生成对应的组合，并将组合信息展示给用户

Stimulus：用户选择继续生成组合

Response：系统展示所生成组合的历史数据回测数据

Stimulus：用户确认所生成的组合

Response：系统记录该组合，并显示生成组合成功

### 3.2.4.2 Related functional requirements

|  |  |
| --- | --- |
| User.Combination | 系统允许用户生成组合 |
| User.Combination.StrategyInput | 用户选择基金生成策略，系统记录用户策略选择 |
| User.Combination.RiskInput | 用户选择基金组合的风险偏好，系统记录用户风险偏好 |
| User.Combination.Produce | 系统根据用户策略及用户风险偏好生成对应组合 |
| User.Combination.Exihition | 系统将对应组合信息展示给用户 |
| User.Combination.Continue | 用户输入继续生成组合的命令，系统将生产组合的历史回测数据展示给用户 |
| User.Combination.Completed | 用户确认所生成的基金组合，系统记录生成的该组合。 |
| User.Combination.Cancel | 系统允许用户在生产组合过程中取消生成组合过程 |

### 3.2.5 User view FOF combination real-time monitoring data

### 3.2.5.1 The feature description

User can view the current fund market real time data, and view the details of a Fund.

Priority: high

Stimulus/response sequence

Stimulus : Users choose real-time monitoring data performance benchmarks.

Response : Shows the performance benchmarks market under the Fund's real-time data

Stimulus : Users select a fund to view the details of the Fund.

Response :System records the user selects funds and show detailed data of the Fund

Stimulus : Users can choose to display data rehabilitation process, select the length of time and cycles

Response : The System show data based on user-selected to the user.

### .2.5.2 Related functional requirements

|  |  |
| --- | --- |
| User.Monitor | Real-time information system allows the user to view the Fund market |
| User.Monitor.DatumInput | Users select the performance benchmark that needs to view data (Fund Index of Shanghai composition, Fund Index of Shenzhen composition、 Fund300) , The system shows corresponding data (Including funds, fund name, update the code date and predict change, forecasting price, forecast, position number, position of net cost market value, position, date of latest weight, profit/loss, floating profit and loss rate, cumulative profits and losses, the total floating profit/loss rate, the realized profit and loss) to the user. |
| User.Monitor.FundDetail | Users select a Fund, the system shows the net value of the Fund performance data (NET line, containing the Fund benchmarks and Fund 300 two baselines) |
| User.Monitor.DataType | Data system allows the user to select the desired view type(Rehabilitation, units, cumulative) And display data |
| User.Monitor.DateRange | System allows users to select the time range displayed data(One month, three months, six months, one year, three years, five years and so far this year, the establishment date) And display data |
| User.Monitor.DateUnitType | System allows the user to select Statistical period (day, week, month, quarter, year) And display data |
| User.Monitor.End | System allows the user to exit monitoring |

### 3.2.6 Users view FOF combination analysis of profit and loss data

### 3.2.6.1 The feature description

Users will need to view the construction of the combined profit and loss information, the system should show the building fund portfolio profit and loss information.

Priority: high

Stimulus/response sequence

Stimulus : Users select profit and loss analysis of performance benchmarks that show data.

Response : Shows the performance benchmarks under the build a fund portfolio profit and loss information, and allows the user to select the starting and ending times.

Stimulus : Users select the view information the start date and due date

Response : System records the start date and due date selected by the user, and display the corresponding time period information

### 3.2.6.2 Related functional requirements

|  |  |
| --- | --- |
| User.ProfitLoss | System should allow users to view the construction of the combined profit and loss information |
| User.ProfitLoss.DatumInput | Users select the baseline information (Shanghai Stock Exchange Fund index, Shanghai composite Index, Fund 300 ) , System shows corresponding profit and loss information (including total returns, and relative total returns, and maximum gains, and maximum gains days, and maximum gains recovery during, and years of average returns, and years of average excess returns, and down risk, and years of fluctuations rate, and track errors, and related coefficient, and Alpha, and Btea, and Sharpe, and reynor, and ensen, and R2, and half variance, and Sortion equivalent of recently 3 months, and recently 6 months, and since this year,and select period and The 4 phases of the different values of the selection range, range refers to the user set the start date and end date for the time range between) |
| User.ProfitLoss.DateChoose | User to select a time range to view profit and loss information(User-selected view the start date, end date) , The system updates all values under the corresponding selection |
| User.ProfitLoss.End | The task system allows users to end the task of analysis of profit and loss information. |

### 3.2.7 用户查看FOF组合回报统计数据

### 3.2.7.1 The feature description

系统应该允许用户查看所构建组合的回报统计数据。Priority：高

Stimulus/response sequence

Stimulus：用户输入查看回报统计信息

Response：系统展示用户所构建组合的回报统计信息，并允许用户选择日期、业绩基准

Stimulus：用户选择需要查看的业绩基准

Response：系统展示对应业绩基准的回报统计数据

Stimulus：用户选择需要查看的回报统计的时间范围

Response：系统展示对应时间段的回报统计信息

Stimulus：用户选择需要查看的回报统计的统计周期

Response：系统展示对应统计周期的回报统计信息

### 3.2.7.2 Related functional requirements

|  |  |
| --- | --- |
| User.Return | 系统应允许用户查看所构建组合的回报统计信息 |
| User.Return.DatumInput | 用户选择需要查看的回报统计信息的业绩基准（上证基金指数、上证综指、沪深300），系统展示对应的统计回报信息（包括回报统计图；相对上涨、相对下跌、平盘、合计、周期数、百分比、平均值、标准偏差、最大序列、平均序列；相对回报、组合回报、基准回报、发生日期、涨幅第一、涨幅第二、涨幅第三） |
| User.Return.TimeCycle | 用户选择需要查看的回报统计信息的统计周期（日、周、月、季度、年），系统按照用户选择更新展示数据 |
| User.Return.DateRange | 用户选择查看的回报统计信息的开始日期和截止日期，系统按照用户选择更新展示数据 |
| User.Return.End | 系统允许用户结束查看统计回报信息任务 |

### 3.2.8 User view FOF combination analysis of performance attribution data

### 3.2.8.1 The feature description

After setting up a fof combination, an user can start view the data of performance attribution after verification.

Priority：high

Stimulus/response sequence

Stimulus： user ask for viewing the panel of performance attribution

Response：system enters the panel of performance attribution

Stimulus：user choices the start date、end date and asset type.

Response：system shows all fund data of the selected type from the start date to the end date.

### 3.2.8.2 Related functional requirements

|  |  |
| --- | --- |
| User.PerformanceAttribution.Input  User.PerformanceAttribution.Input.Show | System allows users to type in.  If user ask for viewing the data of performance attribution, system shows the data of it, for more details refers to User.PerformanceAttribution.Input.Show.Change |
| User.PerformanceAttribution.Input.Show.Change | If user input the start date、end date and asset type, system shows the following information(Maximum sequence, standard deviation, number of cycles, the sequence, averages, percentages, falling relative value relative value, flat plate, aggregate values, relative returns, fund returns, the occurrence date) |

### 3.2.9 User view FOF combination analysis of asset allocation data

### 3.2.9.1 The feature description

After setting up a fof combination, an user can start view the data of asset allocation after verification.

Priority：high

Stimulus/response sequence

Stimulus： user ask for viewing the panel of asset allocation

Response：system enters the panel of asset allocation and shows the fund chart.

Stimulus：user choices net rights unit、display unit and period.

Response：system shows the line chart about fund net of equity fund.

### 3.2.9.2 Related functional requirements

|  |  |
| --- | --- |
| User.AssetAllocation.Input  User.AssetAllocation.Input.Show | System allows users to type in.  If user ask for viewing the data of asset allocation, system shows the data of it, including the code of the fund、YTD、rewards of 3rd、6th、1 year、2 year、3 year、5 year、total rewords and annualized return, for more details refers to User.AssetAllocation.Input.Show.Change |
| User.AssetAllocation.Input.Show.Change | If user ask for choicing the net rights unit or display unit,system shows the line chart about fund net of it. |

### 3.2.10 User view FOF combination analysis of position alteration data

### 3.2.10.1 The feature description

After setting up a fof combination, an user can start view the data of position alteration after verification.

Priority：high

Stimulus/response sequence

Stimulus：user ask for viewing the panel of position alteration

Response：system enters the panel of position alteration.

Stimulus：user ask for viewing the data of position alteration

Response：system shows the table of position alteration.

3.2.10.2 Related functional requirements

|  |  |
| --- | --- |
| User.ChangePosition.Input  User.ChangePosition.Input.Show | System allows user to type in.  If user ask for viewing the data of position alteration, system shows the data of it, including th operation date, warehouse adjustment date, security code, the securities referred to buy quantity, price, quantity sold, selling price） |

### 3.2.11 User view FOF combination analysis of Performance Evaluation data

### 3.2.11.1 The feature description

After setting up a fof combination, an user can start view the data of performance evaluation after verification.

Priority：high

Stimulus/response sequence

Stimulus：user ask for viewing the panel of performance evaluation.

Response：system enters the panel of performance evaluation.

Stimulus：user ask for viewing the data of risk premium.

Response：system shows the data table of risk premium.

Stimulus：user ask for viewing the data of investing style analysis.

Response：system shows the data table of investing style analysis.

### 3.2.11.2 Related functional requirements

|  |  |
| --- | --- |
| User.PerformanceEvaluation.Input  User.PerformanceEvaluatio.Input.Show | System allows users to type.  If users ask for viewing the data of position changing, system shows the data of it, for more details refers to User. PerformanceEvaluation.Show |
| User.PerformanceEvaluation.Show.RiskPremium  User.PerformanceEvaluation.Show.InvestmentStyle | If users ask for viewing the data of risk premium, system shows the data of it, including stock code, stock short,Alpha ,Beta ,Sharpe,Treynor ,Jensen , average yields and average yield, standard deviation of returns, standard deviation of returns, investment types, managers.  If users ask for viewing the data of investing style analysis, system shows the data of it, including bonds code, bonds referred to, investment style, average positions time, holding earnings, holding stock net rate, Qian 10stock accounted for than, Qian 3 industry accounted for than, Qian 5 industry accounted for than, Qian 10industry accounted for than, investment type, management company |

### 3.2.12 User adjust the ratio condition of FOF combination

### 3.2.12.1 The feature description

After setting up a fof combination, an user can start adjust the position condition after after verification.

Priority：high

Stimulus/response sequence

Stimulus: user ask for adjusting the position condition.

Response：system enters the panel of position condition adjustment and shows the current state of position.

Stimulus：user ask for submitting the modification of position data.

Response：system save the new data and update.

### 3.2.12.2 Related functional requirements

|  |  |
| --- | --- |
| User.BookAdjusting.Input  User.BookAdjusting.Input.Show  User.BookAdjusting.Input.Submit | System allows user to type in.  If users ask for viewing the data of position changing, system shows the current data of it.  If users ask for submitting the new data of position changing, system save the new data and update the database. |

### 3.2.13 Users modify constant parameter information

### 3.2.13.1 The feature description

System should allow users to adjust some parameters of the system.

Priority : high

Stimulus/response sequence

Stimulus : User input change parameter command

Response : The system should show the parameter which the user can modify, and modify interface.

Stimulus : The user modifies the SSE fund index stable value

Response :System verifies the user input. If input is correct, system records user-modified SSE fund index stable value. Otherwise, system prompts this to user.

Stimulus : Users from modifying system of value-at-risk (including moderate risk and high value-at-risk)

Response: :System verifies the user input. If input is correct, system records the value-at-risk. Otherwise, system prompts this to user.

Stimulus : Users from modifying system risk-free interest rate

Response : :System verifies the user input. If input is correct, system records the risk-free interest rate. Otherwise, system prompts this to user.Stimulus : Users from modifying system risk-free interest rate

Response : :System verifies the user input. Risk-free interest rate after the system records user

Stimulus : The user modify the holding period of the system, the window period is the time period

Response : :System verifies the user input. If input is correct, system records the holding period of the system and the window period. Otherwise, system prompts this to user.

### 3.2.13.2 Related functional requirements

|  |  |
| --- | --- |
| User.ParameterChange | System should allow the user to modify some parameters of the system to show the current parameter value, and modify the interface |
| User.ParameterChange.SSEFundIndexStable | SSE fund index stable value entered by the user, the system verifies it and records the SSE fund index stable value user input |
| User.ParameterChange.RiskValue | User input required value-at-risk (high risk or low risk value), the system verify it and records user input value-at-risk |
| User.ParameterChange.NoRiskProfitRatio | User input required for the risk-free interest rate, the system verify it and records user input of the risk-free interest rate |
| User.ParameterChange.DateRange | Users enter the desired time period (window or hold period), the system verify it and records user-input time period |
| User.ParameterChange.End | In any of the above steps, the system allows the user to exit the parameters modification tasks |

### 3.2.14 Users view information risk control

### 3.2.14.1 The feature description

Risk control system should allow users to view control information.

Stimulus/response sequence

Stimulus : See the risk control command entered by the user

Response : System shows recently risk control information

Stimulus : Users select a recent time to view details

Response : System shows user-selected risk control shows more information (such as historical yield closing line, historical profit ratio line chart)

### 3.2.14.2 Related functional requirements

|  |  |
| --- | --- |
| User.RiskControl | System should allow users to view the system risk control information |
| User.RiskControl.Enter | Users choose to view system risk control information, system shows the most recent period of risk control information Entries (including Date, net worth, total return and risk information) |
| User.RiskControl.ChooseItem | Users select the risk control item which they want to see,system shows entry risk controls for more information (including historical price line, and historical profit ratio line chart) |

### 3.2.15 User search for the fund

### 3.2.15.1 The feature description

If user wants to search for a fund, he can do the search after verification.

Priority：mediun

Stimulus/response sequence

Stimulus：user inputs the code or name of the fund.

Response：system shows the list related to it.

Stimulus：A specific funding request from the user and enter complete information

Response：system enters the fund panel.

Stimulus：A specific funding request from the user and enter incomplete information

Response：system display the error.

### 3.2.15.2 Related functional requirements

|  |  |
| --- | --- |
| User.Search.Input  User.Search.Input.key | System allows the user to type in.  If user asks for inputting the fund code, system shows the related list, for more details，according to User.Search.Key |
| User.Search.Key.invaild  User.Search.Key.vaild | If user inputs the code or name of a fund but incomplete,system displays the error tip.  If user inputs the complete code or name of a fund, system shows the panel of the fund. |

### 3.2.16 Administrator manage the account

### 3.2.16.1 The feature description

Administrator should be allowed to add 、delete、mofity account information and search for an account after verification.

Priority：Medium

Stimulus/response sequence

1.0 Add account

Stimulus：Administrator inputs the user’s username,name,password,identity and ensure.

Response：System shows the success information and save the information.

Stimulus：Administrator inputs the exist username.

Response：System shows the username is exist.

2.0 Delete account

Stimulus：Administrator selects the user that whats to delete and make sure.

Response：System shows the modified successfully and save the changes.

3.0 Modify information

Stimulus：Administrator changes a user message, and ensure.

Response：System shows modified successfully and save the change.

4.0 Search account

Stimulus：Administrator enter the account management interface.

Response： System shows the user information.

### 3.2.16.2 Related functional requirements

|  |  |
| --- | --- |
| Administrator.Account.Input  Administrator.Account.Input.Add  Administrator.Account.Input.Delete  Administrator.Account.Input.Modify  Administrator.Account.Input.search | System allows the administrator to input.  If an administrator asks for adding an new user, system should save the information,for more details ,according to Administrator.Account.Add  If an administrator asks for deleteing an user, system should delete the information,for more details ,according to Administrator.Account.Delete  If an administrator asks for modifing an user’s information, system should save the information, for more details ,according to Administrator.Account.Modify  If an administrator asks for searching an user and input the key, system should search for the user and show the user, for more details ,according to Administrator.Account.Search |
| Administrator.Account.Add.start  Administrator.Account.Add.valid  Administrator.Account.Add.invalid  Administrator.Account.Add.cancel | If an administrator asks for adding an new user, system should save the information, including username,name,password and identity.  If an administrator asks for adding an new user and the form is correct ,system saves the user and update the database.  If an administrator asks for adding an new user but the form is incorrect or uncomplete, system shows the incorrect tip.  If an administrator asks for adding an new user but canel on the halfway, system would not save anything. |
| Administrator.Account.Delete.start | If an administrator asks for deleting an user, system deletes the user and update the database. |
| Administrator.Account.Modify.start  Administrator.Account.Modify.valid  Administrator.Account.Modify.invalid  Administrator.Account.Modify.cancel | If an administrator asks for modifying an user’s information and ensure, system saves the changes and update the database.  If an administrator asks for modifying an user’s information without misatake, system saves the changes and update the database.  If an administrator asks for modifying an user’s information but the information is not correct or the username is exist, system shows the mistake and refuses the subminttion.  If an administrator asks for modifying an user’s information but not ensure, system would not same the changes. |
| Administrator.Account.Search | If administrator inputs some keys and ask for searching, system should showsthe related users. |

### 3.2.17 Administrator views the system log

### 3.2.17.1 The feature description

System should allow the administrator to view the system log after verification.

Priority：中

Stimulus/response sequence

Stimulus：administrator asks for viewing the system log.

Response：system shows the panel of it.

### 3.2.17.2 Related functional requirements

|  |  |
| --- | --- |
| Administrator.System\_log.Input  Administrator.System\_log.Show | System allows the administrator to type in.  If administrator asks for viewing the system log, system shows the log. |

## 3.3 Non-functional requirements

### 3.3.1 Performance requirements

The system has high requirements for performance, mainly as follows:

1. Hedge it immediately when discover the value of the risk is beyond the threshold; 2. Refresh data every day.

### 3.3.2 Security

Safety1: system should only allow users with authentication and authorization to access

Safety2: system should verify the user's access rights in accordance with the user's identity

Safety3: system has a default administrator account, the account value allows administrators to change password

Safety4: different users have different rights in the system, and they should be managed respectively

Safety5: both the user from client and administrator from server will not be allowed to access the algorithm of this system so as to avoid the core technology from being destroyed by user’s error operation, thus can ensure the security of the system operation.

### 3.3.3 Usability

Usability1: all query operations can be done in 3 clicks.

Usability2: common operations have their fast keys.

### 3.3.4 Reliability

Reliability6: during the client and server communication, the system will not fail even if the network fails

Reliability6.1: client should detect the fault, and try to re-connect the network 3 times, each time 15 seconds

Reliability 6.1.1: the client should continue to work after reconnection; Reliability 6.1.2: if the connection fails again, the client should wait for 5 minutes and try again.

Reliability6.1.2.1: after re-connection, the client should continue the work before the failure.

### 3.3.5 Constraint

IC1: System is distributed on the network as a server and multiple clients.

IC2: Multiple clients can access server in parallel.

## 3.4 Data requirements

### 3.4.1 Definition of data

See also ***Data Structure File***

### 3.4.2 Default data

Default for the following：

1. The time of changing the strategy parameter of fund combination is 15:00.
2. All the stock code and fund code of the system are true codes in stock change.
3. All the raw data is from Wind. If there are any differences between the system data and stock exchange data, please take the stock exchange data as standard.
4. Quote change data must keep the first two digits after the decimal point. If other data has decimals, please keep the first four digits after the decimal point.

### 3.4.3 Data format requirements

Format1**：**Date data format must be：yyyy-mm-dd；

Time data format must be :yyyy-mm-dd HH:mm:ss ;

Format2**：**The type of number must be：Positive integer。

Format3：Stock code and fund code must be six number.Besides,they can include two letters to show the stock exchange.

## 3.5 Other Requirement

### 3.5.1 Requirement of install

OR1：When the system is istalled,it needs to be added initial user accounts。

OR2：The users who want to use the system must accept system train at least three days。

OR3 : The system needs professional persons to be installed and be set parameter.

OR4：Professional technical staff must maintain the system once a month.